Graduate Program Review
2009-2014

Plant and Soil Science

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College of
Agricultural Sciences and Natural Resources

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PROGRAM REVIEW OUTLINE
Department of Plant and Soil Sciences

I. Program Overview – A one to two-page summary of department’s vision and goals.  pg. 5

II. Graduate Curricula and Degree Programs  pg. 8
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   B. Number and types of degrees awarded
      - Degrees Awarded – Academic Year (chart & table)
      - Comparison of Degrees Awarded – FY Year (Peer info table)
   C. Low Performing Programs
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      - Department Semester Credit Hours – Academic Year (chart & table)
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   E. Number of majors in the department
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      - Comparison of Enrollment – Fall Data (Peer info table)
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      - Course Enrollments by Academic Year (table)
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III. Faculty  pg. 36
   A. Number, rank and demographics of the faculty (tenured and tenure track), GPTI’s and TA’s
      - Teaching Resources (chart and table)
      - Tenured and Tenure-Track by Rank - Fall Data (chart and table)
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   B. List of Faculty Members (table)
   C. Summary of the number of refereed publications and creative activities (table)
   D. Responsibilities and leadership in professional societies
      - Professional Leadership (table)
      - Student Committee Service (table)
   E. Assess average faculty productivity for Fall semesters only (use discipline appropriate criteria to determine)
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      - College SCH/FTE – Fall Data (chart & table)
IV. **Graduate Students**

A. Applicants and enrolled students
   - Graduate Student Summary by Category – AY (chart and table)
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C. GPA of new students
   - New Graduate Students GPA by Level – Fall Data (chart and table)

D. Time to Degree in Years (chart and table)

E. Provide a breakdown of how many enrolled graduate students are RA’s, TA’s, GA’s or GPTI’s (table)

F. Number of students who have received fellowships, scholarships and other awards - fellowships awarded (table)
   - Graduate School Scholarships and Fellowships
   - National, University, Departmental and Local Scholarships and Fellowships

G. Initial position and place of employment of graduates over the past 6 years (table)

H. Percentage (%) of full time students receiving financial support

I. Graduate Student Publications and Creative Activities (table) – number of discipline-related refereed papers/publication, juried creative/performance accomplishments, book chapters, books, and external presentations per year per student. (Note: this may overlap with faculty publications)

J. Programs for mentoring and professional preparation of graduate students.

K. Department efforts to retain students and graduation rates

L. Percentage of Full-Time and Part Time students per year by level – Fall data

V. **Department**

A. Department operating expenses
   - Department Operating Cost as a Fraction of Employees - (table)

B. Summary of Proposals (Submitted)
   - Summary of Number of Proposals Written (table)
   - Summary of Number of Proposals Accepted (table)

C. External Research
   - Summary of Faculty Awards (table)
   - Research Expenditures (chart & table)
   - Peer Institution Info (table)

D. Internal Funding
   - Source of Internal Funds (TTU) - (table)

E. Scholarships and Endowments (table)

F. Departmental resources for research and teaching (i.e. classroom space, lab facilities) - (table)

G. HEAF expenditures (table)
H. External Program Accreditation – Name of body and date of last program accreditation review including description of body and accreditation specifics.
I. Centers or Institutes

VI. Conclusions – a one- to two-page summary of the observed deficiencies and needs identified by your review. Highlight areas of greatest need and areas of significant contributions.

VII. Appendices – should include, but not be limited to, the following:

Table of Contents
A. Strategic plan
   - Attachment from Strategic Planning website
B. Curriculum Map (table)
C. 18 Characteristics
D. Graduate Course Offerings (table)
E. Graduate Student Handbook
F. Graduate Student Association(s) – Description and Information
G. Graduate Faculty 6-Year Resumes (obtained from digital measures)
H. GRE Revised General Test Scores
I. Unit Assessment Report from TRACDAT
J. Courses cross listed (TANDEM)
K. Recruiting Plan for the Academic Year 2014-2015
L. PSS Advisory Committees
I. **Program Overview** – A one to two-page summary of department’s vision and goals.

**Mission and Vision**

The Plant and Soil Science (PSS) Department is a leading academic department in the College of Agricultural Sciences and Natural Resources (CASNR) at Texas Tech University. Our mission is to improve plants for human use, increase knowledge about our environment, and enhance sustainable practices in plant production and value-added processing through education, research, and outreach. Our vision is that our Department will be recognized as one of the top 20 academic Plant and Soil Science departments in the nation. The Department’s reputation and integrity will be based on excellence in teaching, research and engagement related to current and emerging aspects of plant and soil sciences.

**Strategic Goals**

The department completed a new strategic plan in 2011, in which we set goals for 2015. The full strategic plan can be found on our website (http://www.pssc.ttu.edu/strategicplan/PSSStrategicPlan.pdf). Briefly, our major goals are to 1) increase undergraduate enrollment to 174 students by 2015 (outcome: 149 Fall 2015), 2) increase graduate enrollment to 125 students by 2015 (outcome: 87 Fall 2015), 3) secure $8 million annually in competitive research funding (outcome: $7.9 million in calendar year 2014; a +53.5% increase since 2009), and 4) secure $1 million annually to improve research equipment and facilities (outcome: new Bayer Plant Science building $15 million).

Our Department is committed to a goal of increasing undergraduate enrollment to 174 students as soon as possible. We have substantially increased our undergraduate enrollment from 125 in fall 2014 to 149 in fall 2015 (+19%). This is probably due to the very comprehensive recruitment enhancement strategy we defined in the fall of 2014. Our strategies to achieve this goal include but are not limited to:

- Increase awareness of PSS and graduate programs with specific events and groups (expo fair/vendor booths, attend American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America conferences, State and national FFA conventions, state 4-H round-up, etc. and have an expo booth displaying graduate programs).

- Encourage faculty and current graduate students to apply for awards, grants, and travel to conferences to represent the department.

- Encourage faculty research presentation at regional and national conferences to aid in department and graduate program recognition.

- Support and enhance programs of the Plant and Soil Science Graduate Student Council.

- Maintain an accurate and visually appealing website.

- Create and distribute a quarterly department newsletter.

- Create, display, and maintain a graduate program promotional brochure.

Plant and Soil Sciences
We are committed to growing our graduate programs to 125 students as soon as possible. Our graduate enrollment increased from 65 in 2007 to 103 in 2011 (+58%). Unfortunately, the economic crisis in 2011 had a large impact on our graduate enrollment (drop from 103 in 2011 to 88 in 2012). From 2012 to today, we saw a significant increase in the number of Ph.D. students (from 28 to 44: +57%) but a significant decrease in MS students (from 60 to 43: -28%). It resulted in a constant number of graduate students from 2012 to 2015 (88). Graduate students enrollment is largely a function of the funding available for teaching and research assistantships and enrollment in distance graduate degree programs. Thus, one of our goals is to keep increasing our research funding (external competitive funding, grants/gifts from commodity groups and private industry, etc.). Our department is consistently among the top five departments at Texas Tech in research funding.

Trends in Graduate Programs

In the fall of 2009, the name of our Ph.D. program changed from “Agronomy” to “Plant and Soil Science”. The new name was chosen to reflect the disciplinary diversity of the department. We created five emphasis areas within the Ph.D. in Plant and Soil Science (Crop Protection, Crop Science, Fibers and Biopolymers, Horticulture, and Soil Science). The next step was to create a new unified M.S. degree within the Department of Plant and Soil Science. Our new M.S. degree in Plant and Soil Science was approved in the spring of 2013. The areas of emphasis for this new program are Crop Protection, Crop Science, Fibers and Biopolymers, and Soil Science. We kept our MS in Horticulture Science separate because of the very specific population this degree is targeting. The new M.S. in PSS degree provides flexibility that the three previous MS degrees did not have. It also makes it possible for the department to adapt to emerging technologies in the future without having to create a new MS degree to house them. The overall objectives are to 1) streamline departmental degree offerings, 2) create an M.S. degree with the same name as both the department and the Ph.D. program, and 3) create a program that better fits current course and program offerings. In addition, aligning the name of the M.S. degree program with the Ph.D. program better communicates the nature of our graduate program offerings. Finally in the spring of 2013, the consolidation of our B.S. programs was approved. Our new B.S. name is B.S. in Plant and Soil Science and has five areas of specialization [Crop Science, Horticulture and Turfgrass, Soil and Water, Viticulture and Enology, and Horticulture (offered online)].

Distance degree programs, graduate and undergraduate, are an important part of our student enrollment. Currently, 27.5% of our students are enrolled in our B.S. at a distance and 17.2% in our graduate programs at a distance. We are committed to the continued growth of distance programs but the competition with other Universities is much fiercer than a few years ago. In particular, there is a need to develop a new promotional strategy of our distance education offering at the University level.

Faculty

The Department has approximately 18 faculty FTE in 2014, but these FTE employ about 30 individual faculty members who are Graduate Faculty. This is accomplished with joint appointments of a significant number of our faculty with agencies of the Texas A&M system, i.e., Texas A&M AgriLife Research and Texas A&M AgriLife Extension. This arrangement allows us to leverage our faculty salary dollars and provide a broader base of faculty expertise that would not be possible without these joint appointments. The typical joint appointment is either 75% TTU and 25% TAMU or 25% TTU and 75% TAMU.
Lubbock is home to a major concentration of agricultural and natural resource scientists. In addition to Texas Tech University and the Texas A&M AgriLife Research and Extension Center (the largest in the Texas A&M system), the USDA-ARS Cropping Systems Research Laboratory is located in Lubbock. Partnerships with these agencies have played an important role in the development of our Department and graduate programs. Many scientists from these agencies are adjunct faculty in PSS; several are Graduate Faculty and currently serve on graduate committees. In addition, we have adjunct faculty from leading companies in allied industries and federal agencies (e.g. Bayer CropScience, Monsanto, USDA-NRCS, etc.). The growing number of adjunct faculty affiliated with PSS enriches the graduate experience for our students and promotes multidisciplinary research.

Facilities

The Department of Plant and Soil Science is housed in five separate buildings on the TTU campus. The largest concentration of space and our main offices are located in the Bayer Plant Science building and its new wing (the older part of the building that was constructed in 1960). A greenhouse facility used for research and teaching, equipped with 14,000 square feet of assignable space, plus growth chambers and classrooms, is also located on campus. In addition, the Fiber and Biopolymer Research Institute is housed in a facility located 6.5 miles east of the TTU campus. The department operates the 130-acre Quaker Avenue Research Farm and its satellite next to the FBRI. This facility is used for both research and teaching. More than 50% of the farm is equipped with subsurface drip irrigation. The farm also houses a new 2,000 square foot state-of-the-art greenhouse used for research on transgenic crops. Most faculty with minority TTU joint appointments, and their graduate students, have an office on campus in addition to their offices and research space at the Texas AgriLife Research and Extension Center.
II. Graduate Curricula and Degree Programs

A. Scope of programs within the department

The Department of Plant and Soil Science (PSS) is a very diverse department. We have 26 graduate faculty and 5 instructors. We can group our faculty in five different areas, i.e., Crop Science, Horticulture Science, Plant Protection, Soil Science, and Fibers and Biopolymers. We have 8 Crop Science (including one that will begin on 01/01/2016), 10 Horticulture Science (including 2 full time instructors and 3 part time instructors), 3 Plant Protection, 6 Soil Science, and 5 Fibers and Biopolymers faculty members. The current status of the Department results from a long evolution. The department was first an Agronomy department having only crops and soils faculty. Horticulture was added in the 1970’s, followed by the addition of the former Entomology Department and most recently the Fiber and Biopolymer Research Institute (FBRI). The department evolved in a scientific environment that drastically changed over the years (DNA sequencing, high-throughput phenotyping, etc. to name a few). Therefore, our course offerings also evolved, especially in the arena of biotechnology/genomics and fibers and biopolymer. As our department changed, so did the composition of the faculty. With Crops, Horticulture, Plant Protection, Soils, and Fibers and Biopolymers faculty members, this is a unique, research-intensive department.

The PSS Department offers four graduate certificates (GCert), two Master of Science (MS) degrees, and one Doctor of Philosophy (PhD) degree.

The purpose for offering graduate certificates (GCert) is to meet the supplemental education needs of professionals. As jobs and job-related responsibilities change, a person often needs additional training in a specific area. It is also used by some as a pathway to our MS programs. A graduate certificate program is a set of courses that provides in-depth knowledge in one subject matter. The knowledge in the set of courses should provide a coherent knowledge base. We offer graduate certificates in: Crop Protection, Fibers and Biopolymers, Horticultural Landscape Management, and Soil Management. These certificates are offered both on-campus and at-a-distance.

The Department also offers Master of Science (MS) degrees in: (1) Plant and Soil Science and (2) Horticulture. Master of Science degree students in Plant and Soil Science or Horticulture may pursue either a non-thesis or a thesis option. These degrees are offered both on campus and at-a-distance. For the non-thesis option (36 hours of graduate course work) an oral comprehensive exam is required during the semester of graduation. The thesis option (18 hours of formal graduate course work plus six hours of research and six hours of thesis) is designed for most on-campus students while, in general, most distance students pursue the non-thesis option. Exceptions to this are possible if very strict criteria are met (access to research facilities and mentoring locally). An oral exam over the research project is required for the thesis option.

The PSS Department offers the Doctor of Philosophy (PhD) degree in Plant and Soil Science, with the following specialization areas: Crop Protection, Crop Science, Fibers and Biopolymers, Horticulture, and Soil Science. A PhD candidate in the department is required to take written and oral comprehensive qualifying examinations prepared and conducted by the graduate committee. The purpose of these examinations is to determine whether or not a candidate possesses a depth of knowledge in their area of
specialization, a breadth of knowledge in supporting areas, understanding of the scientific method, and the ability to communicate knowledge in an organized and scholarly manner. If the preliminary examination for admission to doctoral studies reveals weaknesses in the student's subject matter background, the student may be required to take remedial courses designated by the graduate faculty of the department.

Over the past few years our programs have been restructured. The tables below summarize the different programs that are or have been offered.

**Undergraduate Programs**

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Began:</th>
<th>Ended:</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Crop and Soil Science (ECSS)</td>
<td>Spring 2014</td>
<td></td>
<td>PLSS introduced Spring 2014. Current students will complete their existing programs, all new students will be PLSS.</td>
</tr>
<tr>
<td>Horticultural and Turfgrass Science (HTS)</td>
<td>Spring 2014</td>
<td></td>
<td>PLSS introduced Spring 2014. Current students will complete their existing programs, all new students will be PLSS.</td>
</tr>
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</table>
## Graduate Programs

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Began:</th>
<th>Ended:</th>
<th>Ph.D.</th>
<th>M.S.</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRO (Agronomy)</td>
<td>Fall 2009</td>
<td></td>
<td>X</td>
<td></td>
<td>Was in place prior to 2009. Began phasing this program out and started PhD in PSS Fall 2009</td>
</tr>
<tr>
<td>CRSC (Crop Science)</td>
<td></td>
<td>Spring 2013</td>
<td></td>
<td>X</td>
<td>Was in place prior to 2009. Spring 2013 all MS programs, except HORT, were combined to 1 program - PSS. The Grad School changed all MS students to PSS in the system.</td>
</tr>
<tr>
<td>ENTO (Entomology)</td>
<td></td>
<td>Spring 2011</td>
<td></td>
<td>X</td>
<td>Was in place prior to 2009. Changes to PLPR spring 2011. Students could choose to complete their program as ENTO, but all new students would be PLPR.</td>
</tr>
<tr>
<td>HORT (Horticulture)</td>
<td></td>
<td>Fall 2014</td>
<td></td>
<td>X</td>
<td>Was in place prior to 2009. Changed to HSCI Fall 2014.</td>
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<tr>
<td>HSCI (Horticulture Science)</td>
<td>Fall 2014</td>
<td></td>
<td></td>
<td>X</td>
<td>Introduced Fall 2014</td>
</tr>
<tr>
<td>PLPR (Plant Protection)</td>
<td></td>
<td>Spring 2011</td>
<td></td>
<td></td>
<td>Introduced Spring 2011. Spring 2013 all MS programs, except HORT, were combined to 1 program - PSS.</td>
</tr>
<tr>
<td>PSS - PhD (Plant and Soil Science)</td>
<td>Fall 2009</td>
<td></td>
<td></td>
<td>X</td>
<td>PhD in PSS introduced Fall 2009, students already on the AGRO program could remain as AGRO but all new PhD students would be PSS. This is still a current program.</td>
</tr>
<tr>
<td>SS (Soil Science)</td>
<td></td>
<td>Spring 2013</td>
<td></td>
<td>X</td>
<td>Was in place prior to 2009. Spring 2013 all MS programs, except HORT, were combined to 1 program - PSS. The Grad School changed all MS students to PSS in the system.</td>
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## Certificate program

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<th>Program Name:</th>
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<th>Ended:</th>
<th>Notes:</th>
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<tr>
<td>Crop Protection (CRPR)</td>
<td></td>
<td>Still Current</td>
<td>Was in place prior to 2009 and is still current.</td>
</tr>
<tr>
<td>Fibers &amp; Textiles (FBTS)</td>
<td></td>
<td>Still Current</td>
<td>Was in place prior to 2009 and is still current.</td>
</tr>
<tr>
<td>Horticultural Landscape Management (HOLM)</td>
<td></td>
<td>Still Current</td>
<td>Was in place prior to 2009 and is still current.</td>
</tr>
<tr>
<td>Soil Management (SMGT)</td>
<td></td>
<td>Still Current</td>
<td>Was in place prior to 2009 and is still current.</td>
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</table>
B. Number and types of degrees awarded

![Bar chart showing degrees awarded by fiscal year from 2009 to 2014.]

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<tr>
<th>Year</th>
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<th>Masters</th>
<th>Doctorates</th>
<th>Grad Totals</th>
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<tr>
<td>2014</td>
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*Source: IR*
Plant and Soil Sciences
NO DATA AVAILABLE FOR HSCI
Degrees Awarded - Academic Year (PLPR)

Source: Institutional Research
Chart Prepared by the Graduate School

<table>
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<tr>
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*Source: IR*
Degrees Awarded - Fiscal Year (PSS)

Source: Institutional Research
Chart Prepared by the Graduate School

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<tbody>
<tr>
<td>Bachelor</td>
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*Source: IR*
Degrees Awarded - Academic Year (SS)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR*
Degrees Awarded - Academic Year (CRSC)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR

Degrees Awarded - Spring/Summer/Fall

*Source - Department

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<tbody>
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<td>Bachelor</td>
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<td>6</td>
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</tbody>
</table>
C. What is your department or program doing in respect to Low Preforming Programs (LPP) as defined by the Texas Higher Education Coordinating Board (04.10.1). (http://www.depts.ttu.edu/oppol/Chapter04.pdf)

The Plant Protection and the Soil Science MS were low performing. Therefore, we proposed to consolidate three M.S. programs: Crop Science, Plant Protection, and Soil Science and to also offer an emphasis in Fiber and Biopolymer Science (an emerging technology in this field that was hosted under the Crop Science program). Graduates in the three M.S. programs were placed successfully within jobs and further graduate study. The Agriculture industry routinely interviews and hires MS graduates from the PSS department. From the feedback we receive, our MS graduates are generally well trained for field work, data collection, data analyses, and reporting. Following we are summarizing the different elements that led us to conclude that this consolidation was the best strategy:
The Bureau of Labor Statistics (Occupational Outlook Handbook 2014-15 Edition) states that the employment of soil and plant scientists is expected to increase by 9% from 2012 to 2022. The median salary in 2012 was $58,740 per year. The lowest 10% earned less than $34,750 and the top 10% more than $104,840. Plant and soil scientists will be needed to balance increased agricultural output while protecting and preserving soil, water and ecosystems. They increasingly will help develop sustainable agricultural practices by creating and carrying out plans to manage pests, crops, soil fertility, and erosion in ways that reduce the use of harmful chemicals and minimize damage to the natural environment. In addition, demand for biofuels and bioproducts - renewable energy and materials sources from plants - is expected to increase.

The USDA (http://www3.ag.purdue.edu/USDA/employment/pages/default.aspx) forecasts that during 2010-15, five percent more college graduates with expertise in agricultural and food systems, renewable energy, and the environment will be needed when compared to 2005-10. More than enough graduates will likely be available during the next couple of years in some occupations, but a shortfall of new graduates with preparation in priority business and science specialties is forecast in the latter half of the period. The strongest demand is anticipated for graduates with college degrees and related work experiences in agriculture, forestry, and environmental science and management.

The USDA (http://www3.ag.purdue.edu/USDA/employment/Pages/ag.aspx) “Look[s] for approximately 7,900 average annual job openings for graduates in agricultural and forestry production occupations—the foundation of the U.S. food, agricultural, and natural resource system” during 2010-15. They list several “Priority Occupations” that are directly supported by this new M.S. in Plant and Soil Science. Those priority occupations are “Crop Management Consultant…Land Use manager…Precision Agriculture Specialist…Renewable Energy Crop Producer…and Seed Producer.”

The Crop Management Consultant would need an M.S. in Plant and Soil Science with concentration areas in Crop Science or Fibers and Biopolymers or Plant Protection or Soil Science. Dr. Mike Gilbert, Head of Breeding and Trait Developments for Bayer CropScience states “Our company, Bayer CropScience, has extensive operations in Lubbock as well as several locations in the U.S. and around the world. As such, we have numerous jobs within this field and have hired a number of graduates from Texas Tech. We have also sponsored graduates in their education with excellent results”.

The Land Use Manager would need an M.S. in Plant and Soil Science with concentration areas in Crop Science or Plant Protection or Soil Science. Mr. Kelley Attebury, Resource Soil Scientist with the USDA-NRCS, says “As ever-evolving governmental agencies, as well and private industries, strive to adapt to challenging economic times, it is imperative that institutions like Texas Tech University continue to produce high quality students who can fill our needs. Graduates prepared by the Plant and Soil Science Department at TTU are highly prized. We see many applicants and the same cannot always be said of many other schools”.

Plant and Soil Sciences
• The Precision Agriculture Specialist would need an M.S. in Plant and Soil Science with concentration areas in Crop or Plant Protection or Soil Science. Mr. Steve Verett, Executive Vice President, states “Plains Cotton Growers, Inc., strongly supports the applications for a new Master of Science program originating from the Department of Plant and Soil Sciences at Texas Tech University. Headquartered in Lubbock, Texas, Plains Cotton Growers is an organization advocating on behalf of cotton producers in a 41-county area in Texas from the top of the Texas Panhandle to the Permian Basin.

• This new degree plan would be an excellent move for the department, as the work they do is critical to the continued development of the cotton industry, which is one of the major economic drivers for Lubbock and West Texas. Students could more readily concentrate in an area of interest to them, which would be great value as they enter the workforce”.

• The Renewable Crop Producer would need an M.S. in Plant and Soil Science with concentration areas in Crop Science or Fibers and Biopolymers or Plant Protection or Soil Science. Dr. Justin Weinheimer, Crop Improvement Program Director says “The United Sorghum Checkoff Program is always searching for ways to bring more value to the sorghum industry. Traditionally, this process is done through facilitating industry, academic, and grower relations to improve all aspects of the industry. However, advancing the sorghum industry relies heavily on engaging individuals who have exceptional training in the study of plant and soil sciences”.

• The Seed Producer would need an M.S. in Plant and Soil Science with concentration areas in Crop Science or Fibers and Biopolymers or Plant Protection. Dr. Roy Cantrell, Global Cotton Breeding Leader, states “Monsanto has a large scientific research facility in Lubbock for Cotton Breeding and Biotechnology. One of the primary reasons for locating in Lubbock was access to high quality skilled scientific talent. We have not been disappointed, as we have hired several TTU graduates in recent years. The breadth of knowledge of students from this program will make it a continued recruiting pool for Monsanto”.

It is expected that approximately 53,500 qualified graduates to be available each year. About 55 percent of the total, 29,300 are expected to earn degrees from colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine. The other 45 percent, an estimated 24,200 graduates, will come from allied disciplines including biological sciences, engineering, health sciences, business, and communication.

Employers have expressed a preference for graduates from colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine who tend to have relatively stronger interests and more extensive work experiences for careers in food, renewable energy, and the environment than those from allied fields of study. These graduates will likely continue to be preferred by many employers, but it is important to note that there were nearly 10 percent fewer agriculture and life sciences, forestry and natural resources, and veterinary medicine graduates produced in U.S. colleges and universities in 2008 than in 2002.

Therefore, we strongly believe that our restructured MS program will better serve the projected market needs.
D. Undergraduate and graduate semester credit hours

![Bar chart showing department semester credit hours for fiscal years 09/10 to 14/15. The chart compares undergraduate and graduate credit hours.](image)

<table>
<thead>
<tr>
<th>Year</th>
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<th>Graduate</th>
</tr>
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<td>1,241</td>
</tr>
<tr>
<td>10/11</td>
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<tr>
<td>13/14</td>
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<td>14/15</td>
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*Source: IR*
AY SCH Compared to Budget (PSS)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR
**AFISM
E. Number of majors in the department for the fall semesters

![Enrollment by Level - Fall Data (AGRO)](chart)

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*Source: IR*
Enrollment by Level - Fall Data (ENTO)
Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR*
Enrollment by Level - Fall Data (HORT)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR

NO DATA AVAILABLE FOR HSCI
Enrollment by Level - Fall Data (PLPR)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR*
Enrollment by Level - Fall Data
(SS)
Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR*
Enrollment by Level - Fall Data (CRSC)

Source: Institutional Research
Chart Prepared by the Graduate School

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*The Source for data is from the Peer Institutions but Texas Tech data is from IR.

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<th>Enrollment - Fall Data</th>
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<td>44</td>
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</table>

*Source - Department

Plant and Soil Sciences
## Enrollment Growth for Review Period: 2014 as a Percentage of 2009

*Source: Institutional Research*

Table Prepared by the Graduate School

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<tr>
<td>Number of Doctoral Students</td>
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<tr>
<td>Total Number of Graduate Students</td>
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*Fiscal Year Data*
Course enrollments over the past six years (enrollment trends by course)

- Figures are totals – classes may be offered more than once a year

### Course Enrollments by Academic Year

*Source: Institutional Research*

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**AY Totals:**

- 480
- 551
- 547
- 449
- 436
- 438

Plant and Soil Sciences
G. Courses cross listed (TANDEM) (UG and Grad – need syllabus in appendix J for both UG and Grad individual courses)

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<td>Adv. Nursery Management / Garden Center Management</td>
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Plant and Soil Sciences
III. Faculty

A. Number, rank, and demographics of the graduate faculty (tenure and tenure track), GPTI’s and TA’s

*Source: IR*
Department Tenured and Tenure-Track by Rank - Fall Data (PSS)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Data comes from Peer Institutions but Texas Tech data comes from IR.*
### List of Faculty Members

List all faculty who were employed by your department during the six years of this review

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<td>Dick Auld</td>
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<td>Kevin Bronson</td>
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<td>8/6/2010</td>
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<td>Mark Burow</td>
<td>Professor of Molecular Genetics w/Joint Appointment at Texas A&amp;M AgriLife Research</td>
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<td>Sanjit Deb</td>
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<td>Peter Dotray</td>
<td>Professor of Weed Science &amp; Leidigh Professor w/Joint Appointment at Texas A&amp;M AgriLife Research</td>
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<td>Dean Ethridge</td>
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<td>Ed Hellman</td>
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<td>Venugopal Mendu</td>
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<tr>
<td>Thea Wilkins</td>
<td>Professor of Cotton Genomics</td>
<td>1/1/2006</td>
<td>3/31/2014</td>
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</tr>
<tr>
<td>Kirk Williams</td>
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<td>12/1/2006</td>
<td>2/5/2015</td>
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<tr>
<td>Jason Woodward</td>
<td>Associate Professor of Plant Pathology w/Joint Appointment at Texas A&amp;M AgriLife Research</td>
<td>7/1/2006</td>
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<tr>
<td>Robert Wright</td>
<td>Associate Professor of Crop Genomics w/Joint Appointment at Texas A&amp;M AgriLife Research</td>
<td>8/15/2002</td>
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<td>Joseph Young</td>
<td>Assistant Professor Turfgrass Science</td>
<td>1/1/2013</td>
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<tr>
<td>Wenwei Xu</td>
<td>Professor of Corn Breeding w/Joint Appointment at Texas A&amp;M Agrilife Research</td>
<td>8/16/1993</td>
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<tr>
<td>Richard Zartman</td>
<td>Department Chair and Leidigh Professor of Soil Physics</td>
<td>9/1/1974</td>
<td>8/31/2014</td>
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C. Summary of the number of refereed publications and creative activities.

**Faculty publications**

<table>
<thead>
<tr>
<th>Publication Type</th>
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<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<td>197</td>
<td>245</td>
<td>139</td>
<td>217</td>
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<td>37</td>
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<tr>
<td>Presentations/Posters</td>
<td>202</td>
<td>288</td>
<td>122</td>
<td>175</td>
<td>195</td>
<td>206</td>
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<tr>
<td>Abstracts/Proceedings</td>
<td>120</td>
<td>148</td>
<td>85</td>
<td>133</td>
<td>132</td>
<td>149</td>
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<tr>
<td>Technical/Popular Articles</td>
<td>26</td>
<td>18</td>
<td>21</td>
<td>46</td>
<td>48</td>
<td>18</td>
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<td>Seminar/Professional Meetings</td>
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<td>42</td>
<td>5</td>
<td>24</td>
<td>26</td>
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</table>

Source: The Department

*Other publications = Electronic media*

As our Department as many joint appointees and in order to reflect better the nature of our Department, we chose to show the number of graduate faculty contributing rather than the number of full time faculty contributing. We also chose to show the FTE in the Department rather than the number of full time faculty.

**Faculty publications involving at least one graduate student**

<table>
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<tr>
<th>Publication Type</th>
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<tr>
<td>Presentations/Posters</td>
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<td>288</td>
<td>122</td>
<td>175</td>
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Source: The Department
D. Responsibilities and leadership in professional societies

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<td>Editor/Editorial</td>
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<tr>
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<td>6</td>
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N = # of graduate faculty contributing  F = # of FTE in department

As our Department as many joint appointees and in order to reflect better the nature of our Department, we chose to show the number of graduate faculty contributing rather than the number of full time faculty contributing. We also chose to show the FTE in the Department rather than the number of full time faculty. The PSS faculty are active in professional service through a variety of positions in professional organizations. These include serving on editorial boards of professional journals, executive boards of professional organizations, and as officers and committee members in national and state organizations.

Currently, PSS faculty serve on editorial boards of 15 national and international scientific journals (Algerian Journal of Natural Products; American Peanut Research and Education Society; Compendium of Cotton Diseases; Crop Science; Journal of Cotton Science; Journal of Crop Science; Journal of Maize Sciences; Journal of Materials and Environmental Science; Journal of Modern Textile Science and Engineering; Moroccan Journal of Chemistry; Peanut Science; Pedosphere; Plant Disease Management Reports; Plant Health Progress; and SOIL), the executive boards of five (5) professional organizations (Composting Council Research and Education Foundation; National Grape and Wine Initiative; Southern Weed Science Society; Texas Turfgrass Association; Texas Sports Turf Managers Association), and are officers of four (4) national professional organizations (American Society for Horticultural Science, Teaching Division; Association for the Advancement of Industrial Crops; International Cotton Research Association; and Southern Division American Phytopathological Society).

The faculty also serve on 20 professional organization committees (Graduate Research Panel, National Science Foundation; Membership Committee, American Society of Agronomy; Nomination Committee, Southern Region American Society for Horticultural Science; Chair, Ornamental Publication Awards Committee, American Society for Horticultural Science; Publication Committee, Native Orchid Conference Journal; U.S. Maize Crop Germplasm Committee; Advisory Board, Texas State Crop Testing Program; Illustrated Guide to Soil Taxonomy Task Force; USDA Technical Committee on Cotton Quality; International Committee on Testing Methods, International Textile Manufactures Federation; National Cotton Council Disease Committee; American Phytopathological Society, Teaching Committee; American Phytopathological Society, Extension Pathologist Committee; American Phytopathological Society, Integrated Disease Management Committee; National Cotton Council Disease Committee; National Grape and Wine Initiative Extension and Outreach Education Committee; Texas Wine and Grape Growers Association, Education Committee; Texas Wine and Grape Growers Association, Crop Insurance Committee; Texas Wine and Grape Growers Association 2,4-D Committee; International Committee on Testing Methods, International Textile Manufactures Federation).

Source: The Department
### Student Committee Service

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Committees Chaired</th>
<th>Committees Served in department</th>
<th>Committees Served outside department</th>
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<tbody>
<tr>
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<td>Doctoral</td>
<td>Masters</td>
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<tr>
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<tr>
<td>Woodward, J</td>
<td>13</td>
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<td>Wright, R</td>
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<td>Xu, W</td>
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<td>Young, J</td>
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</table>

*Source: The Department*
E. Assess average faculty productivity for Fall semesters only (use discipline appropriate criteria to determine)

<table>
<thead>
<tr>
<th>FACULTY WORKLOAD</th>
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<tbody>
<tr>
<td>Source: Institutional Research</td>
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<td>Table Prepared by the Graduate School</td>
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<thead>
<tr>
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<td>Texas Tech University</td>
<td>15.52</td>
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<td>21.87</td>
<td>22.94</td>
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</table>

*Source: IR*
College SCH/FTE - Fall Data
(College of Agricultural Sciences and Natural Resources)

Source: Institutional Research
Chart Prepared by the Graduate School

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<th>College</th>
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<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
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</thead>
<tbody>
<tr>
<td>SCH/FTE for Total Faculty</td>
<td>191</td>
<td>193</td>
<td>204</td>
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</table>

*Source: IR*
Department SCH/FTE - Fall Data (PSS)

Source: Institutional Research
Chart Prepared by the Graduate School

<table>
<thead>
<tr>
<th>Department</th>
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*Source: IR
IV. Graduate Students

A. Applicants and enrolled students

![Graduate Student Summary by Category - Fall Data (AGRO)](chart)

*Source: Institutional Research
Chart Prepared by the Graduate School

<table>
<thead>
<tr>
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<td>Total Applicants</td>
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<tr>
<td>Total Admitted</td>
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<tr>
<td>New Grad Students</td>
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*Source: IR
**Students Graduated data is by Academic Year
Graduate Student Summary by Category - Fall Data (ENTO)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR*

**Students Graduated data is by Academic Year**
NO DATA AVAILABLE FOR HSCI/PLPR
Graduate Student Summary by Category - Fall Data (PSS)

Source: Institutional Research
Chart Prepared by the Graduate School

<table>
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<tr>
<th>Year</th>
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<th>Students Graduated</th>
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<td>2014</td>
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<td>14</td>
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<td>16</td>
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</tbody>
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*Source: IR*

**Students Graduated data is by Academic Year**
Graduate Student Summary by Category - Fall Data

Source: Institutional Research
Chart Prepared by the Graduate School

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<td>1</td>
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<td></td>
</tr>
<tr>
<td>Students Graduated</td>
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</tbody>
</table>

*Source: IR

**Students Graduated data is by Academic Year
Graduate Student Summary by Category - Fall Data (CRSC)

Source: Institutional Research
Chart Prepared by the Graduate School

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<tr>
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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>New Grad Students</td>
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*Source: IR

**Students Graduated data is by Academic Year
NO DATA AVAILABLE FOR AGRO/HSCI/PLPR
### Graduate Applicants by Region - Fall Data (HORT)

**Source:** Institutional Research  
**Charp Prepared by the Graduate School**

#### Bar Chart

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<th>Year</th>
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*Source: IR*
### Graduate Applicants by Region - Fall Data (PSS)

Source: Institutional Research
Charp Prepared by the Graduate School

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*Source: IR*
Graduate Applicants by Region - Fall Data
(SSID)
Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR*
Graduate Applicants by Region - Fall Data (CRSC)

Source: Institutional Research
Charp Prepared by the Graduate School

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*Source: IR*
**Agronomy**

**Graduate Applicants – Fall Data**  
*No Data Available*

**Admitted Graduate Students – Fall Data**  
*No Data Available*

**Enrolled New Graduate Students – Fall Data**  
*No Data Available*

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*Source: IR*
**Entomology**

### Graduate Applicants - Fall Data

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**Total Admitted**: 2 1 0 0 0 0 0 0 0 0 0

*Source: IR*

### Admitted Graduate Students - Fall Data

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**Gender Total**: 0 1 0 0 0 0 0 0 0 0 0

**Total Admitted**: 1 0 0 0 0 0 0 0 0 0 0

*Source: IR*

### Enrolled New Graduate Students - Fall Data

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**Gender Total**: 0 1 0 0 0 0 0 0 0 0 0

**Total Admitted**: 1 0 0 0 0 0 0 0 0 0 0

*Source: IR*

### Demographics of Enrolled Graduate Students - Fall Data

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**Total Admitted**: 5 2 0 0 0 0 0 0 0 0 0

*Source: IR*
### Horticulture

#### Graduate Applicants - Fall Data

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**Gender Total** | 15 | 8 | 8 | 14 | 11 | 8 | 15 | 7 | 5 | 3 | 0 | 0

**Total Admitted** | 23 | 22 | 19 | 22 | 8 | 0

*Source: IR*

#### Admitted Graduate Students - Fall Data

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**Gender Total** | 3 | 5 | 6 | 6 | 3 | 2 | 7 | 3 | 4 | 2 | 0 | 0

**Total Admitted** | 8 | 12 | 5 | 10 | 6 | 0

*Source: IR*

#### Enrolled New Graduate Students - Fall Data

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**Gender Total** | 10 | 1 | 4 | 4 | 2 | 1 | 3 | 1 | 1 | 1 | 0 | 0

**Total Admitted** | 11 | 8 | 3 | 4 | 2 | 0

*Source: IR*
Horticulture Science
Graduate Applicants – Fall Data
  No Data Available
Admitted Graduate Students – Fall Data
  No Data Available
Enrolled New Graduate Students – Fall Data
  No Data Available
Demographics of Enrolled Graduate Students – Fall Data
  No Data Available

Plant Protection
Graduate Applicants – Fall Data
  No Data Available
Admitted Graduate Students – Fall Data
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Enrolled New Graduate Students – Fall Data
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Demographics of Enrolled Graduate Students – Fall Data
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*Source: IR
### Plant and Soil Science

#### Graduate Applicants - Fall Data

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**Gender Total**: 7 9 5 10 7 12 9 5 8 20 16 18

**Total Admitted**: 16 15 19 14 28 34

*Source: IR*

#### Admitted Graduate Students - Fall Data

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**Total Admitted**: 13 10 6 11 16 14

*Source: IR*

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**Total Admitted**: 7 3 4 4 13 10

*Source: IR*

#### Demographics of Enrolled Graduate Students - Fall Data

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**Gender Total**: 6 7 9 14 8 19 10 17 22 46 23 48

**Total Admitted**: 13 23 27 27 68 71

*Source: IR*
## Soil Science

### Graduate Applicants - Fall Data

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*Source: IR

### Admitted Graduate Students - Fall Data

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*Source: IR

### Enrolled New Graduate Students - Fall Data

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*Source: IR

### Demographics of Enrolled Graduate Students - Fall Data

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*Source: IR
### Crop Science

#### Graduate Applicants - Fall Data

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</table>

*Gender Total* | 4    | 6    | 5    | 5    | 4    | 3    | 6    | 6    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

*Total Admitted* | 10   | 10   | 7    | 12   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

*Source: IR*

#### Admitted Graduate Students - Fall Data

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</table>

*Gender Total* | 4    | 6    | 5    | 5    | 4    | 3    | 6    | 6    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

*Total Admitted* | 10   | 10   | 7    | 12   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

*Source: IR*

#### Enrolled New Graduate Students - Fall Data

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</table>

*Gender Total* | 3    | 4    | 5    | 5    | 3    | 3    | 4    | 4    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

*Total Admitted* | 7    | 10   | 6    | 8    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

*Source: IR*

#### Demographics of Enrolled Graduate Students - Fall Data

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*Gender Total* | 4    | 15   | 10   | 21   | 14   | 24   | 11   |

*Total Admitted* | 19   | 31   | 38   | 35   | 0    | 0    | 0    |

*Source: IR*
Comparison of Students
Applied/Admitted/Enrolled - Fall Data
(PSS)
Source: COGNOS
Chart Prepared by the Graduate School

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<tr>
<td>% Admitted from Applied</td>
<td>81%</td>
<td>69%</td>
<td>52%</td>
<td>71%</td>
<td>88%</td>
<td>49%</td>
<td>60%</td>
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| Admitted | 25   | 27   | 16   | 22   | 15   | 17   | 33   |
| Enrolled  | 22   | 24   | 14   | 19   | 15   | 12   | 26   |
| % Enrolled from Admitted | 88% | 89% | 88% | 86% | 100% | 71% | 79% |

% Enrolled from Applied
71% 62% 45% 61% 88% 34% 47%

*Source: COGNOS
*Table reflects fall data
Comparison of Students
Applied/Admitted/Enrolled - Fall Data
(College of Agricultural Science and Natural Resources)
Source: COGNOS
Chart Prepared by the Graduate School

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<td>92</td>
<td>68</td>
<td>81</td>
<td>105</td>
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<td>% Admitted from Applied</td>
<td>76%</td>
<td>69%</td>
<td>67%</td>
<td>67%</td>
<td>84%</td>
<td>53%</td>
<td>55%</td>
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| Admitted      | 108  | 108  | 92   | 68   | 81   | 105  | 140  |
| Enrolled      | 97   | 101  | 87   | 61   | 77   | 71   | 103  |
| % Enrolled from Admitted | 90%  | 94%  | 95%  | 90%  | 95%  | 68%  | 74%  |

% Enrolled from Applied | 68%  | 65%  | 64%  | 60%  | 80%  | 36%  | 41%  |

*Source: COGNOS*

*Table reflects fall data*
Comparison of Students
Applied/Admitted/Enrolled - Fall Data
(Texas Tech University)
Source: COGNOS
Chart Prepared by the Graduate School

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<td>72%</td>
<td>68%</td>
<td>72%</td>
<td>83%</td>
<td>46%</td>
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| Admitted        | 2158 | 2095 | 1599 | 1575 | 1768 | 2827 | 2512 |
| Enrolled        | 1953 | 1920 | 1406 | 1352 | 1588 | 1746 | 1652 |
| % Enrolled from Admitted | 91%  | 92%  | 88%  | 86%  | 90%  | 62%  | 66%  |

| % Enrolled from Applied | 69%  | 66%  | 60%  | 62%  | 75%  | 28%  | 26%  |

*Source: COGNOS

*Table reflects fall data.
In addition to the data above, the Department attempted to summarize the main metrics in the charts below:
Graduate: distance vs. on campus

Graduate enrollment
B. GRE (see appendix h)

NO DATA AVAILABLE FOR AGRO/HSCI/PLPR
Average GRE Scores for Enrolled Graduate Students - Fall Data (HORT)

Source: IR
Chart Prepared by the Graduate School

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<tr>
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<td>612</td>
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Average GRE Scores for Enrolled Graduate Students - Fall Data
(PSS)
Source: Institutional Research
Chart Prepared by the Graduate School

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Average GRE Scores for Enrolled Graduate Students - Fall Data

Source: Institutional Research
Chart Prepared by the Graduate School

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C. GPA of new students

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</table>

*Source: IR*

NO DATA AVAILABLE FOR AGRO/HORT/HSCI/PLPR
New Graduate Student GPA by Level - Fall Data
(PSS)
Source: Institutional Research
Chart Prepared by the Graduate School

<table>
<thead>
<tr>
<th>Year</th>
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<td>2011</td>
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<td>2013</td>
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<tr>
<td>2014</td>
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<td>3.88</td>
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*Source: IR*
New Graduate Student GPA by Level - Fall Data

(SS)

Source: Institutional Research
Chart Prepared by the Graduate School

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<tbody>
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</table>

*Source: IR
New Graduate Student GPA by Level - Fall Data (CRSC)

Source: Institutional Research
Chart Prepared by the Graduate School

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<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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*Source: IR*
D. Time to Degree – Average long semesters to graduate for all students graduating each year

![Time to Degree - Number of Long Semesters (AGRO)](chart)

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<th>Years</th>
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<td>2010-2011</td>
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<td>2011-2012</td>
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<td>2012-2013</td>
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<td>2013-2014</td>
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<tr>
<td>2014-2015</td>
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*Source: IR

**Excludes Summer I and Summer II
Time to Degree - Number of Long Semesters (ENTO)
Source: Institutional Research
Chart Prepared by the Graduate School

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<tr>
<td>Doctorate</td>
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*Source: IR

**Excludes Summer I and Summer II
NO DATA AVAILABLE FOR HSCI
Time to Degree - Number of Long Semesters
(PLPR)
Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR

**Excludes Summer I and Summer II
Time to Degree - Number of Long Semesters (PSS)

Source: Institutional Research
Chart Prepared by the Graduate School

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<td>2014-2015</td>
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*Source: IR

**Excludes Summer I and Summer II
**Time to Degree - Number of Long Semesters**

(SS)

Source: Institutional Research
Chart Prepared by the Graduate School

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*Source: IR*

**Excludes Summer I and Summer II**
Time to Degree - Number of Long Semesters (CRSC)

Source: Institutional Research
Chart Prepared by the Graduate School

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<td>2013-2014</td>
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</tr>
<tr>
<td>2014-2015</td>
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</tbody>
</table>

*Source: IR
**Excludes Summer I and Summer II
E. Provide a breakdown of how many enrolled graduate students are RA’s, TA’s, GA’s or GPTI’s by Academic Year.

**Total PSS + FBRI**

<table>
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<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
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<td>55</td>
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<td>20</td>
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</table>

*Source: The Department*

**PSS only**

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<th>13/14</th>
<th>14/15</th>
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<tr>
<td>Graduate Assistants</td>
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*Source: The Department*

**FBRI only**

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<th>13/14</th>
<th>14/15</th>
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</thead>
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<tr>
<td>Research Assistants</td>
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<td>12*</td>
<td>11*</td>
<td>9*</td>
<td>14*</td>
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<tr>
<td>Teaching Assistants</td>
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<tr>
<td>Graduate Assistants</td>
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<tr>
<td>Graduate Part-time Instructors</td>
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</tbody>
</table>

*In 09/10: 5 students are from Engineering; 10/11: 4 students are from Engineering; 11/12: 2 students are from Engineering; 12/13: 1 student is from Engineering; 13/14: 1 student is from Engineering*
F. Number of students who have received national and university fellowships, scholarships and other awards

Graduate School Scholarships and Fellowships

Source and Table by the Graduate School

<table>
<thead>
<tr>
<th>AWARD</th>
<th>09/10</th>
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<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
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</table>
### National, University, Departmental and Local Scholarships and Fellowships

Source and Table by the Department

#### Departmental Scholarship Information (for graduate students only)

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<td>$1,700 2</td>
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Plant and Soil Sciences
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</thead>
<tbody>
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Plant and Soil Sciences
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**2014**

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| R10478665 | Cotton Breeder          | Americot/Next Generation            |                |
| R00412901 | Ph.D. Student           | TTU                                  | Lubbock TX     |
| R10431074 | Post Doc Research Associate | USDA-ARS                           | Lubbock TX     |
| R00633082 | Technician              | Texas A&amp;M AgriLife Research         | Lubbock TX     |
| R00740028 | Post Doc Research Intern | E &amp;J Gallo Winery                   | Modesto, California |
| R00532409 | Assistant Professor     | TTU                                  | Lubbock TX     |
| R10524551 | Ph.D. Student           | TTU                                  | Lubbock TX     |
| R10415828 | Post Doc                | TTU                                  | Lubbock TX     |
| R10476993 | Unknown                 |                                      |                |
| R00825497 | Ph.D. Student           | Mississippi State                   | Mississippi    |
| R00757158 | Program Coordinator Urban Water | TAMU                               | Dallas TX      |
| R10502429 | Library Service Manager | TAMU                                 | Galveston TX   |
| R10393181 | Instructor              | Ozarks Technical Community College   | Springfield MO |
| R10467580 | LSU Ag Center           |                                      | Louisiana      |
| R00417851 | IMP Company             |                                      | California     |
| R00897288 | Unknown                 |                                      |                |
| R10468108 | Field Researcher        | Bayer Crop Science                  | Shafter, CA    |
| R00485280 | Technician              | Agri-Search                         | Plainview, TX  |
| R11020076 | Teaching Horticulture   | Brigham Young University             | Idaho          |</p>
<table>
<thead>
<tr>
<th>R#</th>
<th>Initial Position</th>
<th>Initial Employer</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>R10477075</td>
<td>Elementary School Teacher</td>
<td>Newton Rayzor Elem. School</td>
<td>Texas</td>
</tr>
<tr>
<td>R11197423</td>
<td>Restaurant Co-owner</td>
<td>Restaurant</td>
<td></td>
</tr>
<tr>
<td>R11020768</td>
<td>Ph.D. Student</td>
<td>TTU</td>
<td>Lubbock TX</td>
</tr>
<tr>
<td>R00911853</td>
<td>Manager</td>
<td>Chinese Pharmaceutical Company</td>
<td>Beijing, China</td>
</tr>
<tr>
<td>R00471353</td>
<td>Private Industry</td>
<td></td>
<td>Vega, TX</td>
</tr>
</tbody>
</table>

2015

| R00900087 | Research Associate             | TTU                                           | Lubbock TX       |
| R00749274 | Post Doc                       | TTU                                           | Lubbock TX       |
| R00468672 | Horticulture Instructor        | TTU                                           | Lubbock TX       |
| R10285339 | Ph.D. Student                  | TTU                                           | Lubbock TX       |
| R00436216 | Tyler Horticulture Agent       | TAMU                                          | Tyler, TX        |
| R10418033 | Instructor                     | TTU                                           | Lubbock TX       |
| R11165387 | Looking for a job              |                                               |                  |
| R00217249 | Cartographic Technician        | NRCS                                          |                  |
| R11094938 | Job Searching/Ph.D. Program    |                                               |                  |
| R11213073 | Research Assistant Department of Geosciences | TTU | Lubbock TX |
| R11334827 | Moved back to Germany          | Humboldt University                           | Berlin, Germany  |
| R00774689 | Environmental Health and Safety | TTU                                           | Lubbock TX       |
| R11299214 | Ph.D. Student                  | NCSU                                          | North Carolina   |
| R11028151 | Home grower of organic Vegetables | Home                                        | Colorado         |
| R00761272 | Instructor Biology             | Amarillo College                              | Amarillo TX      |
H. Percentage (%) of full time students receiving financial support.

<table>
<thead>
<tr>
<th></th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA+TA+GA+GPTI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>58</td>
<td>79</td>
<td>77</td>
<td>61</td>
<td>72</td>
<td>74</td>
</tr>
<tr>
<td>%</td>
<td>64.4</td>
<td>79.8</td>
<td>74.8</td>
<td>69.3</td>
<td>81.8</td>
<td>85.1</td>
</tr>
<tr>
<td>Graduate scholarship recipients</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>N</td>
<td>60</td>
<td>43</td>
<td>56</td>
<td>48</td>
<td>54</td>
<td>58</td>
</tr>
<tr>
<td>%</td>
<td>66.7</td>
<td>43.4</td>
<td>54.4</td>
<td>54.5</td>
<td>61.4</td>
<td>66.7</td>
</tr>
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</table>

I. Graduate Student Publications and Creative Activities – Number of discipline-related refereed papers/publications, juried creative/performance accomplishments, book chapters, books, and external presentations by Master and Doctoral students in the department.

<table>
<thead>
<tr>
<th>Publication:</th>
<th>Refereed</th>
<th>Non-Refereed</th>
<th>Poster Presentations</th>
<th>Other activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Masters</td>
<td>Doctorate</td>
<td>Masters</td>
<td>Doctoral</td>
</tr>
<tr>
<td>Year</td>
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<tr>
<td>2014</td>
<td>22</td>
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<td>49</td>
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<tr>
<td>2013</td>
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<tr>
<td>2009</td>
<td>9</td>
<td>17</td>
<td>22</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: The Department

N.B: Data presented in this table involve at least one graduate student.
Refereed means: refereed publications, books, and book chapters
Other activities means: Technical/Popular articles/Industrial meetings/Field Days/Growers Meetings
1 patent involved MS student in 2014
2 patents involved MS student in 2010
2 patents involved MS student in 2009
1 patent involved PhD student in 2014
2 patents involved PhD student in 2010
<table>
<thead>
<tr>
<th>Year</th>
<th>Refereed Masters</th>
<th>Refereed Doctorate</th>
<th>Non-Refereed Masters</th>
<th>Non-Refereed Doctoral</th>
<th>Poster Presentations Masters</th>
<th>Poster Presentations Doctoral</th>
<th>Other activities Masters</th>
<th>Other activities Doctoral</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>20</td>
<td>47</td>
<td>50</td>
<td>88</td>
<td>34</td>
<td>68</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>2013</td>
<td>15</td>
<td>35</td>
<td>42</td>
<td>80</td>
<td>34</td>
<td>68</td>
<td>14</td>
<td>29</td>
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<tr>
<td>2012</td>
<td>13</td>
<td>25</td>
<td>48</td>
<td>71</td>
<td>23</td>
<td>35</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>2011</td>
<td>18</td>
<td>14</td>
<td>52</td>
<td>47</td>
<td>40</td>
<td>43</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>2010</td>
<td>5</td>
<td>28</td>
<td>49</td>
<td>52</td>
<td>54</td>
<td>47</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>2009</td>
<td>8</td>
<td>14</td>
<td>19</td>
<td>25</td>
<td>18</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: The Department

_N.B: Data presented in this table involve multiple graduate students._
Refereed means: refereed publications, books, and book chapters
Other activities means: Technical/Popular articles/Industrial meetings/Field Days/Growers Meetings

### J. Programs for mentoring and professional preparation of graduate students

As soon as they are admitted into our degree programs, all graduate students are assigned a major professor. This is valid for all graduate students, i.e., MS or PhD, on campus or distance, with or without thesis. It is our police to not admit graduate students without an identified major professor. A student's graduate program is directed by her/his major professor and a graduate advisory committee. MS graduate advisory committees are comprised of a minimum of three members. Two committee members must be from the PSS department and the third member must be from another department. PhD graduate advisory committees are comprised of a minimum five members, three of whom are PSS faculty members and two faculty members outside of the PSS department. The major professor chairs the committee and works closely with the student on all aspects of the student's graduate degree program. Additional graduate committee members are selected after joint consultation between the student and the major professor. Committee members are selected based upon their ability to contribute expertise to the student's graduate program. The major professor and the other members of the committee have significant influence on mentoring and professional preparation of the graduate students.

All PSS graduate students working on a thesis/dissertation are required to enroll in Graduate Seminar (PSS 5100) and to present poster and oral presentations. During the oral/poster presentation preparation time, the PSS faculty member in charge of PSS 5100 also helps in mentoring the student on the finer points of her/his presentation skills. The department encourages each thesis/dissertation candidate to make at least one presentation (oral or poster) at a national society meeting and to publish her/his results in a referred journal. The department, the Graduate School, and the major professor normally provide the financial support to make this possible.

### K. Department efforts to retain students and graduation rates.

Our Department devotes considerable effort into pre-acceptance screening of potential graduate students. Every effort is made to evaluate the probability that the applicants would be able to perform as successful graduate students. We base these evaluations on a broad spectrum of evaluation tools, including 1) universities previously attended, 2) courses completed and grades achieved in their undergraduate and graduate (for PhD students) programs, 3) scores on standardized tests (GRE and, in the case of international students, TOEFL), 4) letters of recommendation, and 5) the content of the letters of interest from the applicant. In many cases, the faculty
member who will most likely serve as major professor to the student will personally contact the applicant by telephone and conduct an informal interview with the applicant.

As a result of this screening process, students admitted to the PSS graduate program have a very high success rate in completing their degrees. Once a student is admitted to our graduate program they are assigned a major professor. This faculty member works with the student from the beginning of the student’s graduate work in our Department to guide their degree plan and to develop their research. In most cases, the student and the faculty member are in weekly, and often daily, contact for most of the time they are working on their degree. Because of this close association, any situations that might lead to a future retention problem can be identified early in the student’s program and actions taken to solve the issue before it becomes a major problem.

In spite of these efforts, there can be situations where the student is not successfully progressing in their degree work. In these rare cases, a dialog is implemented involving the graduate student, their faculty advisor, and either the PSS Graduate Student Coordinator or the Department Chair. If the issue cannot be successfully addressed by modifying the current research project or degree plan, the next step is to determine if a change in research project or faculty advisor would be advisable. If not and the student is a MSc candidate, an option is to shift the student to a non-thesis degree plan. Should this option not be chosen, the decision is made that the student is not likely to complete their degree. In such rare cases, the Department will counsel the student as to possible alternatives in other departments or other universities.

There is an additional point of evaluation for PhD students. Early in their degree program, PhD students meet with their full committee. The purpose of these rather formal meetings is to examine their previous course work and help develop the research plan for the student. This is an opportunity to identify potential weaknesses in the student’s previous work that might lead to poor performance by the student during the graduate work and suggest methods whereby these weaknesses can be eliminated.

Later in their graduate work, the PhD student is required to take a qualifying exam, with both written and oral components. The qualifying exam is administered prior to the student being admitted to candidacy. This is another opportunity for the graduate committee to evaluate the student’s performance and recommend additional work should that be required to address any continuing weaknesses.

At each of these steps, there is the opportunity to evaluate the progress of the PhD graduate student and recommend supplemental work should that be advisable. These evaluations, along with the regular contact between student and major professor throughout their graduate work, minimizes negative retention issues.
L. Percentage of Full-Time and Part Time students per year by level – Fall Data

<table>
<thead>
<tr>
<th>Level</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters Full Time</td>
<td>30%</td>
<td>33%</td>
<td>33%</td>
<td>23%</td>
<td>26%</td>
<td>29%</td>
</tr>
<tr>
<td>Masters Part Time</td>
<td>39%</td>
<td>37%</td>
<td>38%</td>
<td>48%</td>
<td>36%</td>
<td>32%</td>
</tr>
<tr>
<td>Doctoral Full Time</td>
<td>18%</td>
<td>22%</td>
<td>24%</td>
<td>20%</td>
<td>31%</td>
<td>31%</td>
</tr>
<tr>
<td>Doctoral Part Time</td>
<td>13%</td>
<td>8%</td>
<td>5%</td>
<td>9%</td>
<td>7%</td>
<td>8%</td>
</tr>
<tr>
<td>Masters Full Time</td>
<td>43%</td>
<td>47%</td>
<td>46%</td>
<td>32%</td>
<td>42%</td>
<td>48%</td>
</tr>
<tr>
<td>Masters Part Time</td>
<td>57%</td>
<td>53%</td>
<td>54%</td>
<td>68%</td>
<td>58%</td>
<td>52%</td>
</tr>
<tr>
<td>Doctoral Full Time</td>
<td>58%</td>
<td>73%</td>
<td>83%</td>
<td>69%</td>
<td>82%</td>
<td>79%</td>
</tr>
<tr>
<td>Doctoral Part Time</td>
<td>42%</td>
<td>27%</td>
<td>17%</td>
<td>31%</td>
<td>18%</td>
<td>21%</td>
</tr>
</tbody>
</table>
V. Department
   A. Department operating expenses

![Bar chart of Department Operating Cost: B51007 - Academic Year]

![Bar chart of Department Operating Cost: B51254 - Academic Year]

*Source: AFISM
Org #: B51007
Org #: B51254
### Department Operating Costs as a Fraction of Employees (based on FTE)

<table>
<thead>
<tr>
<th>Year</th>
<th><strong>Dept Operating Cost</strong></th>
<th><em>Faculty &amp; Staff</em></th>
<th><em>Dept Op Cost/FS</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dept Operating Cost</strong></td>
<td>$145,106</td>
<td>21F+18S = 39</td>
<td>$3,721</td>
</tr>
<tr>
<td>09/10</td>
<td>$70,975</td>
<td>20F+16S = 36</td>
<td>$1,972</td>
</tr>
<tr>
<td>10/11</td>
<td>$63,909</td>
<td>19F+14S = 33</td>
<td>$1,937</td>
</tr>
<tr>
<td>11/12</td>
<td>$112,616</td>
<td>18F+14S = 32</td>
<td>$3,519</td>
</tr>
<tr>
<td>12/13</td>
<td>$84,558</td>
<td>17F+14S = 31</td>
<td>$2,728</td>
</tr>
<tr>
<td>13/14</td>
<td>$86,077</td>
<td>21F+15S = 36</td>
<td>$2,391</td>
</tr>
</tbody>
</table>

**Source: AFISM**

*Source: The Department*

**Dept Operating Cost:**

- **09/10:** $76,596
- **10/11:** $72,848
- **11/12:** $64,705
- **12/13:** $62,622
- **13/14:** $65,805
- **14/15:** $68,579

**Dept Op Cost/FS:**

- **09/10:** $1,964
- **10/11:** $2,024
- **11/12:** $1,961
- **12/13:** $1,957
- **13/14:** $2,123
- **14/15:** $1,910

**Source: AFISM**

*Source: The Department*

**Dept Operating Cost:**

- **09/10:** $76,596
- **10/11:** $72,848
- **11/12:** $64,705
- **12/13:** $62,622
- **13/14:** $65,805
- **14/15:** $68,579

**Dept Op Cost/FS:**

- **09/10:** $1,964
- **10/11:** $2,024
- **11/12:** $1,961
- **12/13:** $1,957
- **13/14:** $2,123
- **14/15:** $1,910

**Source: AFISM**

*Source: The Department*

**Org. #: B51007**

B. Summary of Proposals (submitted)

Only the proposals passing through ORS. It does not take into account the proposals passing through Texas A&M, Project Revolution, etc.

### Summary of Number of Proposals Written

*Source: The Department*

<table>
<thead>
<tr>
<th>Years</th>
<th>Federal</th>
<th>Federal Pass-Through</th>
<th>Industrial Groups/Organizations</th>
<th>Nonprofit Organizations</th>
<th>Other</th>
<th>State</th>
<th>University</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
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<td>3.00</td>
<td>1.98</td>
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</tr>
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<td>4.00</td>
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<td>0.32</td>
<td>9.00</td>
<td>0.00</td>
<td>17.00</td>
<td>3.67</td>
</tr>
<tr>
<td>2009</td>
<td>10.00</td>
<td>6.60</td>
<td>5.00</td>
<td>2.86</td>
<td>9.00</td>
<td>0.40</td>
<td>26.00</td>
<td>5.60</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>39.00</td>
<td>36.65</td>
<td>21.00</td>
<td>6.23</td>
<td>46.00</td>
<td>1.90</td>
<td>142.00</td>
<td>20.28</td>
</tr>
</tbody>
</table>

*The number of proposals are calculated by summing up the percentage contribution of the faculty on the given proposal*

D = Disciplinary (internal)  
M = Multidisciplinary (External)
Summary of Number of Proposals Accepted  
*Source: The Department*

<table>
<thead>
<tr>
<th>Years</th>
<th>D</th>
<th>M</th>
<th>D</th>
<th>M</th>
<th>D</th>
<th>M</th>
<th>D</th>
<th>M</th>
<th>D</th>
<th>M</th>
<th>University</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>2014</td>
<td>3.00</td>
<td>1.52</td>
<td>4.00</td>
<td>0.66</td>
<td>8.00</td>
<td>0.75</td>
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<td>0.00</td>
<td>1.00</td>
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<td>1.25</td>
</tr>
<tr>
<td>2013</td>
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<td>3.00</td>
<td>0.00</td>
<td>4.00</td>
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<td>0.00</td>
<td>0.00</td>
<td>8.00</td>
<td>4.07</td>
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<tr>
<td>2012</td>
<td>2.00</td>
<td>1.38</td>
<td>2.00</td>
<td>1.15</td>
<td>6.00</td>
<td>0.50</td>
<td>20.00</td>
<td>1.55</td>
<td>0.00</td>
<td>0.00</td>
<td>10.00</td>
<td>0.95</td>
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<tr>
<td>2011</td>
<td>3.00</td>
<td>1.86</td>
<td>3.00</td>
<td>0.75</td>
<td>10.00</td>
<td>1.00</td>
<td>14.00</td>
<td>1.23</td>
<td>1.00</td>
<td>0.00</td>
<td>18.00</td>
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<tr>
<td>2010</td>
<td>2.00</td>
<td>1.56</td>
<td>3.00</td>
<td>1.65</td>
<td>13.00</td>
<td>0.00</td>
<td>8.00</td>
<td>1.94</td>
<td>0.00</td>
<td>0.00</td>
<td>25.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2009</td>
<td>7.00</td>
<td>2.76</td>
<td>1.00</td>
<td>0.35</td>
<td>10.00</td>
<td>0.40</td>
<td>23.00</td>
<td>4.10</td>
<td>2.00</td>
<td>0.00</td>
<td>10.00</td>
<td>3.30</td>
</tr>
<tr>
<td>Grand Total</td>
<td>17.00</td>
<td>11.38</td>
<td>16.00</td>
<td>4.56</td>
<td>51.00</td>
<td>2.65</td>
<td>92.00</td>
<td>13.70</td>
<td>5.00</td>
<td>1.00</td>
<td>73.00</td>
<td>9.57</td>
</tr>
</tbody>
</table>

*The number of proposals are calculated by summing up the percentage contribution of the faculty on the given proposal.

D = Disciplinary (internal)
M = Multidisciplinary (External)*

C. External Research

This table shows only the awards passing through the Office of Research Services (ORS) at TTU. It does not represent our whole research funding. Significant research funds do not pass through ORS (fiber testing for multiple sources, testing for seed or chemical companies, and grants passing through the Texas A&M system).

Summary of Faculty Awards by Home Department  
*Source: The Department*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Awards</th>
<th>Facilities &amp; Administrative</th>
<th>Award Amount</th>
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<td>10/11</td>
<td>56.15</td>
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<td>11/12</td>
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<td>12/13</td>
<td>45.53</td>
<td>$177,000</td>
<td>$4,487,487</td>
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<td>13/14</td>
<td>37.62</td>
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<td>14/15</td>
<td>38.88</td>
<td>$202,845</td>
<td>$4,747,512</td>
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<td>Totals:</td>
<td>349.07</td>
<td>$1,396,123</td>
<td>$30,150,950</td>
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</table>

The next chart shows the total grant funding for our faculty. It is a more complete picture of the research activities of the Department. Please be cautious, the data are presented by calendar year and not by fiscal year as the data sources are the faculty annual reports that are compiled on a calendar year basis.
Grant funding (calendar year)

2015 ORS as of 10/26/2015
PSS and FBRI Non-ORS estimate is based on the average 2009 through 2014
Below is the table showing only the restricted research expenditures from 2012 to 2015.

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<thead>
<tr>
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Comparison of Research Expenditures

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<th>13/14</th>
<th>14/15</th>
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<td>$4,482,841</td>
<td>$4,280,990</td>
<td>$4,823,953</td>
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*Source: The Department
**Based on calendar year

Plant and Soil Sciences
## D. Internal Funding

### PSS Source of Internal Funds (TTU)

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<th>09/10</th>
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<th>13/14</th>
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<td>$321,976</td>
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<td>$4,628,809*</td>
<td>$2,776,324*</td>
<td>$2,259,352*</td>
<td>$1,626,779*</td>
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<td>$18,800</td>
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<td>-</td>
<td>$10,458</td>
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<td>$22,370</td>
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*Mostly Texas Research Incentive Program (TRIP) Match for Bayer CropScience gift

### FBRI Source of Internal Funds (TTU)

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<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
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</thead>
<tbody>
<tr>
<td>Research Enhancement</td>
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<td>Research Promotion</td>
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<td>$4,628,809*</td>
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<tr>
<td>Graduate School Fellowships</td>
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<td>-</td>
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<td><strong>$575,641</strong></td>
<td><strong>$986,040</strong></td>
<td><strong>$933,214</strong></td>
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</table>

*Texas Research Incentive Program (TRIP) Match for Bayer CropScience gift
E. Scholarships and Endowments

The department has endowment funds valued at $8.3 million (an increase of 30% since September 2009). Of the $8.3 million, a total of $1.6 million are in scholarship endowments. Assuming an average annual earnings of 4.5%, $72,000 is generated annually for scholarships. We also have $3.5 million in Chair endowments and $2.3 in Professorship endowments. A detailed list of our endowments is presented below.

Endowment Amount ($)
Source: The Department

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>FY10 As of 9/1/09</th>
<th>FY11 As of 9/1/10</th>
<th>FY12 As of 9/1/11</th>
<th>FY13 As of 9/1/12</th>
<th>FY14 As of 9/1/13</th>
<th>FY15 As of 9/1/14</th>
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<tbody>
<tr>
<td>ENDOWMENT : CHAIR</td>
<td>MARKET VALUE</td>
<td>MARKET VALUE</td>
<td>MARKET VALUE</td>
<td>MARKET VALUE</td>
<td>MARKET VALUE</td>
<td>MARKET VALUE</td>
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<tr>
<td>Rockwell Plat &amp; Soil Science Chair End</td>
<td>885,639.09</td>
<td>928,082.59</td>
<td>965,922.04</td>
<td>939,719.66</td>
<td>987,501.35</td>
<td>924,979.31</td>
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<td>J Thornton Chair</td>
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<td>1,430,082.96</td>
<td>1,391,289.39</td>
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<td>1,462,031.95</td>
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<td>JA Love Sustainable Ag</td>
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<td>104,414.01</td>
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<td>3,506,223.15</td>
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<table>
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<th>ENDOWMENT : OPERATING</th>
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<tr>
<td>Dr. CP Mahoney Horticulture End</td>
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<tr>
<td>Agronomy Horticulture Support Qua End</td>
</tr>
<tr>
<td>BL Allen Soil Science End</td>
</tr>
<tr>
<td>Hawkins Intercoll Judg Teams Op End</td>
</tr>
<tr>
<td>Aubrey E and Doris Pilgrim End</td>
</tr>
<tr>
<td>Arthur &amp; Roberta Ematches End</td>
</tr>
<tr>
<td>Margaret Coil Floral Design End</td>
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<tr>
<td>Agronomy Horticulture Chair Qua End</td>
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<table>
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<th>ENDOWMENT : OTHERS</th>
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<td>Triumph Seed Company Grad Fel End 2</td>
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<tr>
<td>Bayer Cropscience Fellowship PSS - - - - 100,000.00</td>
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<td>Total</td>
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<tr>
<td>CATEGORY</td>
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<tr>
<td>-----------</td>
</tr>
<tr>
<td>ENDOWMENT : PROFESSORSHIPS</td>
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<tr>
<td>Dean Leidigh Mem Prof End</td>
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<td>Rockwell Horticulture Prof End</td>
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<td>Bayer Cropscience Reg Prof Qua End</td>
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<tr>
<td>ENDOWMENT : SCHOLARSHIPS</td>
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<tr>
<td>George &amp; Malcom Young End</td>
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<tr>
<td>AW Young Sch End</td>
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<td>Texas Assoc of Agri Consult Sch End</td>
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<td>Clyde Brian Virginia Butler Sch End</td>
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<td>Leland Chandler Sch End</td>
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<td>David Koepppe Mem Sch End</td>
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<td>Robert R Reed T V Munson Sch End</td>
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<td>Wilson &amp; Ann Holden Sch End</td>
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<td>Jack R Gipson Mem Sch End</td>
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<td>Don Ator Mem Sch End</td>
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<td>Charles Weddle RWLM End Sch</td>
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<td>Frederick &amp; Mary Gohike End Sch</td>
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<td>Greg H Westmoreland End Sch</td>
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<td>Greg Fugitt TX Turfgrass End Sch</td>
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<td>Delta &amp; Pine Land Scholarship</td>
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<td>Delbert &amp; Patricia Hess End Sch</td>
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Plant and Soil Sciences
<table>
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<td>Tx Seed TRD Cottonseed Sship End</td>
<td>8,013.84</td>
<td>8,411.03</td>
<td>8,765.09</td>
<td>8,530.55</td>
<td>8,964.30</td>
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<tr>
<td>Davidson Fdn Water Conserv Sch End</td>
<td>-</td>
<td>53,925.20</td>
<td>55,430.92</td>
<td>53,889.87</td>
<td>56,629.99</td>
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</tr>
<tr>
<td>WTACI Adolph Hanslik Sch End</td>
<td>-</td>
<td>-</td>
<td>50,074.37</td>
<td>48,682.52</td>
<td>51,157.87</td>
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<tr>
<td>Ellen B Peffley Endowed Sch</td>
<td>-</td>
<td>-</td>
<td>8,467.43</td>
<td>9,871.03</td>
<td>10,372.94</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>1,139,001.31</strong></td>
<td><strong>1,269,502.93</strong></td>
<td><strong>1,380,028.42</strong></td>
<td><strong>1,386,835.03</strong></td>
<td><strong>1,486,655.21</strong></td>
<td><strong>1,630,711.61</strong></td>
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<tr>
<td><strong>Grand Total</strong></td>
<td><strong>6,419,205.80</strong></td>
<td><strong>6,980,197.02</strong></td>
<td><strong>7,401,555.81</strong></td>
<td><strong>7,322,515.61</strong></td>
<td><strong>7,789,539.96</strong></td>
<td><strong>8,351,965.18</strong></td>
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</tbody>
</table>
F. Departmental resources for research and teaching (i.e., classroom space, lab facilities)

![Table]

G. HEAF expenditures

<table>
<thead>
<tr>
<th></th>
<th>Labs</th>
<th>Classroom</th>
<th>Other (Identify)</th>
<th>TOTAL</th>
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<tr>
<td>FY 2015</td>
<td>X</td>
<td>X</td>
<td>Upgrade greenhouse</td>
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<td>FY 2014</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>$41,024</td>
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<tr>
<td>FY 2013</td>
<td>X</td>
<td>-</td>
<td>Convert workroom into office</td>
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<tr>
<td>FY 2012</td>
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<tr>
<td>FY 2010</td>
<td>X</td>
<td>-</td>
<td>Upgrade greenhouse</td>
<td>$20,745</td>
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</table>

H. External Program Accreditation – Name of body and date of last program accreditation review, if applicable. Include description of body and accreditation specifics.

*Not applicable*
I. Describe any Centers or Institutes within the unit and how they contribute to or benefit the graduate programs?

Part of the Plant and Soil Science Department within the College of Agricultural Sciences and Natural Resources, the Fiber and Biopolymer Research Institute (FBRI) is one of the premier institutes of Texas Tech University. Its history is an integral part of the history of the natural fibers industry of Texas, especially cotton. Texas accounts for about 60% of the U.S. acres devoted to cotton and if it were a separate country, it would be the sixth largest cotton producing country in the world. Accordingly, the FBRI has long had the mission of being the leader of research, education, and development to enhance the use-value of cotton.

Of course cotton is a cellulose-based polymer and there has been a progression of the research program into other cellulose-based polymers, protein-based polymers, and various other bio-based polymers. Currently, the FBRI’s program of work encompasses molecular and fine structural research of fibers and other biopolymers, carried through to the phenomics (how genetics and environment interact to influence phenotype) of natural fibers, continuing into the functionalization of biopolymers with specialized chemical and nanotech finishes, and reaching into economic value and product development issues. Structurally, this requires teamwork among a biopolymer research lab; a cell-wall research lab; a chemistry lab; a fiber, yarn and fabric evaluation lab; and a processing lab that can transform raw fibers into finished fabrics.

The Fiber and Biopolymer Research Institute has for many years been a leader in interdisciplinary, collaborative research. The Institute consists of a thoroughly interdisciplinary faculty, with Ph.D. degrees in chemistry, fiber technology, molecular biology, and agricultural economics. The record shows significant interdisciplinary collaborations with the following entities:

- Departments of Texas Tech University: Plant & Soil Science; Agricultural Economics; Design; Electrical and Computer Engineering; Chemical Engineering; Industrial Engineering; Computer Science; Biological Sciences; Chemistry & Biochemistry; Mathematics & Statistics.
- Agricultural Research Service, U.S. Dept. of Agriculture: Cropping Systems Research Laboratory; Cotton Production & Processing Unit; Southern Regional Research Center.
- Texas A&M University and Texas AgriLife Research: Department of Soil and Crop Sciences; Research and Extension Center at Lubbock.
- University of Texas: Department of Human Ecology.
- Oklahoma State University: Institute of Agricultural Biosciences; Southwest Research and Extension Center
- Private Corporations: Bayer CropScience; Bayer Material Science; Monsanto; Phytogen Seed Company (of Dow AgroSciences); Parkdale Mills; Gildan; Cvidian; Goetz & Sons, Inc.; T. J. Beall; Crane Currency, etc.

The FBRI is located on a dedicated campus with almost 30 acres of land and a building with 100,000 square feet of conditioned space. It has 12,000 square feet of laboratories that are ambient-condition controlled around the clock at 70 °F and 65% RH.
Contained within the laboratories are a diversity of specialized machines and instruments that enable an expansive research program. The FBRI generates a significant percentage of the total sponsored research (ORS TTU only) and of the number of research assistants of the PSS Department as shown in the tables below. In addition, FBRI generates revenues through Texas A&M AgriLife Research (one faculty has a joint appointment) and through fiber testing for both the public sector and the private sector.

### FBRI Sponsored Research

<table>
<thead>
<tr>
<th></th>
<th>FBRI</th>
<th>PSS without FBRI</th>
<th>Total Sponsored Research (FBRI + PSS)</th>
<th>FBRI in % Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>$1,361,963</td>
<td>$2,778,424</td>
<td>$4,140,387</td>
<td>33%</td>
</tr>
<tr>
<td>2010</td>
<td>$517,327</td>
<td>$5,582,979</td>
<td>$6,100,306</td>
<td>8%</td>
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<tr>
<td>2011</td>
<td>$2,454,954</td>
<td>$2,196,414</td>
<td>$4,651,368</td>
<td>53%</td>
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<tr>
<td>2012</td>
<td>$1,586,482</td>
<td>$2,901,005</td>
<td>$4,487,487</td>
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<tr>
<td>2013</td>
<td>$2,031,573</td>
<td>$1,047,455</td>
<td>$3,079,028</td>
<td>66%</td>
</tr>
<tr>
<td>2014</td>
<td>$1,443,510</td>
<td>$3,304,002</td>
<td>$4,747,512</td>
<td>30%</td>
</tr>
<tr>
<td>2015</td>
<td>$553,918</td>
<td>$2,390,944</td>
<td>$2,944,862</td>
<td>19%</td>
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</tbody>
</table>

### FBRI Research Assistants

<table>
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<tr>
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<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
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<tbody>
<tr>
<td>PSS RA</td>
<td>39</td>
<td>51</td>
<td>44</td>
<td>40</td>
<td>45</td>
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<tr>
<td>FBRI RA</td>
<td>10</td>
<td>12</td>
<td>11</td>
<td>9</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Total RA</td>
<td>49</td>
<td>63</td>
<td>55</td>
<td>49</td>
<td>59</td>
<td>51</td>
</tr>
<tr>
<td>FBRI in % Total</td>
<td>20.4</td>
<td>24.5</td>
<td>22.4</td>
<td>18.4</td>
<td>28.6</td>
<td>30.6</td>
</tr>
</tbody>
</table>

Plant and Soil Sciences
VI. Conclusion – a one- to two-page summary of the observed deficiencies and needs identified by your review. Identify areas of greatest need and areas of significant contributions.

The Plant and Soil Science Department currently supports the following graduate programs:

- Graduate certificates in: Crop Protection, Fibers and Biopolymers, Horticultural Landscape Management, and Soil Management. These certificates are offered both on-campus and at-a-distance.
- Master of Science (MS) degrees in: (1) Plant and Soil Science with the following specialization areas: Crop Protection, Crop Science, Fibers and Biopolymers, and Soil Science, and (2) Horticulture. Master of Science degree students in Plant and Soil Science or Horticulture may pursue either a non-thesis or a thesis option. These degrees are offered both on campus and at-a-distance.
- Doctor of Philosophy (PhD) degree in Plant and Soil Science, with the following specialization areas: Crop Protection, Crop Science, Fibers and Biopolymers, Horticulture, and Soil Science.

Our PhD program was restructured in 2009. This was followed by a restructuring of the MS programs in 2013 and a restructuring of the BS programs in 2014. This new structure makes our overall offerings more coherent and flexible as it allows us to adjust our offerings in the future without having to create or to delete programs, i.e., adding or removing a specialization does not require permission from the THECB. B.S., M.S., and Ph.D. programs have the same name and under each are a series of areas of emphasis. Only one program, M.S. in Horticulture, is a stand-alone program because of the very specific population interested in this degree. Our programs and our faculty population have evolved significantly over the last decade. Therefore, there is a need to carefully review and adjust our curriculum to verify its adequacy to our core mission. This very time consuming task has been initiated in 2015.

During the period 2009-2015, our undergraduate program grew from 113 to 149 (+32%) while the graduate program enrollment remained about constant (around 90 students). We had a peak in graduate enrollment in 2011 (103 students). Then, due to the economic slowdown and the resulting decrease in research funding, we went back to 90 students. A very interesting evolution since 2012 is the number of Ph.D. students vs. M.S. students. Thirty two percent of our graduate students were enrolled in the Ph.D. program in 2012 while we reached 51% in the fall of 2015. In 2014, this translated into a decrease (95% expressed in percent of 2009) in WSCH for the Masters and an increase (241% expressed in percent of 2009) in WSCH for the Doctoral students. Overall, M.S. + Ph.D., the increase in WSCH for the graduate programs is 24%. Part of this success is due to our recruitment strategy (Appendix K).

Another metric of interest is percentage of full time students receiving financial support from the Department. In FY2009, 64.4% of our students received support (RA+TA+GA+GPTI) against 85.1% in FY2014. The percentage of departmental graduate scholarship remained constant at 66.7%.

The PSS faculty has, on average, a high workload (22.94 in 2014 against 20.87 for CASNR, and 17.16 for TTU). The Horticulture faculty have the highest workload in the Department. For some, the workload is unreasonable. It is not a new situation. It is a recurring problem for many years. It is the reason why we need to find a way to increase the number of Horticulture FTE by at least 1 and preferably 2.
Between FY2009 and FY2014, 381.29 proposals were submitted to ORS. Among those, 296.65 were funded. This represents a 77.8% success rate (for the strictly Federal proposals, the success rate was 37.5%). When adding the grants, gifts, etc. not passing through ORS, the 21 FTE in PSS generated $7,870,908 ($374,805/FTE). This is quite a remarkable achievement. This led to an overall increase in scientific communication. For example, our number of refereed publications increased from 197 in 2009 to 274 in 2014 (+39%). Interestingly, during the same period the number of referred publications involving at least one graduate student increased from 77 to 125 (+62%). The same trend is observed for book chapters, out of 14 book chapters in 2014, 14 involved at least one graduate student. The total number of book chapters produced by our faculty increased from 5 in 2009 to 14 in 2014 (+280%). It should also be noted that 100% of the abstract/proceedings involved at least one graduate student (120 in 2009 to 149 in 2014: + 24%). This would not have been possible without a significant investment of the Department in student travel ($263,738 since September 1, 2009, not including the funds provided by the graduate school). It should be noted that in 2009, nine authors or co-authors of a referred publication at the M.S. level and 17 at the Ph.D. level were recorded. These numbers increased drastically in 2014, with 22 and 50 for M.S. and Ph.D. levels respectively (+144% and +194%).

In addition to our research grants, we have significant endowments at the Department level. Our endowment market value was $6,419,206 in FY10. It is $8,351,965 in FY15, a 30% increase. PSS is a research intensive Department with several facilities both on and off campus. In addition to the offices and laboratories on campus, PSS has a research greenhouse and horticultural garden complex, two farms (Quaker research farm and satellite farm next to the FBRI, and the New Deal research farm), and the Fiber and Biopolymer Research Institute. Some of these facilities need upgrading.

In terms of research infrastructure we also made great progress these past few years:

- The Texas Tech University System Board of Regents in December 2013 approved a $13.6 million project to design and construct a new Plant & Soil Science Building and renovate the existing Plant Sciences Building. The new Bayer Plant Science Building adds 21,122 square feet of new construction, and includes 2,440 square feet of renovation and exterior upgrades to the Department of Plant and Soil Science. The building project was funded by donations to Texas Tech, including lead contributions from Bayer CropScience. On campus, the Department of Plant and Soil Science was formerly housed in the “Old” PSS, Food Technology, Agricultural Sciences, and Experimental Science buildings. Departmental offices, teaching and research labs, along with faculty and graduate students, located in the Agricultural Science building have been relocated to the new wing and the renovated space in the old PSS building.

- We are in the process of adding about 10 acres of drip irrigated land at the Quaker farm. It will bring the total acreage to 123.5 acres (6 acres of dryland, 5.5 acres of row irrigation, and 112 acres of subsurface drip irrigation)

- In addition, we got a 10-year lease on land next to the FBRI. It will be a mix of drip irrigation, pivot, and dryland (about 75 acres total including 22.5 acres in subsurface drip irrigation).

Overall, the trend in PSS graduate programs is positive and the future looks bright. Yet, there are several areas in which increased support and programmatic improvements would benefit our programs:
• As our programs and our faculty have evolved significantly over the last decade and will continue to evolve in the months ahead (3 retirements, 1 resignation, 3 new Assistant Research Professor positions) we need to review our curriculum. We began this task in 2015 and it will take at least one additional year to complete.

• We need to resolve the problem of heavy workloads for the Horticulture faculty.

• Increased support for the distance degree programs is needed especially in terms of course design and program advertisement. Other Universities advertise heavily their distance degrees while we do not and this has a negative impact on our recruitment efforts for these degrees. A substantial percentage of the enrollment in our graduate programs is due to our distance graduate students (17%). Continued growth in distance enrollment will continue to be important for PSS. However, a lack of sustained funding to support distance programs is a significant problem.

• We recently reestablished our Advisory Board that was somewhat dormant for several years. The first meeting of the new board was held on October 30, 2015. The three PSS Advisory sub-committees each consist of four individuals carefully selected to provide input, advice, and advocate for the department of Plant and Soil Science. The three committees will meet jointly with PSS Faculty and/or staff, PSS Chair, and other TTU personal during an annual meeting. The PSS Advisory Committees will provide recommendations to the department on research, outreach, and educational activities and mission, key benchmarks, future focus and planning. They will be asked to advocate for the department to aid in strengthen its endowment, grantsmanship, technical and educational proficiency (Appendix L). We need to keep the new board aware of our projects and seek their input as much as possible.

• Our horticultural gardens around the greenhouse need to be revitalized. They serve as a teaching facility and will be a destination point for students and families visiting TTU. A redesign of the gardens is ongoing. As soon as the final design is agreed upon, a fund raising campaign will be initiated. The cost of this operation is estimated at $3 million.

• We need to upgrade the laboratories and offices in the non-renovated “old” PSS building.

• Finally, we need to continue to upgrade our research farms and the FBRI.
VII. Appendices – should include, but not be limited to, the following:

Table of Contents

a. Strategic plan
   - Attachment from Strategic Planning website
b. Curriculum Map (table)
c. 18 Characteristics
d. Graduate Course Offerings (table)
e. Graduate Student Handbook
f. Graduate Student Association(s) – Description and Information
g. Graduate Faculty 6-Year Resumes (obtained from digital measures)
h. GRE Revised General Test Scores
i. Unit Assessment Report from TRACDAT
j. Courses cross listed (TANDEM)
k. Recruiting plan for the academic year 2014-2015
l. PSS advisory committees
APPENDIX A

Strategic Plan

Our departmental strategic plan is located at the following website:

http://www.pssc.ttu.edu/strategicplan/PSSStrategicPlan.pdf
APPENDIX B

Curriculum Map
## M.S. in Plant and Soil Science

### Texas Tech University Program Level - Curriculum Map

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Fall</th>
<th>Spring</th>
<th>Fall</th>
<th>Spring</th>
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<td>PSS 5301</td>
<td>Plant Breeding</td>
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<td>PSS 5311</td>
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<tr>
<td>PSS 5314</td>
<td>Plant &amp; Soil Pollut</td>
<td>3</td>
<td></td>
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</tr>
</tbody>
</table>

### Program Learning Outcomes

1. Demonstrate knowledge of the fundamental principles of plant and soil sciences.
2. Demonstrate proficiency in analytical and problem-solving skills.
3. Demonstrate proficiency in critical thinking and decision-making.
4. Demonstrate proficiency in effective communication and collaboration.
5. Demonstrate proficiency in professional and ethical conduct.

### Requirements

- 36 credit hours
- At least 18 credit hours in residence
- A minimum GPA of 3.0
- A minimum score on the Graduate Record Examination (GRE) or the Miller Analogies Test (MAT)

### Additional Information

- Students must complete a comprehensive examination or a thesis.
- Students must maintain a minimum GPA of 3.0 throughout the program.
- Students must complete a minimum of 30 credit hours in plant and soil sciences.
- Students must complete a minimum of 9 credit hours in electives.

### Program Completion

- Program completion requires a minimum of 36 credit hours.
- Program completion requires a minimum GPA of 3.0.
- Program completion requires a minimum score on the Graduate Record Examination (GRE) or the Miller Analogies Test (MAT).
# M.S. in Plant and Soil Science (continued)

<table>
<thead>
<tr>
<th>Course/Sequence</th>
<th>M.S. Program</th>
<th>Degree Title</th>
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<td>Degree Title</td>
<td>Degree Title</td>
<td>Degree Title</td>
<td>Degree Title</td>
</tr>
</tbody>
</table>

**Selected Program Learning Outcomes**

- Students will demonstrate a thorough understanding of the basic principles of plant and soil science.
- Students will be able to design and conduct scientific experiments to address questions in plant and soil science.
- Students will be able to analyze data and interpret results to draw meaningful conclusions.
- Students will be able to communicate the results of their research effectively, both orally and in writing.
- Students will be able to apply their knowledge to solve complex problems in plant and soil science.
- Students will be able to work effectively in multidisciplinary teams.
- Students will be able to identify and pursue opportunities for professional development and career advancement.

**Course Descriptions**

- **PS 5201**: Plant and Soil Science: Fundamentals of Aquatic and Wetland Systems
- **PS 5203**: Soil Science: Principles of Soil Science
- **PS 5205**: Plant Science: Principles of Plant Physiology
- **PS 5425**: Plant Pathology: Principles of Plant Pathology

**Course Details**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
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<td>Plant and Soil Science: Fundamentals of Aquatic and Wetland Systems</td>
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<td>PS 5203</td>
<td>PS 5205</td>
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<tr>
<td>PS 5203</td>
<td>Soil Science: Principles of Soil Science</td>
<td>3</td>
<td>PS 5201</td>
<td>PS 5205</td>
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<tr>
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<td>Plant Science: Principles of Plant Physiology</td>
<td>3</td>
<td>PS 5201</td>
<td>PS 5203</td>
</tr>
<tr>
<td>PS 5425</td>
<td>Plant Pathology: Principles of Plant Pathology</td>
<td>3</td>
<td>PS 5203</td>
<td>PS 5205</td>
</tr>
</tbody>
</table>

**Course Objectives**

- Develop a comprehensive understanding of the basic principles of plant and soil science.
- Design and conduct scientific experiments to address research questions in plant and soil science.
- Analyze data and interpret results to draw meaningful conclusions.
- Communicate the results of research effectively, both orally and in writing.
- Apply knowledge to solve complex problems in plant and soil science.
- Work effectively in multidisciplinary teams.
- Identify and pursue opportunities for professional development and career advancement.
# M.S. in Horticulture

## Texas Tech University Program Level - Curriculum Map

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Corequisites</th>
<th>Notes</th>
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## Plant and Soil Sciences

Based on the National Science Foundation's 2021 report, the M.S. in Horticulture program at Texas Tech University focuses on providing students with a comprehensive understanding of plant and soil sciences. The curriculum includes courses in horticultural sciences, plant pathology, advanced botany, and forest management. Students are prepared to conduct research and apply their knowledge in the field of horticulture.
# Ph.D. in Plant and Soil Science

## Texas Tech University Program Level - Curriculum Map

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Based on the course credits and departmental requirements, the students are expected to complete a minimum of a specific number of credits in each area. The actual number of credits required may vary depending on the student's specialization and program. Students will be advised by their advisor to plan their course of study accordingly.
### Ph.D. in Plant and Soil Science (continued)

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**SELECTED PROGRAM LEARNING OUTCOMES**

- Students will demonstrate knowledge and understanding of plant and soil sciences.
- Students will demonstrate the ability to design and execute research protocols using appropriate statistical methods.
- Students will demonstrate the ability to apply statistical methods to solve problems in plant and soil sciences.
- Students will demonstrate the ability to communicate research findings effectively to a broad audience.
- Students will demonstrate the ability to apply statistical methods to solve problems in plant and soil sciences.
## APPENDIX C

### 18 Characteristics

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<th>Number of Degrees Per Year</th>
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<th>FY 2012-2013</th>
<th>FY 2013-2014</th>
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<td>For each of the three most recent years, average of the graduates' time to degree.</td>
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<th>Fall 2013</th>
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</tr>
<tr>
<td>Employed in Academia</td>
<td>10</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Employed as Post-Doctorates</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Employed in Industry/Professional</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Employed in Government</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Still seeking employment</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unknown</td>
<td>9</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Programs included only if in existence 3 or more years. Program is defined at the 8-digit CIP code level.
<table>
<thead>
<tr>
<th>Admissions Criteria</th>
<th>Description of Admission Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of Full-time Students</td>
<td>Fall 2011</td>
</tr>
<tr>
<td>FTS *number students enrolled (headcount) for last three fall semesters.</td>
<td></td>
</tr>
<tr>
<td>*Definition of Full Time Student (FTS) is institutional by program.</td>
<td>88.9%</td>
</tr>
</tbody>
</table>

| Average Institutional Financial Support Provided | Fall 2011 | Fall 2012 | Fall 2013 |
| For those receiving financial support, the average monetary institutional support provided per full-time graduate student for the prior year from assistantships, scholarships, stipends, grants, and fellowships (does not include tuition or benefits). Note: This number represents the weighted average monthly salary of all Research & Teaching Assistants and Graduate Part-Time Instructors. | 1850/month | 1850/month | 1850/month |

| Percentage Full-time Students with Institutional Financial Support | Fall 2011 | Fall 2012 | Fall 2013 |
| In the prior year, the number of FTS with at least $1000 of annual support the number of FTS. | |

| Number of Core Faculty* | Fall 2011 | Fall 2012 | Fall 2013 |
| Number of core faculty in the prior years | 23 | 20 | 23 |
| *Core faculty: Full-time tenured and tenure-track faculty who teach 50 percent or more in the doctoral program or other individuals integral to the doctoral program who are granted a temporary appointment. |

| Student-Core Faculty Ratio | Fall 2011 | Fall 2012 | Fall 2013 |
| For each of the three most recent years, average of full-time student equivalent (FTSE)/average of full-time faculty equivalent (FTFE) of core faculty | 0.64 | 0.78 | 1.73 |

| Core Faculty Publications | Calendar Year 2011 | Calendar Year 2012 | Calendar Year 2013 |
| For each of the three most recent calendar years, average of the number of discipline-related refereed papers/publications, books/book chapters, juried creative/performance accomplishments, and notices of discoveries filed/patents issued per core faculty member. | 84 | 74 | 95 |
| Referred Papers/Publications | 9 | 7 | 10 |
| Books/Book Chapters | 0 | 0 | 0 |
| Juried Creative/Performance Accomplishments | 8 | 0 | 0 |
| Notices of Discoveries/Filed/Patents |

<p>| Core Faculty External Grants | Fall 2011 | Fall 2012 | Fall 2013 |
| For each of the three most recent years, average of the number of core faculty receiving external funds, average external funds per faculty, and total external funds per program per academic year* | 17 | 18 | 20 |
| All external funds received by core faculty from any source including research grants, training grants, gifts from foundations, etc., reported as expenditures. | $234,980 | $200,988 | $237,376 |
| Number of Core Faculty receiving external funds | $2,901,005 | $2,754,624 | $4,747,511 |
| Average External Grant $ per Faculty |
| Total External Grant $ |</p>
<table>
<thead>
<tr>
<th>Faculty Teaching Load</th>
<th>Fall 2011</th>
<th>Fall 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of semester credit hours in organized teaching courses taught per academic year by core faculty divided by the number of core faculty.</td>
<td>273</td>
<td>270</td>
<td>96</td>
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<table>
<thead>
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<th>Faculty Diversity</th>
<th>Fall 2011</th>
<th>Fall 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core faculty by ethnicity (White, Black, Hispanic, other) and gender.</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>White</td>
<td>28</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Other</td>
<td>8</td>
<td>2</td>
<td>3</td>
</tr>
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<table>
<thead>
<tr>
<th>Student Diversity</th>
<th>Fall 2011</th>
<th>Fall 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment headcount by ethnicity (White, Black, Hispanic, Other) and gender in program.</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>White</td>
<td>8</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>3</td>
<td>10</td>
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</table>

<table>
<thead>
<tr>
<th>Date of Last External Review</th>
<th>2/24/2010</th>
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</thead>
<tbody>
<tr>
<td>Date of last formal external review</td>
<td>2/24/2010</td>
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</table>

<table>
<thead>
<tr>
<th>External Program Accreditation</th>
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</thead>
<tbody>
<tr>
<td>Name of body and date of last program accreditation review, if applicable.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Publications/Presentations</th>
<th>Calendar Year 2011</th>
<th>Calendar Year 2012</th>
<th>Calendar Year 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the three most recent calendar years, the number of discipline-related refereed papers/publications, juried creative/performing accomplishments, book chapters, books, and external presentations per year by student FTE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refereed Papers/Publications</td>
<td>25</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Juried Creative/Performance Accomplishments</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Book Chapters</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Books</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>External Presentations</td>
<td>61</td>
<td>28</td>
<td>52</td>
</tr>
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</table>
APPENDIX D
Graduate Course Offerings

Our graduate course offerings are located at the following website:

http://www.depts.ttu.edu/officialpublications/courses/pss.php
APPENDIX E

Graduate Student Handbook

Our graduate student handbook can be viewed at

http://www.pssc.ttu.edu/ProgramPages/Files/grad%20handbook.pdf
APPENDIX F

Graduate Student Association(s)

The Department of Plant and Soil Science has one graduate student association, the Plant and Soil Science (PSS) Graduate Student Council. The PSS Graduate Student Council represent the many graduate students of the department, encouraging fellowship, promote research and presentations, and hosting events of interest in the graduate students.

Most PSS Graduate Student Council meetings are held monthly, and discuss any business or items that should be planned by the Council. The Council assists the department with New Graduate Student Orientation each Fall and Spring semesters, volunteers time for departmental events as needed, and hosts guest lecturers or tours periodically.

Plant and Soil Science Graduate Council

Constitution and Bylaws

Article I

The name of this organization shall be: Plant and Soil Science Graduate Council, hereafter referred to as the PSS Graduate Council. The society’s colors are green, white, and brown.

Article II Purpose

The purpose of this organization shall be: to represent Plant and Soil Science (PSS) graduate students and address their interests and concerns; to pursue improvements in quality of research and education; to promote meetings and events fostering mutual exchange of ideas and strengthening fellowship among PSS Graduate Students.

Article III Membership

Any PSS graduate student, currently enrolled at Texas Tech University, who is interested in the promotion of PSS graduate student interests at Texas Tech University is eligible for membership. Dues will be voted on during the Spring semester officer elections of each year.
Each active member in good standing has the right to one vote per office or order of business. It is the responsibility of the member to remain active so that they may be well informed of the matters of business of the PSS Graduate Council.

If a member chooses to behave in a manner that negatively affects the image or reputation of the PSS Graduate Council, they will be subject to expulsion. Before a formal expulsion can take place, a meeting will be set with one week notice to give the member the opportunity to explain the situation to the executive committee and advisor(s). At that time the executive committee and advisor(s) will discuss the situation and decide whether or not to proceed with the expulsion.

**Article IV Meetings**

The regular business meetings of the PSS Graduate Council shall be held at the time and place as determined by the Executive Committee.

**Article V Officers**

Holding office shall be restricted to PSS graduate students who are active members of the PSS Graduate Council. The officers shall be President, Vice-President, and Treasurer. The election of officers shall be conducted at a regular business meeting. Regular annual officer elections will be conducted during spring semester with a minimum of two weeks prior notice. Nominations may be made from the floor (in an informal manner). The Executive Committee will be elected for one year terms. All officers associated with this society should be students of the institution for the duration of their elected or appointed term.

The Executive Committee has the responsibility to conduct the affairs of the PSS Graduate Council in the interval between regular business meetings, and make recommendations for program presentations and other activities pertaining to the welfare of the PSS Graduate Council. The Executive Committee shall consist of the three elected officers. The President shall serve as chairperson.

Duties of officers: Since this organization is designed for the PSS graduate student body, officers of this organization shall be PSS graduate students.

The President shall preside at general sessions and business meetings of the PSS Graduate Council and as an ex-officio member of all standing committees. The President shall enforce the Bylaws of this organization.

The Vice-President shall keep a permanent record book in which the proceedings of each meeting shall be recorded. The Vice-President shall at each meeting, read the minutes of the preceding meeting. The Vice-President shall preside in the absence of the President.
The Treasurer shall keep a permanent record ledger in which all accounts shall be recorded; disburse all funds as directed by the PSS Graduate Council or Executive Committee; and prepare a written report for presentation at the regular meetings.

If the Vice-President or Treasurer resigns before their year term is fulfilled, an election will be held at the next regular meeting for an interim officer to take the place of the previous Vice-President or Treasurer. This election will be overseen by the President. If the President resigns, it will be the Vice-President’s duty to fulfill the President’s position. At that point an interim officer will be elected to serve as Vice-President. An interim officer will hold their position until the time for normal spring elections when they may choose to run for a full term officer position.

Special committees, when approved by the Executive Committee, shall be appointed by the President. These committees shall address specific topics of interest of this Council and its members. The President shall also appoint committee chairpersons.

An advisor for the PSS Graduate Council will be determined at the time of new officer elections in the spring semester of each year. The advisor must be a full-time faculty or staff of Texas Tech University and have an interest in the concerns of the PSS Graduate Council. The advisor will serve a one year term, but there is no limit to the number of terms that can be served. It will be the advisor’s duty to attend all meetings and offer their advice and guidance when needed, and to work closely with the Executive Committee to achieve the purpose of the PSS Graduate Council.

**Article VI Amendments**

To amend the constitution, members must be given at least two weeks prior notice. This constitution may then be amended at a regular business meeting by two-thirds vote of the members present.
APPENDIX G

GRADUATE FACULTY 6-YEAR RESUMES
Dr. Noureddine Abidi  
Texas Tech University  
(806) 742-5333  
n.abidi@ttu.edu

Education and Post Graduate Training

HDR, University Haute Alsace, 2007.  
Major: Engineering Science

Postdoctoral, University Montpellier II, 1999.

Ph D, University Montpellier II, 1996.  
Major: Theoretical, Physical, and Analytical Chemistry

University Montpellier II, 1993.  
Major: Polymers, Interfaces, Amorphous States, Dipl. App. Studies

MS, Oujda Faculty of Sciences, 1992.  
Major: Chemistry

BS, Oujda Faculty of Sciences, 1991.  
Major: Chemistry

Academic and Professional Experience

Associate Professor, Texas Tech University. (September 1, 2012 - Present).

Fiber and Biopolymer Research Institute, Head of Biopolymer Research. (2008 - Present).

Assistant Professor, Texas Tech University. (September 1, 2009 - August 31, 2012).

Research Assistant Professor, Texas Tech University. (2006 - 2009).


Leadership Awards and Honors

Texas Tech University Outstanding Research Award, TTU. (2013).

TEACHING

Courses Taught

Texas Tech University

PSS 4001, Problems, 4 courses.
PSS 5001, Problems in PSS: Hybrid Organic-Inorganic Aerogels, 6 courses.
PSS 5371, Structure and Functionalization of Cotton Fibers, 8 courses.
PSS 5373, Biopolymers and Bioproducts, 8 courses.
PSS 6000, Master’s Thesis, 18 courses.
PSS 6001, Selected Topics in Plant and Soil Science, 14 courses.
PSS 7000, Research, 22 courses.
PSS 8000, Doctor’s Dissertation, 11 courses.

**Directed Student Learning**

Sanjit Acharya, Dissertation Committee Chair, Plant & Soil Science. (August 2013 - Present).

Tanya Jackson, Master’s Thesis Committee Chair, "Organic-Inorganic hybrid aerogels." (2015).

Brendan Kelly, Dissertation Committee Member, Plant & Soil Science. (2014).

Benjamin Murphy, Master’s Thesis Committee Chair, "Crop Science at a Distance." (2014).

Shayamalee Abeysinghe, Master's Thesis Committee Chair, "Cotton fabric functionalization to impart wrinkle free properties." (2014).

Shayamalee Abeysinghe, Master's Thesis Committee Chair, "Cellulose crosslinking with Cellulose Binding Domains proteins," Plant & Soil Science. (September 1, 2013 - 2014).

Tanya Jackson, Master’s Thesis Committee Chair, "Preparation and characterization of hybrid organic-inorganic aerogels.," Plant & Soil Science. (January 2012 - 2014).

Holli Myers, Master's Thesis Committee Member, Plant & Soil Science. (2013).

Sumedha Liyanage, Master's Thesis Committee Chair, "Chemical and physical characterization of galactomanns extracted from guar seeds.," Plant & Soil Science. (October 18, 2013).

Maheshika Herath, "Cellulose structural organization during different phases of fiber development investigated by X-Rays Diffraction," Plant & Soil Science. (October 17, 2013).


Roji Manandhar, Dissertation Committee Member, Plant & Soil Science. (October 9, 2013).

Zhuanzhuan Ma, Master's Thesis Committee Chair, "Investigating the impact of drought stress on cotton fiber properties," Plant & Soil Science. (August 2013).

Shanshan Li, Master's Thesis Committee Chair, "Preparation and characterization of cellulose-based aerogels," Plant & Soil Science. (March 25, 2013).

Mark Schoonover, Master's Thesis Committee Member, Plant & Soil Science. (October 16, 2012).

Sanjit Acharya, Master's Thesis Committee Chair, "Dyeing properties of cotton fibers with improved reactivity," Plant & Soil Science. (July 2012).

Ruwanti Wettasinghe, Dissertation Committee Member, Plant & Soil Science. (June 21, 2012).

Dev Paudel, Master's Thesis Committee Member, Plant & Soil Science. (June 21, 2012).

Farzad Hosseinali, Master's Thesis Committee Member, Plant & Soil Science. (June 15, 2012).
James Hodgson, Master's Thesis Committee Member, Plant & Soil Science. (June 1, 2012).

Luis Cabrales, Dissertation Committee Chair, "Analytical and spectroscopic approaches to study cellulose macromolecules in developing cotton fibers," Plant & Soil Science. (October 2011).

Natalia Castillo, Dissertation Defense Committee Member, Plant & Soil Science. (July 25, 2011).

Payam Aminayi, Master's Thesis Committee Chair, "Imparting super hydro/oleo phobic properties to cotton fabric by means of Molecular Vapor Deposition," Plant & Soil Science. (June 2011).


Neha Kothari, Master's Thesis Committee Chair, "Multidisciplinary approach to study cotton fiber development." (October 2007).

**RESEARCH**

**Published Intellectual Contributions**

**Book, Chapter in Scholarly Book-New**


**Journal Article, Academic Journal**


**Journal Article, Professional Journal**


**Presentations Given**


Abidi, N. (Presenter & Author), Cabrales, L. (Author Only), Hequet, E. (Author Only), 239th American Chemical Society National Meeting & Exposition, "Secondary cell wall development


**Contracts, Grants and Sponsored Research**

Abidi, N. (Co-Principal), "Determination of individual fibers tensile properties: relationships with bundle strength maturity, length distribution, and fiber breakage," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, $30,000.00. (September 1, 2009 - August 31, 2010).

Abidi, N. (Principal), "Imparting antibacterial property to cotton fabric through functionalization with cyclodextrins," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, $35,000.00. (September 1, 2008 - August 31, 2009).

**Contract**


Abidi, N. (Principal), "Research to enhance the quality and competitiveness of Texas cotton fibers," Sponsored by Texas Department of Agriculture, $18,000.00. (September 1, 2011 - June 30, 2013).


Abidi, N. (Co-Principal), "Bringing a portion of Texas plains cotton into premium yarn market," $51,517.00. (September 1, 2010 - August 31, 2011).


Abidi, N. (Co-Principal), "Determination of individual fibers tensile properties: relationships with bundle strength maturity, length distribution, and fiber breakage," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, State, $18,215.00. (September 1, 2010 - August 31, 2011).


Abidi, N. (Principal), "Multidisciplinary approach to study cotton fiber maturity," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, State, $34,474.00. (September 1, 2010 - August 31, 2011).


Abidi, N. (Co-Principal), "Optimizing the use of the Advanced Fiber Information System," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, State, $27,323.00. (September 1, 2010 - August 31, 2011).

Abidi, N. (Principal), "International Cotton Research Center Program," Sponsored by USDA, $32,386.00. (September 1, 2009 - August 31, 2010).

Abidi, N. (Co-Principal), "Optimizing the use of the Advanced Fiber Information System," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, $30,000.00. (September 1, 2009 - August 31, 2010).


Abidi, N. (Co-Principal), "Evaluation of testing methods for cotton breeders and biotechnologists with special emphasis on cotton fiber maturity," Sponsored by Cotton Incorporated, $100,971.00. (January 1, 2009 - December 31, 2009).


Abidi, N. (Co-Principal), "Incorporating fiber elongation in cotton breeding programs," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, $30,389.00. (September 1, 2008 - August 31, 2009).
Abidi, N. (Principal), "Multidisciplinary approach to study cotton fiber maturity," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, $35,000.00. (September 1, 2008 - August 31, 2009).

Abidi, N. (Co-Principal), "Single fiber strength, crimp, and linear density measurements using FAVIMAT," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, State, $20,753.00. (September 1, 2008 - August 31, 2009).


Grant


Abidi, N. (Co-Principal), "MRI: Acquisition of a nanocoating system for engineering surfaces," Sponsored by National Science Foundation, $275,000.00. (August 1, 2008 - July 31, 2011).


Abidi, N. (Principal), "Multidisciplinary approach to study cotton fiber maturity," Sponsored by Texas Department of Agriculture/Food and Fiber Research Program, $29,280.00. (September 1, 2009 - December 31, 2009).


Intellectual Contributions in Submission

Journal Article, Academic Journal


Journal Article, Professional Journal


Research in Progress

"Cell wall Biochemistry" (On-Going)

"Evaluation of the feasibility to engineering wrinkle as new trait in cotton fiber" (On-Going)

"Improving fiber testing methods for cotton breeders" (On-Going)

"Spectroscopic approach to study cotton fiber maturity" (On-Going)

"Bioremediation of used cotton oil sorbents using enzyme technology" (Planning)
Cotton oil sorbents can be bioremediated enzymatically, releasing the retained oil and degrading the sorbent, thus keeping both entities out of landfills. The recovered oil can be placed back into the product stream.

SERVICE

College Service

Committee Chair, CASNR International Activities Commitee. (September 1, 2013 - Present).

GENERAL

Professional Memberships


American Chemical Society. (April 1, 2000 - Present).
American Association of Textile Chemists and Colorists. (January 1, 2000 - Present).

Secretary, Cellulose Division of The American Chemical Society. (January 1, 2010 - December 31, 2012).
Dick Auld
Texas Tech University
dick.auld@ttu.edu

Education and Post Graduate Training

Ph D, Montana State University, 1976.
  Major: Plant Science, Genetics and Breeding

MS, New Mexico State University, 1974.
  Major: Agronomy and Plant Breeding

BS, New Mexico State University, 1970.
  Major: Agronomy

Academic and Professional Experience

Rockwell Professor, Texas Tech University. (2006 - Present).

Professor and Department Chair, Texas Tech University. (1991 - 2006).

Leadership Awards and Honors

Institutional Award, West Texas Agricultural Chemicals Institute. (2014).

Outstanding Service to Agriculture, Gamma Sigma Delta. (2014).

TEACHING

Courses Taught

Texas Tech University
  PSS 1100, Freshman and Transfer Student Seminar, 3 courses.
  PSS 1321, Agronomic Plant Science, 4 courses.
  PSS 3322, Grain, Fiber, and Oilseed Crops, 3 courses.
  PSS 3421, Fundamental Principles of Genetics, 8 courses.
  PSS 4001, Problems, 8 courses.
  PSS 4100, Seminar, 1 course.
  PSS 4321, Fundamental Principles of Plant Breeding, 1 course.
  PSS 5001, Problems in Plant and Soil Science, 6 courses.
  PSS 5321, Plant Breeding Theory, 1 course.
  PSS 6000, Master’s Thesis, 19 courses.
  PSS 6001, Selected Topics in PSS: Major Crops of the Globe, 7 courses.
  PSS 7000, Research, 23 courses.
  PSS 8000, Doctor’s Dissertation, 20 courses.

Directed Student Learning

Bralie Hendon, Doctoral Advisory Committee Chair. "Improving cool temperature establishment in cotton by modifying the fatty acid composition." (2015).
Cody Mull, Master's Thesis Committee Chair, "Regression analyses of Cotton Advance Line Yield Trials to Improve Selection Efficiency." (2014).


Loren Davis, Master's Thesis Committee Chair, "Improving the Oil Content of Upland Cotton." (2014).

Cameron Oliver, Master's Thesis Committee Co-Chair, "Comparison of Cotton Yield Components under Three Irrigation Regimes." (2014).


Corey Thompson, Master's Thesis Committee Co-Chair, "Improving cool temperature establishment in cotton by modifying the fatty acid composition." (2013).

Liv Severino, Dissertation Defense Committee Chair, "Studies on Yield Components and Seed Physiology of Castor (Ricinus communis L.)." (2012).

Ruwanthi Wettasinghe, Doctoral Advisory Committee Co-Chair, "Development of castor (Ricinus communis) var. Brigham with ultra low ricin content by analyzing soluble seed proteins." (2012).

Bralie Hendon, Master's Thesis Committee Co-Chair, "Stabilization of the Naked Seeded Trait in Cotton." (2012).

Kevin Meeks, Master's Thesis Committee Co-Chair, "Developing salt tolerance in Safflower." (2012).


Zachary Hinds, Master's Thesis Committee Co-Chair, "Molecular Marker Analysis of Safflower." (2012).


Jacob Rieff, Master's Thesis Committee Co-Chair, "Harvest Aids to Optimize Mechanical Harvest of Castor." (2011).

Shields Margaret, Doctoral Advisory Committee Co-Chair, "The Evaluation and Inheritance of Several Traits Associated with Lint Percent in Cotton." (2010).

Tina Thomas, Doctoral Advisory Committee Co-Chair, "Methanol and Ethanol Esterification of Castor, Safflower, Cottonseed and Sunflower Oil." (2010).


Bradley Sladek, Master's Thesis Committee Co-Chair, "Shade Tolerance and Rate of Spread in Zoysiagrass cultivars." (2008).
Derek Scasta, Master's Thesis Committee Member, "Salt Tolerant Alfalfa.." (2008).

RESEARCH

Published Intellectual Contributions

Journal Article, Academic Journal


Auld, D. (2012). The influence of the Caruncle on the Germination of Castor Seed under High Salinity or Low Soil Water Content.. *Seed Science and Tech.*(40), 139-143.


**Journal Article, Professional Journal**


**Contracts, Grants and Sponsored Research**

**Grant**


**Intellectual Contributions in Submission**

**Journal Article, Academic Journal**


**Research in Progress**

"Bioremediation of used cotton oil sorbents using enzyme technology" (Planning)
Cotton oil sorbents can be bioremediated enzymatically, releasing the retained oil and degrading the sorbent, thus keeping both entities out of landfills. The recovered oil can be placed back into the product stream.
Mark Burow  
Texas Tech University  
md.burow@ttu.edu

Education and Post Graduate Training

Ph D, University of Wisconsin, Madison, 1990.  
Major: Plant Breeding/ Plant Genetics, Biochemistry  
Dissertation Title: Biochemical and Genetic Characteristics of Common Bean (Phaseolus vulgaris L.) Lines Deficient for the Seed Storage Proteins Phaseolin and Lectin

BA, St. Olaf College, 1981.  
Major: Chemistry 

Academic and Professional Experience

Professor, Texas Tech University. (September 1, 2014 - Present).

Associate Professor - Peanut Breeding and Genetics, Texas A&M University (75%), and Department of Plant and Soil Science, Texas Tech University (25%). (September 2007 - Present).  
Associate Professor - Peanut Breeding and Genetics, Sep. 2007 -present

Assistant Professor - Peanut Breeding and Genetics, Texas A&M University (75%), and Department of Plant and Soil Science, Texas Tech University (25%). (February 2001 - September 2007).  
Assistant Professor - Peanut Breeding and Genetics, Department of Soil and Crop Science, Texas A&M University (75%), and Department of Plant and Soil Science, Texas Tech University (25%), Feb. 2001- present

TEACHING

Courses Taught

Texas Tech University

PSS 3421, Fundamental Principles of Genetics, 8 courses.  
PSS 4001, Problems, 4 courses.  
PSS 5001, Problems in Plant and Soil Science, 4 courses.  
PSS 6000, Master's Thesis, 15 courses.  
PSS 6001, Selected Topics in PSS: Genomics, 7 courses.  
PSS 6424, Structural Genomics of Plants and Animals, 4 courses.  
PSS 7000, Research, 16 courses.  
PSS 8000, Doctor's Dissertation, 9 courses.

Directed Student Learning

Ratan Chopra, Master's Thesis Committee Chair. (2013).

Nicholas Denwar, Master's Thesis Committee Chair, "Evaluation of interspecific lines and breeding populations of Arachis hypogaea L. for yield and resistance to leafspot diseases in Ghana and Texas." (2011).

Jamie Ayers, Master's Thesis Committee Chair, "Determining optimal conditions for maximum peanut profitability under reduced irrigation in West Texas." (2010).

Vikas Belamkar, Master's Thesis Committee Chair, "A first insight into population structure linkage disequilibrium, and association mapping of drought tolerance-related traits in the U.S. peanut minicore collection." (2010).

**RESEARCH**

**Published Intellectual Contributions**

**Conference Proceeding**


**Journal Article, Academic Journal**


**Journal Article, Professional Journal**


**Journal, Edited Issue**


**Contracts, Grants and Sponsored Research**

**Grant**

Barbato, L. (Co-Principal), Woodward, J. (Co-Principal), Burow, M. (Co-Principal), Seshadri, S. (Co-Principal), Mulligan, K. (Co-Principal), Ballou, M. (Principal), Williams, R. (Co-Principal), Ritchie, G. (Co-Principal), Trojan, S. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies-TTU," Sponsored by U.S. Dept of Agriculture, $282,125.00. (September 1, 2012 - August 31, 2017).


Cao, G. (Co-Principal), Ballou, M. (Principal), Barbato, L. (Co-Principal), Mulligan, K. (Co-Principal), Burow, M. (Co-Principal), Williams, R. (Co-Principal), Seshadri, S. (Co-Principal), Mendu, V. (Co-Principal), West, C. (Co-Principal), Trojan, S. (Co-Principal), Ritchie, G. (Co-Principal), Woodward, J. (Co-Principal), Sarturi, J. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies-TTU," Sponsored by United States Department of Agriculture, Federal, $340,222.00. (September 1, 2014 - August 31, 2016).

**Intellectual Contributions in Submission**

**Journal Article, Academic Journal**


**Research in Progress**

"Development of Algal Culture for Biodiesel Production" (Complete) Project funded by the Strategic Fuel Supply-Department of Defense, Airforce. $197,000 total.
Collaborative project with the Texas AgriLife Research and Extension Center with M.D. Burow, A.M. Schubert, C.B. Fedler, and J.V. Moroney

"Development of the Texas Algal Fuels Research Center" (Complete) Project funded by the Department of Defense: Defense Advanced Research Projects Agency (DARPA) or $3,146,000 total for 3 years through the Texas AgriLife Research and Extension Center, $734,571 shared portion for Year 1 and Year 2 with collaborators M. Burow, M. Foster, C. Fedler, A. Kemanian, R. Lacey, and R. Srinivasan.
Sanjit Deb  
Texas Tech University  
sanjit.deb@ttu.edu  

Education and Post Graduate Training  
Ph D, University of Tokyo, Japan, 2006.  
BS, Bangladesh Agricultural University, 1996.  

Academic and Professional Experience  
Post Doctoral Fellow, New Mexico State University. (2009 - 2013).  

RESEARCH  
Published Intellectual Contributions  
Journal Article, Professional Journal  


**GENERAL**

**Professional Memberships**

member, Soil Science Society of America. (2010 - Present).

member, Gamma Sigma Delta. (2009 - Present).

member, Alumni Association of Asian Institute of Technology-Thailand. (2000 - Present).

member, American Society of Agricultural and Biological Engineers. (1999 - Present).

Education and Post Graduate Training

Ph D, University of Minnesota, 1993.
   Major: Agronomy. Emphasis: Weed Physiology

MS, Washington State University, 1989.
   Major: Agronomy. Emphasis: Weed Science

BS, University of Minnesota, 1986.
   Major: Agronomy. Emphasis: Crop Production

Academic and Professional Experience

Professor of Agronomy and Professor and Extension Weed Specialist, Texas Tech University and The Texas A&M University System. (2004 - Present).

Associate Professor of Agronomy and Associate Professor and Extension Weed Specialist, Texas Tech University and The Texas A&M University System. (1999 - 2004).
   Associate Professor of Agronomy. Department of Plant and Soil Science. Texas Tech University and Associate Professor and Extension Weed Specialist. Department of Crops and Soil Science. The Texas A&M University System.

TEACHING

Courses Taught

Texas Tech University

IS 1100, Raider Ready: Freshman Seminar: CASNR, 10 courses.
PSS 4000, Internship, 4 courses.
PSS 4001, Problems, 5 courses.
PSS 4301, Agricultural Compounds, 1 course.
PSS 4421, Principles of Weed Science, 12 courses.
PSS 5000, Professional Internship, 4 courses.
PSS 5001, Problems in Plant and Soil Science, 6 courses.
PSS 5307, Pesticides, 1 course.
PSS 5324, Mode and Mechanism of Herbicide Action, 6 courses.
PSS 5429, Advanced Principles of Weed Science, 13 courses.
PSS 6000, Master’s Thesis, 18 courses.
PSS 6001, Selected Topics in Plant and Soil Science: Weed Science Teaching Practicum, 5 courses.
PSS 7000, Research, 23 courses.
PSS 8000, Doctor’s Dissertation, 10 courses.
Directed Student Learning

Loren Davis, Master's Thesis Committee Member, "Drought tolerance in multiple cotton varieties." (December 2014).

Ryan Gregory, Master's Thesis Committee Member, "Screening Strategy for maintaining purity and seed quality in cotton (Gossypium hirsutum L.) Breeding nurseries." (December 2014).

Joshua McGinty, Dissertation Defense Committee Member, "Occurance and management of glyphosate resistant Amaranthus weed species in central Texas cotton and evaluation of spray droplet spectra as affected by nozzle design and herbicide formulation." (May 2014).

George S. Cutts, III, Dissertation Defense Committee Member, "Genetic analysis, inheritance and stability of mutation-based herbicide tolerance in cotton (Gossypium hirsutum L." (December 2013).

Justin Cave, Master's Thesis Committee Co-Chair, "Cotton lint yield, fiber quality and water use efficiency as influenced by cultivar and irrigation level." (2013).

Jacob Reed, Dissertation Committee Co-Chair, "Palmer amaranth and ivyleaf morningglory management in GlyTol plus LibertyLink Cotton." (2012).

Andrew Young, Master's Thesis Committee Co-Chair, "Continuous canopy temperatures as a tool for managing deficit irrigation." (2012).

A.J. Jephner, Master's Thesis Committee Member, "Response of khakiweed to mowing heights, compaction, and herbicides." (August 2012).

Bruce Spinhirne, Master's Thesis Committee Member, "Yield and quality response of corn silage genotypes under reduced irrigation in the Texas High Plains." (May 2012).

F.T. Cooper, Master's Thesis Committee Member, "Cultural and chemical control of bermudagrass in bentgrass greens." (May 2012).

Andrew Bloodworth, Master's Thesis Committee Co-Chair, "Weed Management and economics in cotton tillage systems." (2010).


Kris Verett, Master's Thesis Committee Co-Chair, "Cotton and weed response to propazine/glyphosate combinations." (2009).

Matt Schwertner, Master's Thesis Committee Co-Chair, "Weed Management in strip-tillage cotton." (2008).

Becker David, Dissertation Defense Committee Member, "Evaluation of transgenic cotton lines tolerant to glufosinate, bromoxynil, and both glufosinate and bromoxynil." (May 2004).

Teaching Awards and Honors

Weed Science Society of Ameria Outstanding Teacher Award. (2014).

Texas Agricultural Industries Association Outstanding Educator Award. (2012).


RESEARCH

Published Intellectual Contributions

Conference Proceeding


Journal Article, Academic Journal


Journal Article, Professional Journal


**Journal Article, Public or Trade Journal**


**Contracts, Grants and Sponsored Research**

**Grant**


SERVICE

Service Awards and Honors

Service, Professional

Extension Award, Soil and Crop Science Department Texas A&M University. (2012).

Texas County Agricultural Agents Association Specialist of the Year. (2011).

Gamma Sigma Delta Outstanding Service to Agriculture Award. (2007).

Service, University

RaiderReady First-Year Advocate and Faculty Fellowship Award. (2014).

GENERAL

Professional Memberships


Associate Editor, American Peanut Research and Education Society. (2009 - 2015).

Chair, Southern Weed Science Society. (2008).
Dr. Ashley Elle
Texas Tech University
(806) 742-2838
ashley.basinger@ttu.edu

Education and Post Graduate Training

Ph.D., Texas Tech University, 2007.
Major: Agronomy
Dissertation Title: Competency-based Curriculum for the U.S. Horticulture Undergraduate Major: A National Delphi-Study

MS, Texas Tech University, 2004.
Major: Horticulture
Dissertation Title: Evaluation of the Effects of Two Deficit Irrigation Strategies on Grapevine Cold Acclimation Hardiness, Growth Yield and Fruit Quality.

BS, Texas Tech University, 2000.
Major: Horticulture

Academic and Professional Experience

Horticulture Instructor, Texas Tech University. (September 1, 2012 - Present).

Teaching Assistant, Texas Tech University. (September 2010 - Present).
Teaching Principles of Horticulture Distance Learning Class

Horticulturist, South Plains Food Bank. (March 2010 - Present).
Plan yearly budget for farm and orchard. Write monthly reports on farm and orchard. Design yearly crop production and cover crop layouts, varieties, and crop rotations. Integrate sustainable pest management and use of least toxic pesticides.

Environmental Horticulturist, University of California, Cooperative Extension. (June 2007 - February 2010).
Developed and taught curriculum for Certifying Landscapers in Sustainable methods. Held multiple all day workshops for the Horticulture industry. Advised local clientele on education, diagnosis of plant problems. Presented throughout the state for other Horticulture programs.

Graduate Teaching Assistant, Texas Tech University. (January 2004 - January 2007).
Teaching Principles of Horticulture Lecture and Labs. Research involves educational focus with developing Learning Outcomes for the Horticulture undergraduate major. Developed Assessment Program for Plant & Soil Science, Texas Tech University

Managed irrigation of Cabernet vineyard in experimental trials. Performed presentations for grape farmers and winemakers over conservation of water, and results of research. Collected physiology data, striped and pressed grapes, and performed basic juice analysis. Analyzed xylem sap for abscisic acid using ELISA technique.

TEACHING
Courses Taught

Texas Tech University

PSS 1411, Principles of Horticulture, 62 courses.
PSS 3311, Sustainable Vegetable Crop Production, 2 courses.
PSS 4001, Problems, 1 course.

RESEARCH

Published Intellectual Contributions

Journal Article, Academic Journal


Education and Post Graduate Training

Ph D, University of California, Berkeley, 1971.
   Major: Agricultural Economics

MS, University of California, Berkeley, 1968.
   Major: Agricultural Economics

BS, Texas Tech University, 1967.
   Major: Agricultural Economics

Academic and Professional Experience

Managing Director, Texas Tech University, International Textile Center. (1993 - Present).
   Head of unit focusing on research, technology transfer and development to benefit natural
   fibers, seeds, and polymers.

TEACHING

Courses Taught

Texas Tech University
   AAEC 5312, Agribusiness Analysis, 4 courses.
   PSS 5378, Economics of Cotton as an Industrial Raw Material, 1 course.

RESEARCH

Published Intellectual Contributions

Book, Chapter in Scholarly Book-New

   Center for Trade and Development (Ed.), Rapid Machine Testing of Cotton Fibers, Nepes and
   Short Fibers, and Textile Processing (vol. xxvii, pp. Chapter 2). ITC.

   Woodhead Publishing Limited.

Journal Article, Academic Journal


**Contracts, Grants and Sponsored Research**

**Grant**


**Service/Performance Partnerships**

Texas International Cotton School, Service Learning, During the TTU intersession in the month of August, an intensive two-week school for middle managers in the various segments of the global cotton industry are educated on all aspects of the cotton/textile complex. It is done in collaboration with the Texas cotton merchants and involves over 30 national experts from diverse cotton segments as instructors. An integral part of the instruction is multiple field trips to observe the structures and activities of the different parts of the cotton industry.
Edward Hellman  
Texas Tech University  
ed.hellman@ttu.edu

**Education and Post Graduate Training**

Ph D, University of Arkansas, 1982.  
Major: Plant Science

MS, University of Illinois, 1980.  
Major: Horticulture

BS, University of Illinois, 1977.  
Major: Horticulture

**Academic and Professional Experience**

Professor of Viticulture, Texas Tech University. (2007 - Present).

Associate Professor of Viticulture, Texas Tech University. (2000 - 2007).

**Leadership Awards and Honors**

T.V. Munson Award for exemplary contributions to Texas grape growing, Texas Wine & Grape Growers Association. (2015).

Co-author of Best Student Poster Presentation in Viticulture with Daniel Pate, Annual Conference of the American Society for Enology and Viticulture. (2011).


**TEACHING**

**Courses Taught**

**Texas Tech University**

IS 5332, Advanced Topics in Interdisciplinary Studies: Vinyard Problem Diagnosis, 1 course.

PSS 1311, The Science of Wine, 3 courses.

PSS 4000, Internship, 5 courses.

PSS 4001, Problems, 5 courses.

PSS 4310, Viticulture II: Grape Production, 11 courses.

PSS 5000, Professional Internship, 1 course.

PSS 5001, Problems in PSS: Vineyard Field Practices, 5 courses.

PSS 5312, Vineyard Management, 8 courses.

PSS 6000, Master's Thesis, 4 courses.

PSS 6001, Selected Topics in Plant and Soil Science, 4 courses.

PSS 7000, Research, 17 courses.

PSS 8000, Doctor's Dissertation, 9 courses.
Directed Student Learning


Yanmei Zhang, Master's Thesis Committee Member. (2012).

Daniel Pate, Master's Thesis Committee Member. (2011).

Michael Krawitzky, Master's Thesis Committee Chair. (2009).

Elvis Takow, Master's Thesis Committee Member. (2008).

RESEARCH

Published Intellectual Contributions

Abstract


Conference Proceeding


Journal Article, Academic Journal


Journal Article, Professional Journal


Journal Article, Public or Trade Journal


Technical Report


Presentations Given


Research Interests

true, Crop Science - Enology or Viticulture

Service/Performance Partnerships

Texas Wine & Grape Growers educational programs for Grape Camp and Annual Conference, Engaged Instruction: Non-Credit, The Texas Wine & Grape Growers Association (TWGGA) is the trade organization representing grape producers and wineries in Texas. TWGGA sponsors two major educational meetings each year - Grape Camp and TWGGA Annual Conference. Ed Hellman was 100% responsible for the two-day educational program for Grape Camp held November 7-8 in Fredericksburg, TX. Attendance at Grape Camp was approximately 150 each day. Hellman was also a major contributor to program development and delivery of the 2011 TWGGA Annual Conference, held March 3-5 in San Marcos, TX. Attendance averaged 130 for each of 3 days.

GENERAL

Professional Memberships

American Pomological Society.

American Society for Enology and Viticulture.

American Society for Horticultural Science.
Gerald Henry  
Texas Tech University  
gerald.henry@ttu.edu

Education and Post Graduate Training

Ph D, North Carolina State University, 2007.  
Major: Crop Science  
Supporting Areas of Emphasis: Turfgrass Weed Science/Ecology

MS, Rutgers University, 2003.  
Major: Plant Biology  
Supporting Areas of Emphasis: Turfgrass Weed Science

BS, Rutgers University, 2000.  
Major: Plant Science  
Supporting Areas of Emphasis: Turfgrass Management

Academic and Professional Experience

Assistant Professor, Texas Tech University. (2007 - Present).  
Turfgrass Science, Research/Teaching

TEACHING

Courses Taught

Texas Tech University  
PSS 1100, Freshman and Transfer Student Seminar, 1 course.  
PSS 3309, Introduction to Turfgrass Science, 5 courses.  
PSS 4000, Internship, 5 courses.  
PSS 4001, Problems, 4 courses.  
PSS 4316, Turfgrass Physiology and Ecology, 2 courses.  
PSS 4317, Golf Course Construction, 1 course.  
PSS 4318, Turf Pest Management, 1 course.  
PSS 5000, Professional Internship, 4 courses.  
PSS 5001, Problems in Plant and Soil Science, 4 courses.  
PSS 5315, Aspects of Golf Course Construction, 1 course.  
PSS 5318, Advanced Turfgrass Science, 1 course.  
PSS 6000, Master's Thesis, 7 courses.  
PSS 6001, Selected Topics in Plant and Soil Science, 4 courses.  
PSS 7000, Research, 9 courses.  
PSS 8000, Doctor's Dissertation, 7 courses.

RESEARCH

Published Intellectual Contributions

Conference Proceeding

**Journal Article, Academic Journal**


**Contracts, Grants and Sponsored Research**

**Grant**


Kucera, J. (Co-Principal), Henry, G. (Co-Principal), "Microbial and Morphological Response of Tall Fescue to Medina Soil Conditioners and," Sponsored by Medina Agriculture Products Co., Inc, Private, $8,165.00. (December 31, 2010 - December 31, 2011).
Dr. Eric F. Hequet  
Texas Tech University  
(806) 834-0621  
eric.hequet@ttu.edu

Education and Post Graduate Training

Major: Engineering Sciences (Textile Technology)

Ph D, Université de Haute Alsace, 2003.  
Major: Engineering Sciences (Textile Technology)

Major: Plants Genetics

MS, Universite Paris XI Orsay, 1980.  
Major: Genetics

Major: Chemistry-Physiology

Academic and Professional Experience

Department Chair, TTU, Plant and Soil Science. (September 2014 - Present).

Professor, TTU, Plant and Soil Science. (September 1, 2011 - Present).

Graduate Program Leader, TTU, Plant and Soil Science. (May 2010 - Present).

Associate Director, TTU, International Cotton Research Center. (September 2009 - Present).

Member Graduate Faculty, Haute-Alsace University, France. (December 2004 - Present).

Member Graduate Faculty, Texas A&M University. (December 2003 - Present).

Associate Director, Fiber and Biopolymer Research Institute, TTU. (September 2003 - Present).  
Joint appointment Texas Tech University (75%) – Texas AgriLife Research (25%)

Member Graduate Faculty, Texas Tech University. (September 1999 - Present).

Associate Professor, Plant and Soil Sciences, TTU. (September 2008 - August 2011).

Research Associate Professor, Plant and Soil Sciences, TTU. (September 2006 - August 2008).

TEACHING

Courses Taught
Texas Tech University

PSS 4001, Problems, 4 courses.
PSS 5000, Professional Internship, 2 courses.
PSS 5001, Problems in Plant and Soil Science: Literature Review, 9 courses.
PSS 5100, Seminar, 10 courses.
PSS 5376, Advanced Studies in Cotton Fiber, 12 courses.
PSS 6000, Master's Thesis, 13 courses.
PSS 6001, Selected Topics in PSS: Analytical Methods as a Tool for Crop Breeding and Heritability Evaluation, 8 courses.
PSS 7000, Research, 23 courses.
PSS 8000, Doctor's Dissertation, 12 courses.

Directed Student Learning

Addissu Ayele, Doctoral Advisory Committee Chair, Plant & Soil Science.

Brendan Kelly, Doctoral Advisory Committee Chair, Plant & Soil Science.

Roji Manandhar, Doctoral Advisory Committee Chair, Plant & Soil Science.

Chris Turner, Doctoral Advisory Committee Co-Chair, Electrical & Computer Engineering.

Deepika Mishra, Doctoral Advisory Committee Co-Chair, Plant & Soil Science.

Dylan Wann, Doctoral Advisory Committee Co-Chair, Plant & Soil Science.

Bablu Sharma, Doctoral Advisory Committee Member, Plant & Soil Science.

Bralie Hendon, Doctoral Advisory Committee Member, Plant & Soil Science.

Rajeev Rajbhandari, Doctoral Advisory Committee Member, Plant & Soil Science.

Charles Langdon, Master's Thesis Committee Chair, Plant & Soil Science.

Henry Hunter, Master's Thesis Committee Chair, Plant & Soil Science.

Ruvini Mathangadeera, Master's Thesis Committee Chair, Plant & Soil Science.

Scott Baker, Master's Thesis Committee Chair, Plant & Soil Science.

Herath Mudiyanselage Maheshika, Master's Thesis Committee Member, Plant & Soil Science.

Sumedha Liyanage, Master's Thesis Committee Member, Plant & Soil Science.

Kolblyn Joy, Dissertation Committee Co-Chair. (January 2014 - Present).

Nicholas Gallington, Master's Thesis Committee Chair. (January 2014 - Present).

Eng Hwa, Doctoral Advisory Committee Member, "Genetics of Cotton Fibers Elongation," Plant & Soil Science. (May 2013).

Eng Hwa, Doctoral Advisory Committee Member, "Genetics of Cotton Fiber Elongation." (May 2013).
Fulvio Simao, Doctoral Advisory Committee Member, "The Effects on Varying Levels of Deficit Irrigation and Episodic Drought Stress on West Texas Cotton Cultivars.," Plant & Soil Science. (May 2013).

Fulvio Simao, Doctoral Advisory Committee Member, "The effects of Varying Levels of Deficit Irrigation and Episodic Drought Stress on West Texas Cotton Cultivars." (May 2013).

Zhuanzhuan Ma, Master's Thesis Committee Chair, "Investigating the impact of drought stress on cotton fiber properties.," Plant & Soil Science. (May 2013).

Shanshan Li, Master's Thesis Committee Member, "Preparations and Characterizations of Cellulose-based Aerogels.," Plant & Soil Science. (May 2013).


Holli Elaine Myers, Other, Plant & Soil Science. (December 2012).


Benjamin Michael Beyer, Doctoral Advisory Committee Member, "Genetic Improvement of Upper Half Mean length and Short Fiber Content in Upland Cotton Gossypium hirsutum.," Plant & Soil Science. (August 2012).


James Hodgson, Other. (August 2012).

Neha khotari, Doctoral Advisory Committee Member, "Improvement of Cotton Fiber Maturity and Assessment of Intra-Plant Fiber Variability," Plant & Soil Science. (May 2012).

Kendra Gregory, Master's Thesis Committee Co-Chair, "Degree of Whiteness and Maturity among World Cotton Cultivars.," Plant & Soil Science. (May 2012).

Heath Reeves, Master's Thesis Committee Member, "Effects of Irrigation Termination Date on Cotton Yeild and Fiber Quality.," Plant & Soil Science. (May 2012).

Luis Cabrales, Doctoral Advisory Committee Member, "Analytical and Spectosscopic Approaches to Study Cellulose Macromolecules in Debelpoing Cotton Fibers.," Plant & Soil Science. (December 2011).

Payam Aminayi, Master's Thesis Committee Member, "Imparting super hydro/oleophobic properties to cotton fabric by means of molecular and nanoparticles vapor deposition methods.," Plant & Soil Science. (August 2011).


Margaret Shields, Doctoral Advisory Committee Member, "The evaluation and inheritance of several traits associated with lint percent in cotton.," Plant & Soil Science. (December 2010).

Matthew Hill, Master's Thesis Committee Co-Chair, "Vision System for Simultaneous Measurements of Dimensional Changes and Soil Release in Printed Fabric.." (May 2010).

Jason Sneed, Master's Thesis Committee Member, "Irrigation Termination to Improve Fiber Maturity on the Texas High Plains," Plant & Soil Science. (May 2010).

Carol Mason, Doctoral Advisory Committee Chair, "Improving Cotton (Gossypium hirsutum L.) for Fiber and Yarn Quality.." (December 2009).


Raina King, Master's Thesis Committee Member, "Structural analysis and basic inheritance characterization of the caducous bract trait of Gossypium," Plant & Soil Science. (May 2009).

Arunkumar Gururajan, Doctoral Advisory Committee Co-Chair, "Generalized schemes for automatic and interactive texture segmentation.," Electrical & Computer Engineering. (December 2008).

Houda Benzina, Doctoral Advisory Committee Member, "Microstructure of cotton.." (December 2008).

Lu Feng, Master's Thesis Committee Member, "Variability of fiber quality within a plant.," Plant & Soil Science. (December 2008).

Brock Faulkner, Doctoral Advisory Committee Member, "Comparison of Picker and stripper harvesters on irrigated cotton on the High Plains of Texas." (May 2008).

Muneem Shariar, Master's Thesis Committee Co-Chair, "Machine vision system for the quantification of cotton fiber length and maturity," Electrical & Computer Engineering. (May 2008).

Shahram Nowrouzich, Doctoral Advisory Committee Member, "Etude des phenomenes de cohesion et de friction inter fibres: cas du coton.." (December 2007).

Neha Kothari, Master's Thesis Committee Member, "Approach to Study Cotton Fiber Development.." (December 2007).

Narjes Rjiba, Dissertation Committee Member, "Fibre de coton: microstructure et proprietes de surface." (June 2007).

Sridharan Kamalakannan, Master's Thesis Committee Member, "Energy-based Deformable Contours in Computer Vision; Recent Advances and Customization for Two Applications.." (June 2007).
Maulding Gene, Master's Thesis Committee Chair, "Yield components of new germplasm." (March 2007).

Wan Huapeng, Master's Thesis Committee Member, "Fiber property characterization by image processing." (March 2007).

Amara Asma, Dissertation Committee Member, "Contribution a l'etude de l'adhesion des miellats du coton." (December 2006).

Mao Cui, Master's Thesis Committee Chair, "Unsupervised segmentation of twotexture images using Gabor filters with optimized coefficients." (October 2006).

Carol Kelly, Master's Thesis Committee Member, "Evaluation of yield and fiber trait responses across irrigation treatments." (June 2006).

Chaitanya Raju, Master's Thesis Committee Chair, "Segmentatin of radiographs of cervical spine using level sets." (May 2006).

Mark Kelley, Dissertation Committee Member, "Field weathering effects on stripper harvested cotton in the Texas High Plains." (March 2006).

Christopher Braden, Doctoral Advisory Committee Chair, "Inheritance of cotton fiber length and distribution." (June 2005).

Sarangoo Ukhnaa, Doctoral Advisory Committee Chair, "Etude des properietes physiques et mecaniques de la fibre de cachemire, limite de filabilite." (January 2005).


Leigh Crammer, Master's Thesis Committee Member, "A better understanding of the number of fibers per seed in cotton." (June 2004).

RESEARCH

Published Intellectual Contributions

Book, Chapter in Scholarly Book-New


Conference Proceeding


**Journal Article, Academic Journal**


Journal Article, Professional Journal


Presentations Given


Contracts, Grants and Sponsored Research

Grant


Sari-Sarraf, H. (Co-Principal), Hequet, E. (Co-Principal), "Marketing Research for the Commercial Development of a Machine Vision System for Simultaneous Measurement of Stain Release
and Shrinkage in Fabrics," Sponsored by TTU Office of Technology Commercialization, Texas Tech University, $13,733.00. (March 2011 - August 2011).


GENERAL

Professional Memberships

Board member, Texas State Seed and Plant Board. (2014 - Present).


Association for the Advancement of Industrial Crops. (January 1, 2011 - Present).

American Association for the Advancement of Science. (January 1, 2010 - Present).

Society of Photo-Optical Instrumentation Engineers. (January 1, 2007 - Present).

Fiber Society. (January 1, 2005 - Present).

American Association of Textile Chemists and Colorists. (January 1, 2000 - Present).


Wayne Hudnall  
Texas Tech University  
wayne.hudnall@ttu.edu  

Education and Post Graduate Training  

Ph D, University of Hawaii.  
Major: Soil Mineralogy, Soil Chemistry, Soil Genesis and Classification  
Dissertation Title: Genesis and Morphology of Secondary Products in Selected Volcanic Ash Soils from the Island of Hawaii  

MS, Texas Tech University, 1971.  
Major: Soil Science  
Dissertation Title: Relationships Between Soil Properties and Mesquite (Prosopis glandulosa Torr.) Density on Selected Calcareous Soils of West Texas.  

BS, Texas Tech University, 1969.  
Major: Soil Science  

Academic and Professional Experience  

B. L. Allen Endowed Professor of Pedology, Texas Tech University. (2004 - Present).  
Professor, Louisiana State University. (1993 - 2004).  

TEACHING  

Courses Taught  

Texas Tech University  
PSS 4000, Internship, 7 courses.  
PSS 4001, Problems: Environmental Soil Chemistry, 8 courses.  
PSS 5000, Professional Internship, 5 courses.  
PSS 5001, Problems in Plant and Soil Science, 4 courses.  
PSS 5334, Soils and Crops in Arid Lands, 3 courses.  
PSS 5336, Soil Mineralogy, 2 courses.  
PSS 5337, Advanced Soil Classification, 2 courses.  
PSS 6000, Master's Thesis, 8 courses.  
PSS 6001, Problems: Advanced Environmental Soil Chemistry, 5 courses.  
PSS 7000, Research, 8 courses.  
PSS 8000, Doctor's Dissertation, 5 courses.  

RESEARCH  

Published Intellectual Contributions  

Abstract  


Journal Article, Academic Journal


Presentations Given


Contracts, Grants and Sponsored Research

Grant

- Kucera, J. (Principal), Horita, J. (Co-Principal), Hudnall, W. (Co-Principal), Zak, J. (Co-Principal), "Soil Microbial Communities: Key Indicators of Soil Carbon Transformations When Conservation Reserve Program Land is Converted to Cropland," Sponsored by USDA-AFRI, Federal, $480,000.00.


Intellectual Contributions in Submission

Journal Article, Academic Journal


**Service/Performance Partnerships**

Soil Survey of Texas Counties, Technical or Expert Assistance, Soil Survey( soils map) of the counties in Texas. It include lab data generation in support of the soil survey.
Brendan Kelly
Texas Tech University
brendan.kelly@ttu.edu

Academic and Professional Experience

Research Assistant Professor, Texas Tech University. (2015 - Present).

TEACHING

Courses Taught

Texas Tech University
 PSS 5370, U.S. and Global Cotton Fiber-Textile Industries, 1 course.
 PSS 7000, Research, 1 course.
Dr. Jennifer M. Kucera  
Texas Tech University  
(806) 834-5485  
jennifer.moore-kucera@ttu.edu

Education and Post Graduate Training

Ph D, Oregon State University, 2005.  
Major: Soil Science  
Supporting Areas of Emphasis: Focus: Soil Microbiology and Biochemistry  
Dissertation Title: “Microbial Community Structure as Influenced by Season and Stand Age in a Douglas-fir (Pseudotsuga menziesii) Ecosystem.”  

MS, Iowa State University, 1998.  
Major: Soil Science  
Supporting Areas of Emphasis: Soil Microbiology and Biochemistry  
Dissertation Title: "Microbial biomass carbon and nitrogen, dehydrogenase activity, and fixed ammonium as affected by cropping systems."

BA, Binghamton University (State University of New York),, 1994.  
Major: Biology and Environmental Studies

Academic and Professional Experience

Associate Professor, Texas Tech University. (2014 - Present).

Assistant Professor, Texas Tech University. (2008 - 2014).  
Research focus: Soil microbial ecology/ C across the landscape  
System: Managed and natural landscapes

Research focus: Soil microbial ecology and nutrient management  
System: Sweet cherry orchards

Research focus: Trace Gas Fluxes/Soil Microbial Ecology  
System: Semi-arid grasslands

Oregon State University, Graduate Research Assistant. (2002 - 2005).  
Research focus: Forest soil microbial ecology  
System: Old-growth and clear-cut Douglas-fir stands

Leadership Awards and Honors

CASNR Junior Faculty Award, College of Agricultural Sciences & Natural Resources. (August 2012).

TEACHING
Courses Taught

Texas Tech University
- IS 1100, Tech Transition: Freshman Seminar, 1 course.
- PSS 2330, Urban Soils, 4 courses.
- PSS 4000, Internship, 11 courses.
- PSS 4001, Problems, 10 courses.
- PSS 4331, Soil Microbiology Ecology, 3 courses.
- PSS 4337, Environmental Soil Science, 6 courses.
- PSS 5001, Problems in Plant and Soil Science, 4 courses.
- PSS 6000, Master's Thesis, 9 courses.
- PSS 6001, Selected Topics in PSS: Teaching Practicum for Soil Ecology, 5 courses.
- PSS 6331, Advanced Environmental Soil Science, 7 courses.
- PSS 6432, Advanced Soil Microbial Ecology, 6 courses.
- PSS 7000, Research, 18 courses.
- PSS 8000, Doctor’s Dissertation, 15 courses.

Directed Student Learning

Chenhui Li, Master's Thesis Committee Chair, "In Situ Degradation of Potentially Biodegradable Mulch under ATomato Production and Impacts on Soil Quality." (2013).

Andre Bugge, Master's Thesis Committee Co-Chair, "Shifts in Plant Community Composition across a Conservation Reserve Program Chronosequence and Associated Soil Chemical Properties of Amarillo Loamy Sand in the Texas High Plains. Arid Land Studies (in collaboration with the Department of Natural Resources Management, Texas Tech University, Department of Geography, University of Sheffield, UK, and Department of Agriculture and Horticulture, Humboldt University, Berlin Germany)." (2013).

Josefine Dathe, Master's Thesis Committee Co-Chair, "Burn Severity and Tree Species Impacts on Soil Chemical and Biological Properties from Fire-Prone Sites in the Davis Mountains, Tx. Arid Land Studies (in collaboration with the Department of Natural Resource Management, Texas Tech University, Department of Geography University of Sheffield, UK and Department of Agriculture and Horticulture Humboldt University, Berlin Germany)." (2013).


Lisa Fultz, Doctoral Advisory Committee Chair. (2012).

Marko Davinic, Doctoral Advisory Committee Chair, "Soil Microbial Community Diversity and Functionality as affected by integrated cropping livestock systems in the Southern High Plains." (2012).


Teaching Awards and Honors

Innovative Teaching Award, TTU IS1100. (2010).

RESEARCH
Published Intellectual Contributions

Book, Chapter in Scholarly Book-New


Journal Article, Academic Journal


**Presentations Given**


Kakarla, M. (Presenter & Author), Kucera, J., Fultz, L. (Author Only), Li, C. (Author Only), Zak, J., Acosta-Martinez, V., Ecological Society of America Annual Meeting, "Microbial community response to increased years of grassland restoration under the Conservation Reserve Program in semiarid sandy soils." (August 2014).


Kucera, J. (Presenter & Author), Acosta-Martinez, V. (Author Only), Zak, J. (Author Only), Horita, J. (Author Only), USDA-AFRI- Annual Meeting, "Soil Microbial Communities: key Indicators of Soil Carbon Transformation When Conservation Resereve Program Land is Converted to Cropland," USDA, Washington, DC. (June 2013).


**Contracts, Grants and Sponsored Research**

**Grant**
Kucera, J. (Principal), Horita, J. (Co-Principal), Hudnall, W. (Co-Principal), Zak, J. (Co-Principal), "Soil Microbial Communities: Key Indicators of Soil Carbon Transformations When Conservation Reserve Program Land is Converted to Cropland," Sponsored by USDA-AFRI, Federal, $480,000.00.


Kucera, J. (Co-Principal), "Research and Education on Biodegradable Mulches for Specialty Crops Produced under," Sponsored by USDA/Washington State University, Federal, $97,701.00. (October 1, 2009 - September 30, 2012).


Kucera, J. (Co-Principal), Henry, G. (Co-Principal), "Microbial and Morphological Response of Tall Fescue to Medina Soil Conditioners and," Sponsored by Medina Agriculture Products Co., Inc, Private, $8,165.00. (December 31, 2010 - December 31, 2011).


**Intellectual Contributions in Submission**

**Journal Article, Academic Journal**


**SERVICE**

**College Service**

Committee Member, Vice President for Research Undergraduate Research Task. (August 2011 - December 2011).
Public Service

Guest Speaker, Roscoe-Wilson Elementary School, Lubbock, TX. (October 29, 2012).

GENERAL

Licensures and Certifications


Professional Memberships

American Society for Horticulture Science.

Soil Science Society of America.
Katie Lewis
Texas Tech University
katie.lewis@ttu.edu

TEACHING

Courses Taught

Texas Tech University
PSS 4335, Soil Fertility and Nutrient Management, 2 courses.
PSS 5331, Advanced Plant Nutrient Management, 2 courses.
Scott Longing  
Texas Tech University  
scott.longing@ttu.edu

Education and Post Graduate Training

Ph D, Virginia Piletechnic Institute and State University, 2006.

MS, University of Arkansas, 2002.  
Major: Entomology

BS, Arkansas Tech University, 1996.  
Major: Biology

Academic and Professional Experience

Assistant Professor, Texas Tech University. (2014 - Present).

Visiting Assistant Professor, Texas Tech University. (2012 - 2014).

Postdoctoral Fellow, University of Arkansas. (2011 - 2012).

Research Associate, Univeristy of Arkansas. (2009 - 2010).

Lecturer, Freshwater Biomonitoring. (2007).

Teacing Assistant, Virginia Tech University. (2006).  
Insects and Human Society

Lab Instructor, Virginia Tech University. (2002 - 2006).

Teaching Assistant, Virginia Tech University. (2005).

TEACHING

Courses Taught

Texas Tech University
- PSS 2401, Introductory Entomology, 38 courses.
- PSS 4000, Internship, 1 course.
- PSS 4001, Problems, 5 courses.
- PSS 4301, Agricultural Compounds, 2 courses.
- PSS 4305, Integrated Pest Management, 1 course.
- PSS 5001, Problems in Plant and Soil Science, 1 course.
- PSS 5307, Pesticides, 3 courses.
- PSS 6000, Master’s Thesis, 1 course.
- PSS 7000, Research, 6 courses.
- PSS 8000, Doctor’s Dissertation, 1 course.

Directed Student Learning
Amede Rubio, Doctoral Advisory Committee Chair, "Restoration ecology of giant reed grass in the Rio Grande Valley.." (2015 - Present).

Alicia Patridge, Master's Thesis Committee Chair, "Bee diversity of urban gardens in Lubbock, TX." (2015 - Present).

Britt Smith, Doctoral Advisory Committee Chair, ". Influence of prescribed fire on arthropods in mesquite dominant rangelands of north-central Texas.." (2014 - Present).

Samuel Discua, Doctoral Advisory Committee Chair, "Pollinator insect communities on the U.S. Southern High Plains: Diversity and patterns associated with land use and land cover." (2014 - Present).

Jacob Price, Doctoral Advisory Committee Co-Chair, "Epidemiology of wheat streak mosaic virus and Triticum mosaic virus in relation to vector spread from volunteer wheat and native CRP grasslands." (2014 - Present).

Jessica East, Master's Thesis Committee Member, "Changes in food web structure along multi-scale environmental gradients in the Pecos River, USA." (2013).


**RESEARCH**

**Published Intellectual Contributions**

**Journal Article, Academic Journal**


**Journal Article, Professional Journal**


**Contracts, Grants and Sponsored Research**

**Grant**


**SERVICE**

**Public Service**

Guest Speaker, Lubbock Memorial Arboretum, Lubbock, TX. (August 11, 2014).
Stephen Maas  
Texas Tech University  
stephen.maas@ttu.edu

**Education and Post Graduate Training**

Ph D, Texas A&M University, 1985.  
Major: Agronomy

MS, Texas A&M University, 1975.  
Major: Meteorology

BS, Texas A&M University, 1973.  
Major: Meteorology


**Academic and Professional Experience**

Professor of Agricultural Microclimatology, Texas Tech University. (2000 - Present).

**TEACHING**

**Courses Taught**

**Texas Tech University**

- PSS 4001, Problems, 4 courses.
- PSS 4100, Seminar, 1 course.
- PSS 5001, Problems in Plant and Soil Science, 4 courses.
- PSS 5323, Environmental Crop Physiology, 7 courses.
- PSS 5329, Precision Agricultural, 2 courses.
- PSS 5351, Environmental Instrumentation and Measurements, 10 courses.
- PSS 6000, Master's Thesis, 8 courses.
- PSS 6001, Selected Topics in Plant and Soil Science, 4 courses.
- PSS 6301, Quantitative Agricultural Remote Sensing, 8 courses.
- PSS 6302, Plant Growth Modeling, 2 courses.
- PSS 7000, Research, 22 courses.
- PSS 8000, Doctor's Dissertation, 14 courses.

**RESEARCH**

**Published Intellectual Contributions**

**Abstract**


**Conference Proceeding**


**Journal Article, Academic Journal**


**Journal Article, Professional Journal**


**Contracts, Grants and Sponsored Research**

**Grant**


**Intellectual Contributions in Submission**

**Journal Article, Academic Journal**

Cui, S., Youn, E., Lee, J., Maas, S. An improved systematic approach to predicting transcription factor target genes using support vector machine. *PLOS ONE.*
Dr. Cynthia B. McKenney
Texas Tech University
(806) 742-2838
cynthia.mckenney@ttu.edu

Education and Post Graduate Training

EDD, Texas Tech University, 2000.
   Major: Higher Education: Administration

MS, Texas Tech University, 1986.
   Major: Horticulture

BS, Texas Tech University, 1979.
   Major: Ornamental Horticulture

Academic and Professional Experience

Rockwell Endowed Professor of Horticulture and Associate Chair, Texas Tech University. (November 2013 - Present).

Professor and Associate Chair, Texas Tech University. (2011 - Present).

Professor of Horticulture and Distance Education Leader, Texas Tech University. (2010 - 2011).

Associate Professor of Horticulture and Distance Education Leader, Texas Tech University. (2006 - 2010).

Associate Professor of Horticulture, Texas Tech University / Texas A&M University. (2004 - 2006).
   Distance Education Coordinator, Urban Horticulture Project Leader and Extension Specialist

Assistant Professor of Horticulture, Texas Tech Univ. / Texas A&M. (1999 - 2004).
   Distance Ed. Coord., Urban Horticulture Project Leader & Extension Specialist

Leadership Awards and Honors


Service and Outreach Award, College of Agricultural Sciences and Natural, Texas Tech University. (2014).

Rockwell Endowed Professor of Horticulture, Texas Tech University. (2013).


TEACHING

Courses Taught
Texas Tech University

AAEC 7200, Teaching Practicum, 2 courses.
PSS 2313, Herbaceous Plant Materials, 7 courses.
PSS 3317, Interior Plants, 15 courses.
PSS 4000, Internship, 14 courses.
PSS 4001, Problems: Intro to Permaculture, 44 courses.
PSS 4313, Arboriculture, 3 courses.
PSS 4314, Garden Center Management, 8 courses.
PSS 4411, Greenhouse Crop Production, 12 courses.
PSS 5000, Professional Internship, 8 courses.
PSS 5001, Problems in Plant and Soil Science, 56 courses.
PSS 5316, Advanced Arboriculture, 7 courses.
PSS 5317, Advanced Nursery Management, 11 courses.
PSS 5319, Advanced Interiorscaping, 13 courses.
PSS 5321, Plant Breeding Theory, 1 course.
PSS 5415, Advanced Greenhouse Crop Production, 12 courses.
PSS 6000, Master's Thesis, 14 courses.
PSS 6001, Selected Topics in Plant and Soil Science: Plant Material Identification, 7 courses.
PSS 7000, Research, 18 courses.
PSS 8000, Doctor's Dissertation, 9 courses.

Directed Student Learning

Summer Loneragan, Dissertation Committee Chair, Plant & Soil Science. (September 2012 - Present).

Andrea Krieg, Doctoral Advisory Committee Member, "Food safety treatments for producing ready to eat salads." (December 2015).

Michael Canya, Doctoral Advisory Committee Member, "Water harvesting techniques to address drought in Kenya." (December 2015).

Teresia Mbogori, Doctoral Advisory Committee Member, "Combating food insecurity with the One Health initiative." (December 2015).

Daria Mckelvery, Master's Thesis Committee Chair, "Overcoming complex dormancy issues in four native forbes. Department of Plant and Soil Science." (December 2015).

Benjamin Dean, Master's Thesis Committee Chair. (2015).


Heidi Clark, Master's Thesis Committee Chair. (2015).


Miguel Hinojosa, Doctoral Advisory Committee Member. (2014).

Sha Li, Doctoral Advisory Committee Member, "The impact of Facebook interactive features use on individual's social capital: a moderated mediation model." (2014).

Cole Watts, Master's Thesis Committee Chair. (2014).
John Kerlin, Master's Thesis Committee Member. (2014).

Staci Parks, Master's Thesis Committee Member, "Physiological response of Olea europea to irrigation quality and quantity." (2014).

Dana Bell, Doctoral Advisory Committee Member. (2013).

Jessica Poole, Master's Thesis Committee Chair, "Salinity effects on four Texas native plants in hydroponics system." (2013).

Rebecca Grubbs, Master's Thesis Committee Chair, "Understanding the salinity tolerance of three High Plains bedding plant species in hydroponics setting." (2013).

Christy Morgan, Master's Thesis Committee Member. (2013).

Jacob Gosschalk, Master's Thesis Committee Member. (2013).

Jennifer Williams, Master's Thesis Committee Member. (2013).

Lauren Lothrop, Master's Thesis Committee Member. (2013).

Lenore Klag-Young, Master's Thesis Committee Member. (2013).

Rickey Greenfield, Master's Thesis Committee Member. (2013).

Victoria Baumer, Master's Thesis Committee Member. (2013).

Cynthia Trembley, Master's Thesis Committee Chair. (2012).


Allison Watkins, Master's Thesis Committee Member. (2012).

Isabel Brown, Master's Thesis Committee Member. (2012).

Jheri Smith, Master's Thesis Committee Member. (2012).

Lora Russo, Master's Thesis Committee Member. (2012).

Munzio Tazwell, Master's Thesis Committee Member. (2012).

Amber Bates, Dissertation Committee Chair, Plant & Soil Science. (May 2012).


Adam Purnell, Master's Thesis Committee Chair, "Determination of drought tolerance and parentage of live oak (Quercus virginiana) and escrment live oake (Quercus fusiformis) accessions for adaptation to demaning enviroments." (2010).

Leah Crosby, Master's Thesis Committee Chair, "Most conducive Cumber Cultivar for Space Implementation." (2008).
Ashley Basinger, Dissertation Committee Co-Chair, "Competency-based curriculum for the horticulture major: A national Delphi-study.," Plant & Soil Science. (May 2007).

Cynthia Lowery, Dissertation Committee Co-Chair, "Detection of Ricin and RCA in Immuno Assays," Plant & Soil Science. (December 2005).

Teaching Awards and Honors


Teacher of the Semester, College of Agricultural Sciences and Natural Resources. (2007).

RESEARCH

Published Intellectual Contributions

Book, Chapter in Scholarly Book-Revised


Book, Scholarly-New


Conference Proceeding


Journal Article, Academic Journal


**Journal Article, Professional Journal**


Media Contributions

Internet

Texas Olive Oil Council Virtual Conference. (August 2013).
Herbaceous Plant Database. (October 2012).
Herbaceous Plant Picture Pages Searchable Database. (2005).

Other


Radio


Contracts, Grants and Sponsored Research

Contract

Liu, H. (Principal), McKenney, C. (Supporting), Senadheera, S., "Technical Assistance To TxDOT Lubbock District," Sponsored by Texas Department of Transportation, State, $500,000.00. (September 1, 2011 - August 31, 2013).

Grant


Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $10,000.00. (October 10, 2014 - August 31, 2015).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $55,985.00. (December 5, 2014 - August 1, 2015).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $10,000.00. (October 10, 2014 - August 31, 2015).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $8,910.00. (November 12, 2014 - March 31, 2015).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $53,000.00. (April 2, 2014 - February 28, 2015).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $14,036.00. (July 25, 2014 - December 31, 2014).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $26,447.00. (April 2, 2014 - August 31, 2014).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $15,000.00. (July 2, 2014 - August 31, 2014).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $9,981.00. (May 2, 2014 - August 31, 2014).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $2,198.00. (July 15, 2014 - August 15, 2014).

Senadheera, S. (Co-Principal), Kvashny, A. (Co-Principal), McKenney, C. (Co-Principal), Liu, H. (Principal), Won, M.-C. (Co-Principal), "Technical Assistance to Texas Department of Transportation," Sponsored by TX Dept of Transportation, $6,000.00. (February 24, 2014 - May 1, 2014).

"Development and Promotion of QR Codes for Increasing Sales of Texas SuperStar Plants," Sponsored by USDA/TxDeptofAg/Tx Agrilife Research, $3,213.00. (October 1, 2012 - December 31, 2013).

**Sponsored Research**

Nash, P. (Supporting), Liu, H. (Principal), Senadheera, S. (Supporting), Zartman, R. (Supporting), McKenney, C. (Supporting), "Technical Assistance to the Lubbock District of TxDOT (Interagency Contract Agreement)," Sponsored by Texas Department of Transportation, State, $150,000.00. (September 1, 2010 - August 31, 2011).
Intellectual Contributions in Submission

Journal Article, Professional Journal


Research Interests

true, Crop Science - Arboriculture, Horticulture, Horticulture - Floriculture, Landscape Ecology, Plant Sciences, Salinity

SERVICE

Service/Performance Partnerships

Ag*Idea Degree and Certificate Programs in Horticulture, Engaged Instruction: Credit, The group of PI's have developed an consortium of univeristy programs that has allowed us to course share distance education courses with multiple institutions. This has allowed us to increase the depth of our offerings to our online students.

CEMAP Plant Selection Board, Engaged Research and Creative Activity, The CEMAP program is the Coordinated Educational Marketing Assistance Program which serves as a plant selection board for ornamental plants for the State of Texas. This group of individuals conducts plant trials at each of their locations to determine those plants that will be recommended across Texas.

Service Awards and Honors

Service, Professional

Honorary Lifetime Membership Award, Texas Nursery and Landscape Association. (August 2013).

GENERAL

Licensures and Certifications

Quality Matters Peer Reviewer, Quality Matters - Univ. of MA. (2006 - Present).


Consulting

Academic, Quality Matters, National, Online Presence through Univ of Maryland. (October 2008).
Professional Memberships

President, board member, grant writer, Lubbock Memorial Arboretum Foundation Board. (2006 - Present).


Past Chapter President, Pi Alpha Xi. (1986 - Present).

Executive Board Member, Education Vice President, American Society for Horticultural Sciences, Southern Region. (1984 - Present).

Past Chapter President, Phi Kappa Phi. (1979 - Present).


Development Activities Attended


Faculty Development Leave, University of Arizona, Tucson, AZ. (July 2011 - December 2011).


Workshop, "Professor's Workshop," Valley Crest Corp, Fresno, CA. (February 2008).

Conference Attendance, "Higher Education in Agriculture Conference," US Dept of Agriculture, College Station, TX. (June 2007).

Education and Post Graduate Training

Ph D, Texas Tech University, 1979.
Major: Range Ecology
Supporting Areas of Emphasis: Statistics
Dissertation Title: Edaphic Ecotypic Differentiation in Mesquite Along a Latitudinal Gradient

MS, Colorado State University, 1973.

BS, Texas Tech University, 1971.

Academic and Professional Experience

Research Professor, Texas Tech University. (2012 - Present).

Leadership Awards and Honors

Distinguished Alumnus, College of Agricultural Sciences and Natural Resources. (2010).

Outstanding Alumnus, Department of Natural Resources Management. (2009).

TEACHING

Courses Taught

Texas Tech University
NRM 3308, Quantitative Methods in Natural Resources, 1 course.
NRM 5303, Synecology, 1 course.
NRM 6000, Master’s Thesis, 8 courses.
NRM 6001, Selected Topics in Range Science: Plant Ecohydrology, 2 courses.
NRM 6330, Plant Ecohydrology, 1 course.
NRM 7000, Research, 12 courses.
PSS 5302, Statistical Applications in Natural Resources, 2 courses.
PSS 6001, Selected Topics in PSS: Ecological Modeling, 1 course.

RESEARCH

Published Intellectual Contributions

Journal Article, Academic Journal


Journal Article, Professional Journal


Research Report

**Presentations Given**

Rainwater, K., Song, L., Cleveland, T., Schroeder, J., Fish, E., McLendon, T., Zartman, R., Arsuffi, T., Asquith, W., Presentation to Speaker of the Texas House of Representatives Joe Straus and 84th District Representative John Frullo, "Selected Recent Texas Water Research Interests and Capabilities," Office of the President of Texas Tech University, Lubbock, TX. (September 29, 2014).


Venugopal Mendu  
Texas Tech University  
(806) 834-6327  
venugopal.mendu@ttu.edu

Education and Post Graduate Training

Major: Plant pathology  
Supporting Areas of Emphasis: Gene silencing and plant innate immunity

Postdoctoral, University of Kentucky, 2012.  
Major: Horticulture  
Supporting Areas of Emphasis: Cell wall biology

Postdoctoral, University of Kentucky, 2009.  
Major: Plant pathology  
Supporting Areas of Emphasis: Plant virus replication

Ph D, University of Kentucky, 2008.  
Major: Plant Physiology/Biochemistry/Molecular Biology Program  
Dissertation Title: "Role of microRNAs in plant abiotic stress, development and

MS, A.N.G.R. Agricultural University, India, 2000.  
Major: Genetics & Plant Breeding  
Dissertation Title: Heterosis and combining ability studies on grain yield and its

Major: Agriculture

Academic and Professional Experience

Assistant Professor, Department of Plant and Soil Science. (2013 - Present).  
Assistant Professor  
Department of Plant and Soil Science  
Texas Tech University, Lubbock, TX, USA

Postdoctoral Fellow, PI: Dr. Lionel Navarro, Institute of Biology. (2012 - 2013).  
Postdoctoral Fellow  
PI: Dr. Lionel Navarro, Institute of Biology  
Ecole Normale Superieure, Paris, France.

Postdoctoral Fellow, PI: Dr. Seth Debolt, Cellulose biosynthesis and biofuels lab. (2010 - 2012).  
Postdoctoral Fellow  
PI: Dr. Seth Debolt, Cellulose biosynthesis and biofuels lab  
Department of Horticulture, University of Kentucky, USA.

Postdoctoral Fellow, PI: Dr. Peter D. Nagy, Molecular virology lab. (2008 - 2009).  
Postdoctoral Fellow  
PI: Dr. Peter D. Nagy, Molecular virology lab  
Department of Plant Pathology, University of Kentucky, USA.
TEACHING

Courses Taught

Texas Tech University

- PSS 4001, Problems, 1 course.
- PSS 4100, Seminar, 2 courses.
- PSS 4426, Introduction to Genomics, 2 courses.
- PSS 5325, Transgenic and Plant Cell Genetics, 2 courses.
- PSS 5426, Functional Genomics, 4 courses.
- PSS 6000, Master’s Thesis, 3 courses.
- PSS 7000, Research, 6 courses.

Directed Student Learning

- Theophilus Tengey, Doctoral Advisory Committee Chair. (2014).
- Vimal Kumar, Doctoral Advisory Committee Chair. (2014).
- Amrita Dhal, Master’s Thesis Committee Chair. (2014).
- Cassie Welker, Master’s Thesis Committee Chair. (2014).

RESEARCH

Published Intellectual Contributions

Abstract


Book, Chapter in Scholarly Book-New


Journal Article, Academic Journal


Mendu, V. (2012). The TPR domain in the host Cyp40-like cyclophilin binds to the viral replication protein and inhibits the assembly of the tombusviral replicase. *PLOS Pathogens, 2*(8), e100249.


Mendu, V. (2010). Cpr1 cyclophilin and Ess1p parvulin prolyl isomerases interact with the tombusvirus replication protein and inhibit viral replication in yeast model host.. *Virology, 406*, 342-351.

**Contracts, Grants and Sponsored Research**

**Grant**

Cao, G. (Co-Principal), Ballou, M. (Principal), Barbato, L. (Co-Principal), Mulligan, K. (Co-Principal), Burow, M. (Co-Principal), Williams, R. (Co-Principal), Seshadri, S. (Co-Principal), Mendu, V. (Co-Principal), West, C. (Co-Principal), Trojan, S. (Co-Principal), Ritchie, G. (Co-Principal), Woodward, J. (Co-Principal), Sarturi, J. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies- TTU," Sponsored by United States Department of Agriculture, Federal, $340,222.00. (September 1, 2014 - August 31, 2016).

**SERVICE**

**Professional Service**


**GENERAL**

**Licensures and Certifications**

Lab safety, TTU-EHS. (July 20, 2013 - July 19, 2014).

**Professional Memberships**

Member, Gamma Sigma Delta, the Honor Society of Agriculture. (2014 - Present).

Member, International Cotton Researchers Association. (September 11, 2013 - Present).

Development Activities Attended

Proposal Development Program, "Faculty Proposal Development Program (FPDP)," TTU, Lubbock, Texas, USA. (October 4, 2013 - May 2, 2014).
Dr. Thayne Montague  
Texas Tech University  
(806) 742-2838  
thayne.montague@ttu.edu

Education and Post Graduate Training

Ph D, Utah State University, 1999.  
Major: Woody Plant Physiology

MS, Auburn University, 1993.  
Major: Ornamental Horticulture / Plant Physiology

BS, Brigham Young University, 1990.  
Major: Ornamental Horticulture

Academic and Professional Experience

Associate Professor, Texas AgriLife Research. (September 2006 - Present).

Associate Professor, Texas Tech University. (September 2005 - Present).

Assistant Professor, Texas Tech University. (February 1999 - September 2005).

Leadership Awards and Honors

President’s Excellence in Advising Award, College of Agricultural Sciences and Natural Resources. (2014).

President’s Excellence in Teaching Award Recipient, Texas Tech University. (2013).

Texas Tech University Graduate School Service Award., Texas Tech University Graduate School. (2008).

TEACHING

Courses Taught

Texas Tech University

IS 1100, RaiderReady: Freshman Seminar, 7 courses.
PSS 1411, Principles of Horticulture, 6 courses.
PSS 2312, Propagation Methods, 14 courses.
PSS 3310, Viticulture I: Principles of Viticulture, 8 courses.
PSS 3318, Woody Plants, 17 courses.
PSS 3323, Crop Physiology, 3 courses.
PSS 4000, Internship, 14 courses.
PSS 4001, Problems: Propagation Methods, 10 courses.
PSS 5000, Professional Internship, 10 courses.
PSS 5001, Problems in Plant and Soil Science: Principles of Viticulture, 14 courses.
PSS 6000, Master's Thesis, 8 courses.
PSS 6001, Selected Topics in Plant and Soil Science, 7 courses.
PSS 7000, Research, 5 courses.
PSS 8000, Doctor's Dissertation, 4 courses.

Directed Student Learning


Staci Parks, Master's Thesis Committee Chair, "Impact of drought on oil quality of Olea europaea." (2014).

Becky Grubs, Master's Thesis Committee Chair. (2013).

Christy Morgan, Master's Thesis Committee Chair. (2013).

Lenore Klag Young, Master's Thesis Committee Chair. (2013).


Anne Brown, Master's Thesis Committee Chair. (2012).

Jheri Lynn Smith, Master's Thesis Committee Chair. (2012).

Kaylee Decker, Master's Thesis Committee Chair. (2012).

Lora Russo, Master's Thesis Committee Chair. (2012).

Munzio Tazwell, Master's Thesis Committee Chair. (2012).

Vikram Baliga, Master's Thesis Committee Chair. (2012).

Samara Gray, Master's Thesis Committee Chair. (2010).

Michael Krawitzky, Master's Thesis Committee Chair. (2009).

RESEARCH

Published Intellectual Contributions

Abstract


Montague, D. (2009). *Physiology of field-grown cool, warm and hot climate grape varieties on the Texas High Plains.* (pp. 4-6). Granbury, Texas: Viticulture and Enology Research Symposium..


**Conference Proceeding**


**Journal Article, Academic Journal**


**Journal Article, Professional Journal**


**Presentations Given**


**Research Interests**

true, Horticulture, Horticulture - Pomology
Russell Plowman
Texas Tech University
russell.d.plowman@ttu.edu

Education and Post Graduate Training

MS, Texas Tech University, 1985.
BS, Texas Tech University, 1983.

Academic and Professional Experience

Instructor, Texas Tech University. (2013 - Present).

TEACHING

Courses Taught

Texas Tech University
   PSS 1411, Principles of Horticulture, 59 courses.
   PSS 2210, Floral Design, 6 courses.
Education and Post Graduate Training

Ph D, University of Georgia, 2007.
Major: Cotton Physiology
Dissertation Title: Cotton Irrigation Scheduling and Defoliation Estimates Using Remote Sensing.

MS, Utah State University, 2003.
Major: Crop Physiology
Dissertation Title: Use of Ground-Based Canopy Reflectance to Determine Radiation Capture, Nitrogen and Water Status, and Final Yield in Wheat

BS, Utah State University, 2000.

Academic and Professional Experience

Associate Professor, Texas Tech University. (2014 - Present).

Assistant Professor, Texas Tech University / Texas Agrilife Research. (April 1, 2011 - 2014).
Assistant Professor, Texas Tech University / Texas Agrilife Research

Assistant Professor, University of Georgia. (August 5, 2007 - March 31, 2011).
Assistant Professor, University of Georgia

Research Professional II, University of Georgia

Leadership Awards and Honors


TEACHING

Courses Taught

Texas Tech University
PSS 3323, Crop Physiology, 12 courses.
PSS 4000, Internship, 4 courses.
PSS 4001, Problems, 6 courses.
PSS 4325, Crop Water Management, 2 courses.
PSS 5001, Problems in Plant and Soil Science: Crop Physiology, 9 courses.
PSS 5329, Precision Agricultural, 1 course.
PSS 6000, Master’s Thesis, 7 courses.
PSS 6001, Selected Topics in Plant and Soil Science: Field Research Design, 3 courses.
PSS 6323, Plant-Water Relations, 11 courses.
PSS 7000, Research, 15 courses.
PSS 8000, Doctor's Dissertation, 8 courses.

**Directed Student Learning**


Safian Sanaz, Dissertation Defense Committee Co-Chair, "Estimation Crop Water Deficit Using ground cover and thermal band of medium-resolution multispectral satellite imagery.." (2014).


Cameron Oliver, Master's Thesis Committee Co-Chair, ". Comparison of Cotton Yield Components under Three Irrigation Regimes.." (2014).


Fulvio Simao, Dissertation Defense Committee Chair, "Cotton maturity over diverse environments." (2013).

Curtis Schaefer, Master's Thesis Committee Chair, "Cotton maturity over diverse environments." (2013).

Corey Thompson, Master's Thesis Committee Co-Chair, "Improving Cool Temperature Establishment in Cotton by Modifying the Fatty Acid Composition." (2013).


Heath Reeves, Master's Thesis Committee Chair, "Irrigation termination timing and effects on cotton yield and fiber quality.." (2012).

M. Chase Snowden, Master's Thesis Committee Chair, "Boll distribution and fiber quality of West Texas cotton under four irrigation levels.." (2012).


Bralie Hendon, Master's Thesis Committee Co-Chair, "Stabilization of the Naked Seeded Trait in Cotton (Gossypium hirsutum L.)." (2012).

Kevin Meeks, Master's Thesis Committee Co-Chair, "Developing salt tolerance in Safflower." (2012).

Justin Cave, Master's Thesis Committee Member, "Water use efficiency under multiple irrigation regimes." (2012).

Zachary Hinds, Master's Thesis Committee Member, "Molecular Marker Analysis of Safflower." (2012).


RESEARCH

Published Intellectual Contributions

Conference Proceeding


Journal Article, Academic Journal

Mittal, A., Jiang, Y., Ritchie, G., Burke, J., Rock, C. AtRAV1 and RAV2 overexpression in cotton increases fiber length and delays flowering. Plant Science ms #PSL-D-15-00513.


Journal Article, Professional Journal


**Presentations Given**

Rock, C. (Presenter & Author), Mittal, A. (Author Only), Ritchie, G. (Author Only), Payton, P. (Author Only), Burke, J. (Author Only), USDA Ogallala Aquifer Program 2013 Workshop, "Field testing of transgenic cotton expressing Arabidopsis ABA insensitive (ABI5) and B3-domain related to ABI3/VIVIPAROUS1 (RAV) transcription factors," USDA, Ambassador Inn, Amarillo TX. (March 5, 2013).

Mittal, A. (Presenter & Author), Jiang, Y. (Author Only), Jia, F. (Author Only), Mallick, S. (Author Only), Payton, P. (Author Only), Ritchie, G. (Author Only), Burke, J. (Author Only), Rock, C. (Author Only), Plant Abiotic Stress and Sustainable Agriculture: Translating Basic Understanding to Food Production, "Field testing of transgenic cotton expressing Arabidopsis ABA INSENSITIVE5 (ABI5) and B3-domain RELATED TO ABI3/VIVIPAROUS1 (RAV) transcription factors," Keystone Symposia, Sagebrush Inn and Conference Center, Taos, New Mexic. (January 17, 2013).


Rock, C., Mittal, A., Ritchie, G., Burke, J., 109th Annual Meeting of the Southern Association of Agricultural Scientists, "Production and Field Testing of Transgenic Cotton That Expresses
Transcription Factors for Enhanced Traits and Productivity Under Drought Stress”, S.A.A.S., Birmingham, AL. (February 6, 2012).

Contracts, Grants and Sponsored Research

Grant

Barbato, L. (Co-Principal), Woodward, J. (Co-Principal), Burow, M. (Co-Principal), Seshadri, S. (Co-Principal), Mulligan, K. (Co-Principal), Ballou, M. (Principal), Williams, R. (Co-Principal), Ritchie, G. (Co-Principal), Trojan, S. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies-TTU," Sponsored by U.S. Dept of Agriculture, $282,125.00. (September 1, 2012 - August 31, 2017).

Cao, G. (Co-Principal), Ballou, M. (Principal), Barbato, L. (Co-Principal), Mulligan, K. (Co-Principal), Burow, M. (Co-Principal), Williams, R. (Co-Principal), Seshadri, S. (Co-Principal), Mendu, V. (Co-Principal), West, C. (Co-Principal), Trojan, S. (Co-Principal), Ritchie, G. (Co-Principal), Woodward, J. (Co-Principal), Sarturi, J. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies-TTU," Sponsored by United States Department of Agriculture, Federal, $340,222.00. (September 1, 2014 - August 31, 2016).


Ritchie, G. (Principal), "USDA-ARS RSA Acquisition of Goods and Services - Ritchie," Sponsored by USDA - ARS, $8,000.00. (July 1, 2014 - June 30, 2015).


Rock, C. (Principal), Ritchie, G. (Co-Principal), Payton, P. (Co-Principal), Burke, J. (Supporting), "Field testing of transgenic cotton that express transcription factors for seed and fiber traits and productivity under drought," Sponsored by USDA Ogalalla Aquifer Program, Federal, $69,240.00. (September 30, 2011 - September 30, 2013).


Intellectual Contributions in Submission

Research Report


GENERAL

Licensures and Certifications


Professional Memberships


Jyotsna Sharma  
Texas Tech University  
jyotsna.sharma@ttu.edu

Education and Post Graduate Training

Ph D, University of Missouri, 2002.  
Major: Plant Science

MS, University of Missouri, 1998.  
Major: Plant Science

BS, University of Arkansas, 1995.  
Major: Horticulture with Business

Academic and Professional Experience

Associate Professor, Texas Tech University. (2015 - Present).

Assistant Professor, Texas Tech University. (2009 - 2015).

Assistant Professor, UF North Florida Research and Education Center. (2004 - 2008).

Leadership Awards and Honors

Metagenomics Workshop Travel Award, National Science Foundation. (2012).

National Science Foundation FIRST IV Fellow awarded to a mentor-postdoctoral fellow team, National Science Foundation. (2012).

Certificate of Appreciation, Department of Biotechnology, Kathmandu University. (2011).

Research Travel Award, West Texas Association of Women in Science. (2011).

Student Disability Services Outstanding Faculty, Texas Tech University. (2010).

TEACHING

Courses Taught

Texas Tech University

PSS 1411, Principles of Horticulture, 13 courses.
PSS 4000, Internship, 7 courses.
PSS 4001, Problems, 9 courses.
PSS 5000, Professional Internship, 2 courses.
PSS 5001, Problems in Plant and Soil Science: Biodiversity Conservation, 7 courses.
PSS 6000, Master’s Thesis, 10 courses.
PSS 6001, Selected Topics in Plant and Soil Science: Mycorrhizal Symbiosis, 6 courses.
PSS 7000, Research, 21 courses.
PSS 8000, Doctor’s Dissertation, 3 courses.
Directed Student Learning


Nick Sanford, Doctoral Advisory Committee Co-Chair, "Novel source-to-sink mechanisms and hydrogen peroxide signaling in Gossypium spp." (May 2015).

Praveen Sapkota, Doctoral Advisory Committee Member, "Water-use models for agronomic crop production in Southern High Plains." (May 2015).


Ratan Chopra, Doctoral Advisory Committee Co-Chair, "Transcriptome Sequencing on array of twenty two peanut accessions for SNP identification and development of linkage map for A genome population using SNPs selected from the array of accessions." (December 2014).

Marshall Hamilton, Master's Thesis Committee Chair, "Symbiosis of Tuber lyonii with Carya illinoiensis." (December 2014).

Natalie Dhanoolal, Master's Thesis Committee Chair, "Outdoor horticultural learning environments for elementary school students." (December 2014).

Niraj Rayamajhi, Master's Thesis Committee Chair, "Conservation genetics of rare and endemic cacti." (December 2014).

tricia Cox, Master's Thesis Committee Chair, "Online course development and teaching for university students." (December 2014).

Jarrad Davis, Master's Thesis Committee Co-Chair, "Techniques for Restoration of Shin-oak (Quercus havardii)." (December 2013).

Shi Wang, Master's Thesis Committee Chair, "Molecular identification and cultural conditions for Tuber lyonii." (August 2013).

Paulo Ricardo Almeida, Doctoral Advisory Committee Co-Chair, "Mycorrhizal fungi of the critically endangered Brazilian orchids Cattleya labiata and C. warneri." (May 2013).

Reghural Nair, Master's Thesis Committee Chair, "Microsatellite (nSSR) identification for population genetics of Cypripedium kentuckiense and Pogonia ophioglossoides." (December 2012).

Lindsey Thiessen, Master's Thesis Committee Co-Chair, "Improving upon the management of soil-borne diseases of peanut in west Texas." (May 2012).

Bryan Peterson, Master's Thesis Committee Co-Chair, "Phenotypic diversity, reproductive dynamics, and optimization of root-zone pH for nursery production of Dirca palustris." (May 2009).

RESEARCH

Published Intellectual Contributions

Journal Article, Academic Journal
Sharma, J. (2013). A common epiphytic orchid has a narrow mycorrhizal affinities.


Sharma, J. (2013). Genetic diversity and structure of Pagonia ophioglossoides (Orchidaceae) across it’s natural distribution.


Journal Article, Professional Journal

**Contracts, Grants and Sponsored Research**

**Grant**

Sharma, J. (Principal), "Collaborative Research: Testing a Microbial - Association - Distribution Hypothesis to Explain Spatial Distributions and Species Co-Existence in a Community of Epiphytic Plants," Sponsored by Ntl Science Foundation, $593,341.00. (September 1, 2014 - August 31, 2018).

Sharma, J. (Principal), "Sensitive Plants Research and Implementation at Naval Base Point Loma (NBPL)," Sponsored by Office of Naval Research, $196,020.00. (September 23, 2013 - March 19, 2016).


**GENERAL**

**Professional Memberships**


Publication Committee Member, Native Orchid Conference, Inc. (2010 - Present).


member, Native Orchid Conference. (2002 - Present).

Chief Editor, Proceedings of the 8th Native Orchid Conference Meeting, Native Orchid Conference, Inc. (2010).

ASHS Cross Commodity Publication Award Committee, American Society for Horticultural Science. (2009 - 2010).

Chair, American Society for Horticultural Science. (2009 - 2010).


Theophilus Udeigwe
Texas Tech University
(806) 834-6664
theo.udeigwe@ttu.edu

Education and Post Graduate Training

Ph D, Louisiana State University, 2008.
Major: Agronomy
Supporting Areas of Emphasis: Soil and Environmental Chemistry

MS, Louisiana State University, 2005.
Major: Agronomy
Supporting Areas of Emphasis: Soil and Environmental Chemistry

BS, University of Nigeria, 2001.
Major: Soil Science

Academic and Professional Experience

Assistant Professor, Texas Tech University Department of Plant and Soil Science. (August 1, 2012 - Present).

Research Associate, Louisiana State University Agricultural Center. (April 2009 - August 2012).

Research Associate, Louisiana State University Agricultural Center. (April 2009 - April 2010).

Graduate Research/Teaching Assistant, Louisiana State University. (August 2003 - December 2008).

Leadership Awards and Honors


TEACHING

Courses Taught

Texas Tech University
IS 5031, Internship in Interdisciplinary Studies, 2 courses.
PSS 2330, Urban Soils, 6 courses.
PSS 4000, Internship, 6 courses.
PSS 4001, Problems: Soil Chemistry, 1 course.
PSS 4330, Environmental Soil Chemistry, 3 courses.
PSS 4335, Soil Fertility and Nutrient Management, 6 courses.
PSS 5001, Problems in PSS: Laboratory Methods and Procedures, 4 courses.
PSS 5330, Advanced Environmental Soil Chemistry, 3 courses.
PSS 5331, Advanced Plant Nutrient Management, 6 courses.
PSS 6000, Master’s Thesis, 3 courses.
PSS 7000, Research, 9 courses.
PSS 8000, Doctor’s Dissertation, 1 course.

RESEARCH

Published Intellectual Contributions

Abstract


Journal Article, Academic Journal


**Journal Article, In-House Journal**


**Journal Article, Professional Journal**


Journal Article, Public or Trade Journal


Contracts, Grants and Sponsored Research

Grant


Udeigwe, T. (Co-Principal), Young, J. (Principal), "Incorporation of cultivation practices and products to reduce salinity parameters from poor water on golf course fairways," Sponsored by U.S. Golf Association, $30,000.00. (January 1, 2015 - December 31, 2016).


GENERAL
Professional Memberships


David Weindorf  
Texas Tech University  
(806) 834-5287  
david.weindorf@ttu.edu

Education and Post Graduate Training

Ph D, Texas Tech University, 2002.  
   Major: Agronomy

MS, Texas Tech University, 1997.  
   Major: Soil Science

BS, Texas Tech University, 1995.  
   Major: Range Management

Academic and Professional Experience

Associate Dean for Research, Texas Tech University. (2014 - Present).

Associate Professor & BL Allen Endowed Chair of Pedology, Texas Tech University. (2013 - Present).  
   Associate Professor & BL Allen Endowed Chair of Pedology

Assistant Professor of Soil Classification/Land Use, LSU/LSU AgCenter. (2010 - 2013).  
   Assistant Professor of Soil Classification/Land Use, LSU/LSU AgCenter, Baton Rouge, LA

Associate Professor of Soil Classification/Land Use, LSU (30% teaching)/LSU AgCenter (70% research), Soil Classification/Land Use, LSU (30% teaching)/LSU AgCenter (70% research. (2007 - 2010).  
   Associate Professor of Soil Classification/Land Use, LSU (30% teaching)/LSU AgCenter (70% research), Baton Rouge, LA

Assistant Professor of Soil Science, Tarleton State University, Texas Agricultural Experiment Station. (2001 - 2007).  
   Assistant Professor of Soil Science, Tarleton State University, Texas Agricultural Experiment Station, Stephenville, TX

TEACHING

Courses Taught

Texas Tech University
   PSS 4001, Problems, 6 courses.
   PSS 4332, Soil Classification, 2 courses.
   PSS 5334, Soils and Crops in Arid Lands, 4 courses.
   PSS 5337, Advanced Soil Classification, 2 courses.
   PSS 6000, Master's Thesis, 3 courses.
   PSS 6001, Selected Topics in PSS: Manuscript Publication in Soil Science, 2 courses.
   PSS 7000, Research, 3 courses.
   PSS 8000, Doctor's Dissertation, 3 courses.
Directed Student Learning

Beatrix Haggard, Doctoral Advisory Committee Chair.

Noura Bakr, Doctoral Advisory Committee Chair.

Somsubhra Chakraborty, Doctoral Advisory Committee Chair.

Amanda McWhirt, Master's Thesis Committee Chair.

Samantha Swanhart, Master's Thesis Committee Chair.

Sara Nuss, Master's Thesis Committee Chair.

Stephanie Johnson, Master's Thesis Committee Chair.

RESEARCH

Published Intellectual Contributions

Instructor's Manual


Journal Article, Academic Journal


Weindorf, D. (2013). Benchmark vs. state soils of the United States. Soil Hor. doi, 10.2136/sh12-10-0029..


Weindorf, D. (2013). On site assessment of metal contamination via portable x-ray fluorescence spectroscopy; Zlanta, Romania.. Environmental Pollution(182), 92-100.


Weindorf, D. (2013). Relationship of potentially labile soil organic carbon with soil quality indicators in deforested areas of Iran.. *Soil Hor..*


Weindorf, D. (2012). Evaluation of compost/mulch as highway embankment erosion control in Louisiana at the plot-scale.. *J. of Hydrol(10.1016).*


**Journal Article, Professional Journal**


**Contracts, Grants and Sponsored Research**

**Grant**


Charles West  
Texas Tech University  
(806) 742-1625  
chuck.west@ttu.edu

Education and Post Graduate Training

Ph D, Iowa State University, 1981.  
Major: Crop Production/Physiology  
Dissertation Title: Nitrogen Use Efficiency of Legume-Grass and Grass Pastures

MS, University of Minnesota, 1978.  
Major: Agronomy

BS, University of Minnesota, 1974.  
Major: Agronomy

Academic and Professional Experience

Professor and Thornton Distinguished Chair, Texas Tech University. (August 20, 2012 - Present).

Assistant, Associate, and Full Professor, Forage Physiology, University of Arkansas, (July 1, 1984 - August 17, 2012).

Leadership Awards and Honors

Award of Merit, Southern Pasture and Forage Crops Improvement Conference. (2014).

TEACHING

Courses Taught

Texas Tech University

PSS 3321, Forage and Pasture Crops, 5 courses.  
PSS 5327, Soil-Plant-Animal Interrelationships in Grazing Lands, 1 course.  
PSS 5328, Forages and Livestock in Pasture Ecosystems, 4 courses.  
PSS 6000, Master's Thesis, 2 courses.  
PSS 7000, Research, 12 courses.  
PSS 8000, Doctor's Dissertation, 4 courses.

Teaching Awards and Honors

Teaching Award of Merit, Gamma Sigma Delta, Arkansas Chapter. (April 2004).

RESEARCH

Published Intellectual Contributions

Book, Chapter in Non-Scholarly Book-New


Journal Article, Academic Journal


**Journal Article, Professional Journal**


West, C., Toland, D., Boyer, M., McDonald, G., Haggard, B. (2014). Plants influenced by growing media and compost addition on mock green roofs within the Ozark Highlands. *J Green Building, 9, 130-144.*

**Contracts, Grants and Sponsored Research**

**Grant**


Cao, G. (Co-Principal), Ballou, M. (Principal), Barbato, L. (Co-Principal), Mulligan, K. (Co-Principal), Burow, M. (Co-Principal), Williams, R. (Co-Principal), Seshadri, S. (Co-Principal), Mendu, V. (Co-Principal), West, C. (Co-Principal), Trojan, S. (Co-Principal), Ritchie, G. (Co-Principal), Woodward, J. (Co-Principal), Sarturi, J. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies-TTU," Sponsored by United States Department of Agriculture, Federal, $340,222.00. (September 1, 2014 - August 31, 2016).


**SERVICE**

**College Service**

Committee Chair, Water Center. (November 2013 - Present).

**GENERAL**

**Professional Memberships**

American Society of Agronomy.

Chair of C-6 Forage and Grasslands, Crop Science Society of America.
Jason Woodward  
Texas Tech University  
(806) 746-4053  
jason.woodward@ttu.edu

Education and Post Graduate Training

Ph D, University of Georgia, 2006.  
Major: Plant Pathology  
Dissertation Title: Optimizing disease control with fungicides in peanuts via a pre-plant risk

MS, Oklahoma State University, 2002.  
Dissertation Title: Evaluating the influence of fungicides on the nematophagous fungus Arthrobotrys

BS, Southwestern Oklahoma State University, 1999.  
Major: Biology

Academic and Professional Experience

Associate Professor and Extension Plant Pathologist, Texas AgriLife Extension Service.  
(September 1, 2011 - Present).

Assistant Professor of Plant Pathology, Texas Tech University. (2006 - Present).

Graduate Research Assistant, University of Georgia. (2003 - 2006).

TEACHING

Courses Taught

Texas Tech University

IS 1100, RaiderReady: Freshman Seminar, 6 courses.  
PSS 4001, Problems, 5 courses.  
PSS 4100, Seminar, 1 course.  
PSS 4425, Introductory Plant Pathology, 12 courses.  
PSS 5001, Problems in PSS: Plant Disease Management, 8 courses.  
PSS 5425, Advanced Agricultural Plant Pathology, 12 courses.  
PSS 6000, Master's Thesis, 9 courses.  
PSS 6001, Selected Topics in PSS: Root-knot Nematode Hosts, 6 courses.  
PSS 7000, Research, 19 courses.  
PSS 8000, Doctor’s Dissertation, 19 courses.

Directed Student Learning

Jacob Price, Dissertation Committee Chair, "Virus-vector relationships that impact small grain production in the High Plains of." (2015).

Praveen Supkota, Dissertation Committee Member, "Economic analysis of Verticillium wilt management systems in west Texas.." (2015).


Caleb Albers, Master's Thesis Committee Chair, "Influence of nitrogen on Verticillium wilt in cotton.." (2013).


Justin Spradley, Master's Thesis Committee Member, "Weed management in DGT cotton." (2013).

Zhan Yang, Master's Thesis Committee Member, "Molecular aspects of the Bacterial blight pathogen." (2013).

Lindsey Thiessen, Dissertation Committee Chair, "Improving upon the management of soilborne disease of peanut in west Texas.." (2012).

Jacob Reed, Dissertation Committee Member, "Weed management in cotton with multiple traits.." (2012).

Leslie Beck, Dissertation Committee Member, ". Integrated management of spring dead spot in bermudagrass." (2012).

Bryan Stokes, Master's Thesis Committee Chair, "Biological control of the Larger Black Flour Beetle, Cynaeus angustus Leconte (Coleopatera: Tenebrionidae) in cotton gin trash using entomopathogenic nematodes.." (2012).


Shilpi Chawla, Dissertation Committee Chair, "Population dynamics of Verticillium dahliae and Fusarium oxysporum f. sp. vasinfectum over time and their implications for disease development in cotton.." (2011).

Brent Brown, Master's Thesis Committee Member, "Sorghum response and weed management with saflufenacil.." (2010).

Aaron Alexander, Master's Thesis Committee Chair, "isolation frequency of ZXanthomanas axonopodis pv. Malvacearum from acid delinted and easiflo treated cotton seed.." (2009).

Hahn Pham, Master's Thesis Committee Member, "Molecular characterization of bacterial blight resistance genes in cotton." (2009).

Michael Krawitzky, Master's Thesis Committee Member, "Propigation success of grapevine (Vitis vinifera L.) infected with Xylella fastidiosa.." (2009).

RESEARCH
Published Intellectual Contributions

Journal Article, Academic Journal


**Journal Article, Professional Journal**


**Contracts, Grants and Sponsored Research**

**Grant**
Barbato, L. (Co-Principal), Woodward, J. (Co-Principal), Burow, M. (Co-Principal), Seshadri, S. (Co-Principal), Mulligan, K. (Co-Principal), Ballou, M. (Principal), Williams, R. (Co-Principal), Ritchie, G. (Co-Principal), Trojan, S. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies-TTU," Sponsored by U.S. Dept of Agriculture, $282,125.00. (September 1, 2012 - August 31, 2017).

Cao, G. (Co-Principal), Ballou, M. (Principal), Barbato, L. (Co-Principal), Mulligan, K. (Co-Principal), Burow, M. (Co-Principal), Williams, R. (Co-Principal), Seshadri, S. (Co-Principal), Mendu, V. (Co-Principal), West, C. (Co-Principal), Trojan, S. (Co-Principal), Ritchie, G. (Co-Principal), Woodward, J. (Co-Principal), Sarturi, J. (Co-Principal), "Improving Water Productivity and New Water Management Technologies to Sustain Rural Economies-TTU," Sponsored by United States Department of Agriculture, Federal, $340,222.00. (September 1, 2014 - August 31, 2016).

**Intellectual Contributions in Submission**

**Journal Article, Professional Journal**


Robert J. Wright
Texas Tech University
(806) 834-0163
robert.wright@ttu.edu

Education and Post Graduate Training

Ph D, Texas A&M University, 1997.
    Major: Genetics

MS, University of Arkansas, 1993.
    Major: Plant Breeding and Genetics

BS, John Brown University, 1990.
    Major: Biology

Academic and Professional Experience

Associate Professor, Texas Tech Univ. (2009 - Present).

Assistant Professor, Texas Tech Univ. (2002 - 2009).

TEACHING

Courses Taught

Texas Tech University
    PSS 3421, Fundamental Principles of Genetics, 16 courses.
    PSS 4000, Internship, 4 courses.
    PSS 4001, Problems, 5 courses.
    PSS 4321, Fundamental Principles of Plant Breeding, 1 course.
    PSS 4415, Plant Biotechnology, 6 courses.
    PSS 5000, Professional Internship, 5 courses.
    PSS 5001, Problems in Plant & Soil Science: Advanced Genetics, 5 courses.
    PSS 5301, Advanced Genetics, 2 courses.
    PSS 5321, Plant Breeding Theory, 1 course.
    PSS 5421, Genetically Modified Crops, 6 courses.
    PSS 6000, Master's Thesis, 8 courses.
    PSS 6001, Selected Topics in Plant and Soil Science, 4 courses.
    PSS 7000, Research, 16 courses.
    PSS 8000, Doctor's Dissertation, 9 courses.

Directed Student Learning

Xing Qi, Doctoral Advisory Committee Chair, "Transposon Mutagenesis for Cotton Functional Genomics." (2014).

Zhanxia Yang, Master's Thesis Committee Member, "Fine Mapping a Bacterial Blight Resistance Gene in the Cotton Cultivar S295 (Gossypium hirsutum L.)." (2013).
Kermit Price, Doctoral Advisory Committee Member, "Comparing drought tolerance of transgenic and conventional cotton lines." (2009).


Raiana King, Master's Thesis Committee Co-Chair, "Physiological aspects of the Caducous bract of Gossyium harknessil." (2009).

Hanh Pham, Master's Thesis Committee Member, "The genetic divergence among Xanthomanas axonopodis pv. malvacearumavr Bs3 loci can be explained by a series of unique deletion mutations." (2009).

Carol Mason, Master's Thesis Committee Co-Chair, "Selection of cotton genotypes with stable lint yields and fiber quality across different levels of soil moisture." (2006).

**RESEARCH**

**Published Intellectual Contributions**

**Book, Chapter in Scholarly Book-New**


**Journal Article, Academic Journal**


**Journal Article, Professional Journal**


**Contracts, Grants and Sponsored Research**

**Grant**


**GENERAL**

**Professional Memberships**

Wenwei Xu  
Texas Tech University  
wenwei.xu@ttu.edu

Education and Post Graduate Training

Ph D, University of Missouri, 1992.  
Major: Genetics

MS, Chinese Academy of Agricultural Sciences, 1985.  
Major: Crop Genetics and Breeding

BS, Gansu Agricultural University, 1982.  
Major: Agronomy

Academic and Professional Experience

Associate Professor, Texas A&M University. (2004 - Present).

Associate Professor, Texas Tech University. (2004 - Present).

Assistant Professor, Texas A&M University. (1998 - 2004).

Assistant Professor, Texas Tech University. (1998 - 2004).

TEACHING

Courses Taught

Texas Tech University

PSS 3421, Fundamental Principles of Genetics, 8 courses.
PSS 4001, Problems, 4 courses.
PSS 5001, Problems in Plant and Soil Science, 5 courses.
PSS 6000, Master's Thesis, 10 courses.
PSS 6001, Selected Topics in PSS: Phenomics & Selection in Contemporary Plant Breeding, 5 courses.
PSS 6322, Advanced Plant Breeding, 3 courses.
PSS 7000, Research, 14 courses.
PSS 8000, Doctor's Dissertation, 13 courses.

Directed Student Learning

Karl Brauer, Dissertation Committee Chair. (2013 - Present).

Teresa Gaus, Dissertation Committee Chair. (2010 - Present).

Caren Ayala, Master's Thesis Committee Chair. (2010 - Present).

Amelia Sidumo, Dissertation Committee Chair. (2012).

Bruce Spinhirne, Master's Thesis Committee Chair. (2012).
Jacob Decker, Master's Thesis Committee Member. (2012).
Nicholas Denwar, Dissertation Committee Member. (2011).
Margaret Hamill, Dissertation Committee Member. (2010).
Randall Montgomery, Master's Thesis Committee Chair. (2009).
Hanh Pham, Master's Thesis Committee Member. (2009).

RESEARCH

Published Intellectual Contributions

Journal Article, Academic Journal


Journal Article, Professional Journal


Xu, W., Ni, X., Lei, Z., He, K., Li, X., Li, X. (2014). Integrated pest management is the lucrative bridge connecting the ever emerging knowledge islands of genetics and ecology.. *Insect Science*. 


**Contracts, Grants and Sponsored Research**

**Grant**


**Intellectual Contributions in Submission**

**Journal Article, Professional Journal**

Professional Service

Committee Member, USDA U.S. Maize Crop Germplasm Committee. (2006 - 2015).

GENERAL

Professional Memberships

member, American Association for the Advancement of Science. (2015 - Present).
member, Gamma Sigma Delta. (2015 - Present).
member, Sigma Xi. (2015 - Present).
Education and Post Graduate Training

Ph D, University of Arkansas, 2013.
Major: Turfgrass Science
Dissertation Title: Physiological effects of low mowing heights, rolling, and foot traffic on creeping bentgrass putting greens.

MS, Mississippi State University, 2009.
Major: Plant Pathology
Dissertation Title: Identification of stobilurin and benzimidazole resistance in Colletotrichum cereale isolates causing anthrocnose on creeping bentgrass putting greens in the mid-south.

BS, Mississippi State University, 2006.
Major: Golf Course and Sports Turf Management

Academic and Professional Experience

Assistant Professor, Texas Tech University. (2013 - Present).
Instructor, University of Arkansas. (2010 - 2012).
Turfgrass Integrated Pest Management Instructor and Turf Bowl Instructor
Instructor, Mississippi State University. (2006 - 2009).

Leadership Awards and Honors

2007 Outstanding Graduate Student at the Master Level for Entomology and Plant Pathology Department, Mississippi State University.

2008 College of Ag. and Life Sciences Graduate Student Research Award, Mississippi State University.

2008 American Phytopathological Society Travel Award recipient.

2008 GCSAA’s Watson Fellowship Award.

2010 1st Place in Crop Science Society of America C-5 Poster Competition, Crop Society of America.

2012 Department of Horticulture Outstanding Ph.D. Graduate Student, University of Arkansas.

Golden Tusk Award Recipient for dedication to Turf Bowl Class in 2011, Turf Bowl.

Mississippi State University's Dean's List, Mississippi State University.

Pi Alpha Xi, University of Arkansas.
Gamma Sigma Delta, Texas Tech University Chapter. (2014).

TEACHING

Courses Taught

Texas Tech University

PSS 3309, Introduction to Turfgrass Science, 9 courses.
PSS 4000, Internship, 10 courses.
PSS 4001, Problems, 9 courses.
PSS 4316, Turfgrass Physiology and Ecology, 5 courses.
PSS 4318, Turf Pest Management, 1 course.
PSS 5318, Advanced Turfgrass Physiology and Ecology, 3 courses.
PSS 6000, Master’s Thesis, 3 courses.
PSS 7000, Research, 8 courses.

RESEARCH

Published Intellectual Contributions

Abstract


Journal Article, Professional Journal


Contracts, Grants and Sponsored Research

Grant

Udeigwe, T. (Co-Principal), Young, J. (Principal), "Incorporation of cultivation practices and products to reduce salinity parameters from poor water on golf course fairways," Sponsored by U.S. Golf Association, $30,000.00. (January 1, 2015 - December 31, 2016).


Young, J. (Principal), "Evaluation of Specticle pre-emerge herbicide efficacy in bermudagrass lawns based on formulation," Sponsored by Bayer CropScience, $2,500.00. (March 11, 2014 - September 15, 2014).


Intellectual Contributions in Submission

Journal Article, Professional Journal

Young, J. (2012). Ball lie of creeping and colonial bentgrass cultivars under fairway conditions – Year 2 data. (Ser. 593:30-34.).

Young, J. (2012). Ball mark severity and recovery under low mowing, rolling, and foot traffic. (Ser. 593:56-62.).


Young, J. (2012). Mowing and rolling affect wear injury from foot traffic on creeping bentgrass putting greens. (Ser. 593:88-93.).

Young, J. (2012). Rooting characteristics of creeping bentgrass as affected by mowing height, rolling, and traffic. (Ser. 593:63-66.).


Young, J. (2009). First report of Colletotrichum cereale causing anthracnose foliar blight of creeping bentgrass in Mississippi and Alabama. (77), 86-87.

Manuscript


Young, J. (2010). First report of Colletotrichum cereale causing anthracnose foliar blight of creeping bentgrass in Mississippi and Alabama. Plant Dis (92:1475 ed.).


GENERAL

Professional Memberships

Board Member, Texas Sports Turf Managers Association. (2014 - Present).

Board Member, Texas Turfgrass Association. (2013 - Present).

Board Member, West Texas Golf Course Superintendents Association. (2013 - Present).
Richard E. Zartman
Texas Tech University
(806) 742-2838
richard.zartman@ttu.edu

Education and Post Graduate Training

Ph D, University of Kentucky, 1974.
  Major: Soil Physics
  Supporting Areas of Emphasis: math minor
  Dissertation Title: Transport of nitrate nitrogen to tobacco roots

BS, Ohio State University, 1968.
  Major: Agronomy

Academic and Professional Experience

Chair, Texas Tech University. (May 2011 - Present).
J.A. Love Endowed Chair, Texas Tech University. (May 2011 - Present).
Leidigh Professor of Soil Physics, Texas Tech University. (2006 - Present).
Professor of Soil Physics, Texas Tech University. (1991 - Present).

TEACHING

Courses Taught

Texas Tech University
  PSS 2130, Urban Soils Laboratory, 3 courses.
  PSS 2330, Urban Soils, 11 courses.
  PSS 4000, Internship, 7 courses.
  PSS 4001, Problems, 4 courses.
  PSS 4336, Soil Physical Properties, 2 courses.
  PSS 5000, Professional Internship, 6 courses.
  PSS 5001, Problems in Plant and Soil Science, 9 courses.
  PSS 5231, Applied Geostatistics, 6 courses.
  PSS 5331, Advanced Plant Nutrient Management, 2 courses.
  PSS 5335, Soil Physics, 8 courses.
  PSS 5337, Advanced Soil Classification, 1 course.
  PSS 6000, Master's Thesis, 12 courses.
  PSS 6001, Selected Topics in Plant and Soil Science, 4 courses.
  PSS 7000, Research, 12 courses.
  PSS 8000, Doctor's Dissertation, 16 courses.

Directed Student Learning

Deanna Halfman, "Infiltration as a function of cropping," Plant & Soil Science.

Alejandro Amante-Orozco, Dissertation Committee Chair, "Fine particulate matter generation under controlled laboratory and wind tunnel conditions," Plant & Soil Science.

David Weindorf, Dissertation Committee Chair, "Effect of compost on soil physical properties in the Dallas metropolitan area," Plant & Soil Science.

Eli Boroda, Dissertation Committee Chair, "Ricin extraction methodology," Plant & Soil Science.

J. D. Booker, Dissertation Committee Chair, Plant & Soil Science.

Joel Basinger, Dissertation Committee Chair, "Ricin and peanut lectin transport and influence on microbial activity in soil," Plant & Soil Science.

Justin Weeaks, Dissertation Committee Chair, "Creeping Bentgrass (Agrostis stolonifera) establishment in a greenhouse using subsurface," Plant & Soil Science.


Amber Basinger, Master's Thesis Committee Chair, "Root length distribution as a function of mowing frequency and height for different moisture regimes in Texas," Plant & Soil Science.

Jenny Jo Cox, Master's Thesis Committee Chair, "Field testing a portable wind tunnel for fine dust emissions," Plant & Soil Science.

John Quillin, Master's Thesis Committee Chair, "Spatial distribution of playas on Texas High Plains," Plant & Soil Science.

J.D. Booker, Dissertation Committee Chair, "Modeling landscape-scale water balance in irrigated cotton system in the Pullman and Amarillo series." (2013).

**RESEARCH**

**Published Intellectual Contributions**

**Book, Chapter in Scholarly Book-New**

Zartman, R., Chai-Bo, C., Cobb, G., Fralick, J. A., Presley, S. M. Boca Raton, FL: Advances in Biological and Chemical Terrorism Countermeasures.

Zartman, R., Leggoe, J., Chi-Bo, C., Cox, S., Presley, S. Advances in Biological and Chemical Terrorism Countermeasures (pp. 29-104).


Journal Article, Academic Journal


Zartman, R., Ping, J., Green, C. J., Bronson, K. F., Dobermann, A. Identification of relationships between cotton yield, quality and soil properties.. 96(6), 1588-1597.


Journal Article, Professional Journal


Journal Article, Public or Trade Journal


Research Report


Presentations Given

Rainwater, K., Song, L., Cleveland, T., Schroeder, J., Fish, E., McLendon, T., Zartman, R., Arsuffi, T., Asquith, W., Presentation to Speaker of the Texas House of Representatives Joe Straus and 84th District Representative John Frullo, "Selected Recent Texas Water Research Interests and Capabilities," Office of the President of Texas Tech University, Lubbock, TX. (September 29, 2014).


Zartman, R., ASA national meeting, "AG*IDEA: A distance education program in soil water and enviromental science.," Cincinnati, OH. (2012).


Media Contributions

Radio

(April 18, 2013).

TV

KAMC-TV. (April 17, 2013).

Contracts, Grants and Sponsored Research

Grant


Sponsored Research

Nash, P. (Supporting), Liu, H. (Principal), Senadheera, S. (Supporting), Zartman, R. (Supporting), McKenney, C. (Supporting), "Technical Assistance to the Lubbock District of TxDOT (Interagency Contract Agreement)," Sponsored by Texas Department of Transportation, State, $150,000.00. (September 1, 2010 - August 31, 2011).

Intellectual Contributions in Submission

Journal Article, Academic Journal


Research in Progress
“Design of Monitoring Program for Water Yield Enhancement Program” (Complete)  
To design appropriate monitoring program which can be implemented on new or existing sites (Texas State Soil and Water Conservation Board 2008-2010).

“Evaluation of the State of Texas’ Brush Control Program: Monitoring Needs and Potential Water Enhancement” (Complete)  
To conduct project evaluations and make recommendations for future programs. (Texas Commission on Environmental Quality 2007-2008)

SERVICE

University Service

Dean’s Representative, Texas Tech University representative to the Global Networks for Desert Research Institutes. (2008 - 2013).

Committee Member, Core Curriculum Area Committee for Natural Sciences Assessment. (2012).

Committee Member, Member of the Environmental Toxicology Chair search committee. (2012).

College Service

Committee Member, Member of the CASNR ADR search committee. (2012).

Committee Member, member of the CASNR ad hoc Learning Outcomes and Assessment Committee. (2012).

Committee Member, member of the CASNR Safety Committee. (2012).

Member of the CASNR Strategic Planning and Visioning Committee. (2012).

Committee Member, Member of the CASNR Water Center committee. (2012).

Committee Chair, Superintendent of state 4H soils contest. (2012).

Committee Chair, Superintendent of the area FFA land contest. (2012).

Public Service

Board Member, State Seed and Plant Board. (December 12, 2011 - Present).

GENERAL

Licensures and Certifications

Certified Professional Agronomist, #330.

Certified Professional Soil Scientist, #330.


Licensed Professional Geoscientist, Texas 1719.
DEPARTMENT OF PLANT AND SOIL SCIENCE
TEXAS TECH UNIVERSITY
LUBBOCK, TX 79409-2122
CURRICULUM VITAE

Vivien Gore Allen
Paul Whitfield Horn Professor
Thornton Distinguished Chair
Professor, Forage-Livestock Systems and Forage Management

Education:

Professional Experience:
Paul Whitfield Horn Professor - 2005 to present
Thornton Chair and Professor, Department of Plant and Soil Science; Texas Tech University. 1995 to present.
Professor. Department of Crop and Soil Environmental Sciences. Virginia Polytechnic Institute and State University. 1993-95.
Associate Professor of Agronomy. Virginia Polytechnic Institute and State University. 1986-93.
Assistant Professor. Virginia Polytechnic Institute and State University. 1980-86.
Research Assistant. Louisiana State University. 1978-79.

Professional and Honorary Societies:
American Association for the Advancement of Science.
American Forage and Grassland Council.
American Society of Agronomy.
American Society of Animal Science.
Council for Agricultural Science and Technology.
Crop Science Society of America.
Gamma Sigma Delta.
Phi Lambda Pi, Alpha Chapter.
Sigma Xi.
Society for Range Management.
Texas Forage and Grassland Council.
Virginia Academy of Science.
Phi Kappa Phi.
**Professional Service: (selected examples)**

- Former President, Crop Science Society of America. 2001-02.
- Former Chair, International Grassland Congress Continuing Committee. 2001-05.
- Board of Trustees, Agronomic Science Foundation. 2004 to present.
- Baker Endowment Advisory Council Member. Iowa State University. 2004 - present.

**Honors and Awards:**

**Honors:**
- Outstanding Young Woman of the Year in LA. 1974.
- Fellow, American Society of Agronomy 1996.
- Fellow, American Association for the Advancement of Science. 2001.
- Faculty Associate in TTU Economic Development Resource Center. 2002.
- Member, Texas Tech University Teaching Academy, 2004.
- Paul Whitfield Horn Professorship – 2005

**Awards:**
- American Forage and Grassland Council Medallion Award. 1999.
- Barnie E. Rushing, Jr. Faculty Distinguished Research Award. 2001.
- College of Agriculture and Natural Resources Research Award. 2001.
- Gamma Sigma Delta Outstanding Contributions to Agriculture Award. 2002.
- Award of Illumination, American Forage and Grassland Council, Louisville, KY, Jan. 2008

**Principal Research Interests:**

Forage production, management, and physiology with primary interest in forage quality and antiquality factors and animal response. Grazing, metabolism, and feeding trials with animals. Forage management and forage/livestock systems with emphasis on maximizing use of forages for animal production, nutrient management and recycling to enhance sustainability of the forage/livestock
system, and integrating grazing animals into sustainable forage/livestock/cropping systems. Mineral imbalances in the soil/plant/animal system, especially as related to sulfur, nitrogen, aluminum, phosphorus, magnesium, copper and antiquality components of forages. Salinity tolerance of forage crops and use of forages to remediate saline and nutrient challenged land.

**Patents (Career Total of 10):**


**Books and Book Chapters (Career Total of 12):**


**Books and Book Chapters Edited (Career Total of 2):**


**Refereed Publications (Career Total of 82):**


Technical Publications/Popular Articles (Career Total of 68):


Electronic Media:


Abstracts and Proceedings (Career Total of 148):
Domestic (Total of 126):


International (Total of 22):


CD ROM (Total of 8):


Seminars and Presentations (Career Total of 165):
Domestic: (Total of 150)


107. Presented research on Sustainable Crop/Livestock Systems (SARE project) at the sixth annual exhibition and reception for members of Congress and their aids sponsored by the National Association of State Universities and Land-Grant Colleges (NASULGC) on March 4, 2003, Washington, DC.


113. Radio show: FRFE March 1, 2005

114. “Integrating cotton and cattle for the Texas High Plains” Houston Livestock and Rodeo group. October 20, 2005. Lubbock, TX


120. April 5, 2006. Talk at ND as a part of the “Pasture to Plate” 2006 Alabama Beef Study Tour. Producers.

121. April 27, 2006. ‘Using grazing beef cattle to restore resilience in our agricultural systems’ Graduate and undergraduate class in forage management, Angelo State University, San Angelo, TX (invited talk).

122. May 18, 2006. Talk re ND integrated systems. Undergraduate student group from University of Wyoming.

123. May 23, 2006. Talk at ND re integrated systems. Staff from CASNR.

124. June 1, 2006. Talk at ND re integrated systems. Ag Teachers and Extension Specialists.
125. June 15, 2006. 7th Annual Field Day at New Deal. Over 100 producers and others attended this event.


128. September 19, 2006. >Forages for Cow-Calf Systems= Floyd County Ag Tour, TCE and TAWC. Lockney, TX.


134. Jan. 24 - Lecture to Horse Production Class on forages for horses.


136. Feb. 6 - Managing Cow-calf Grazing Systems= Floyd County Cow/calf Beef Producer Meeting, Floyd County Unity Center, Muncy, TX


139. Feb. 8, 2007 - “Managing Cow-calf Grazing Systems,” Floyd County Cow-calf Beef Producer Meeting, Floyd County Unity Center, Muncy, TX

140. April 30, 2007 – “Promotion and Tenure Considerations for Those Entering an Academic Profession.” Lecture to class for Dr. David Doerfert, Agricultural Education and Communications, TTU.

141. May 12, 2007 – “The changing face of agriculture in the Texas High Plains.” Lubbock Round Table, Lubbock, TX (invited talk)


International: (Total of 15)


11. “Integrate Crop and Livestock Systems” October 5, 2004. Students and faculty of the College of Pastoral Agricultural Science and Technology, Lanzhou University, Lanzhou, China


Reviews:


### Principal Subject Matter for Teaching:

Forage crop ecology, forage-livestock systems, Soil-plant-animal interrelationships in grazing lands.

### Formal Courses Taught Last Six Years:

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### Formal Courses Taught Prior to Last Six Years:

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### Virginia Polytechnic Institute and State University

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### Undergraduate Courses

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### Graduate Courses

| AGRN 5040: Soil-Plant-Animal Interrelationships | -    | -    | -    | -    | -    | -    | 15    | 15    |
Workshops (Organized/Conducted) (Career Total of 1):
   a. How grasses and legumes grow and respond to grazing.
   b. Making decisions about a forage system.

Graduate Students Directed (Career Total of 28):
M.S. (Total of 15)
Virginia Polytechnic Institute and State University.


Texas Tech University.


M.S. Non-Thesis

Ph.D. (Total of 13)

Virginia Polytechnic Institute and State University.
1. Muchovej, Rosa Maria Castro. 1983. Effect of selected aluminum chelates and chelating agents on mineral nutrient composition of annual ryegrass (Lolium multiflorum Lam.) and tall fescue (Festuca arundinacea Schreb.). Department of Crop and Soil Environmental Sciences. Virginia Polytechnic Institute and State University.


**Texas Tech University.**


**Graduate Students In Progress:** (3)

**M.S.**

1. Song Cui - “Identification of legumes to reduce energy inputs, enhance profitability, and avoid additional irrigation requirements.” Anticipated graduation date – May 2011

2. Yue Li – “Grazing management of small grain cover crops to enhance cotton yields and suppress allelopathy.” Anticipated graduation date – Dec 2010

3. Cody Zilverberg – “Improving agricultural sustainability with integrated crop and livestock systems” Anticipated graduate date – May 2011

**Graduate Committees (Career Total of 82):**
Virginia Polytechnic Institute and State University.
M.S. (Total of 31)
Ph.D. (Total of 20)

**Texas Tech University.**
M.S. (Total of 12)


11. Robin Morris. Title not determined. Department of Animal Science


Non-Thesis (Total of 4):


Ph.D. (Total of 15):


**Visiting Scientists:**

**External Support:** (Principal Investigator - Career Total of $4,870,036 + $6,224,775 in a single grant from the Texas Water Development Board in 2004)


42. Allen, V. G. 1993. Use of seaweed extract to enhance growth, persistence, and quality of tall fescue and the potential of seaweed extract to alleviate tall fescue toxicity to livestock. Virginia Agricultural Council. $23,678. Funded.


<table>
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<th>No.</th>
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112. Li, Yue and V. G. Allen. 2007. Allelopathic effects of small grain cover crops on cotton plant growth and yields. USDA-SARE, Amount requested, $10,000 (funded).

113. Cui, Song and V. G. Allen. 2007. Finding a forage legume that can save water and energy and provide better nutrition for livestock in West Texas. High Plains Underground Water Conservation District. Amount requested, $10,000 (funded).


115. Allen, V. G. and multiple co-authors. Building a Sustainable Future for Agriculture. 2009. USDA-SARE program, Southeast Region. $15,000, funded.


117. Allen, V. G., Song Cui, Rick Kellison, and Phil Brown. 2009. Finding a forage legume that can save water and energy and provide better nutrition for livestock
in west Texas. High Plains Underground Water Conservation District No. 1. $63,349. (Funded).

118. Allen, V. G., S. Maas, D. Doerfert, R. Kellison and multiple co-authors. 2009. The Texas High Plains: A Candidate Site for Long-term Agroecosystem Research and Education. USDA-CSREES AFRI LTAR program. $200,000 (funded)

**Additional Grants, Donations, & Support for Teaching: (Career Total of $163,660)**


Service:
A. National Committees and Service:
   1. Ad Hoc Scientists Committee for Nat. Food Systems Security

B. University Committees and Service:
   Louisiana State University.
   1. Gamma Sigma Delta, Louisiana State University Chapter. 1979-80.

   Texas A&M University:

   2. Search Committee.
      a. Agricultural Research and Extension Center--Stephenville, TX. Forage Agronomist/Physiologist Assistant Professor. 1996.

   Texas Tech University:
   1. Faculty Workload Committee. 1997-98.


      b. President's position. 1999-present.
      d. Vice President for Research and Graduate Education. 2000.

   4. Sigma Xi. 1995-present.


   8. Dean's Representative.
Virginia Polytechnic Institute and State University.
b. President. 1990-91.
c. Secretary. 1988-89.
d. Treasurer. 1987-88.
e. Vice-President. 1989-90.
7. Horse Research Committee for Northern Virginia Agriculture Experiment Station. 1988-89.
10. Search Committees.
Iowa State University.

University of Nebraska.

C. College Committees and Service:
College of Agriculture and Life Sciences/Virginia Polytechnic.
1. Agricultural Faculty Association.
   b. President. 1990-91.
   c. Secretary-Treasurer. 1988-89.
   d. Vice-President. 1989-90.


5. Graduate Honor System Investigative Board. 1988-89.


7. Horse Research Committee for Northern Virginia Agriculture Experiment Station. 1988-89.


9. Interdisciplinary Committees.


15. Search Committees.


University of Iowa State Department of Agronomy.
1. CREES review team. 2003.

University of Nebraska Department of Agronomy and Horticulture.
1. CREES review team. 2003.

College of Agricultural Sciences and Natural Resources/Texas Tech University.

2. Search Committee.


D. Departmental Committees and Service:
Department of Crop and Soil Environmental Sciences/Virginia Polytechnic.


a. Chair. 1985-86.

Department of Plant and Soil Science/Texas Tech University.
1. Faculty Development and Budget Recommendation Committee. 1996.
3. Mentoring Committee.
   b. Dr. John Blanton. 2003.
   c. Dr. Michael Maurer. 2003.
4. Search Committee.
   a. B. L. Allen Endowed Professorship in Pedology.

E. Professional Society Service:

17. Vice-President. 1990-91.


19. Travel Grant Award Committee (Fourth International Crop Science Congress). 2004.

**American Society of Agronomy.** 1978-present.


10. ASA Centennial Committee – 2003-2008

**American Society for Animal Science.** 1983-present.


**Crop Science Society of America.** 1978-present.

1. President. 2001-02.


5. Grazing Land Forum
   a. Special Representative. 1995-98.

6. Program Planning Chair for National Meeting.

**Society for Range Management.** 1985-present.


4. TASK Group to Update Glossary of Terms. 1996.

**Southern Pasture and Forage Crops Improvement Conference.** 1987-present.

1. **Chair.** 2001.


**F. Professional / Industry Services:**


3. Consulting,


   a. Chair. 2001-05.


11. Manuscript Reviewer.
    a. Agronomy J.
    b. Crop Science.
    c. J. Animal Science.
    d. J. Production Agriculture.
    e. Magnesium.


    a. Awards Committee--Environmental Stewardship Award. 1993-97.

    a. Board of Directors. 1984-86.

15. Proposal Reviewer.
    a. Binational Agricultural Research and Development (BARD) Program.
    b. Leopold Center for Sustainable Agriculture. 1996-97.
d. United States Department of Agriculture (USDA)
   (3) Sustainable Agriculture Research and Education-Agriculture in Concert with Environment (SARE/ACE) Program. 1996.

   b. Secretary. 1984-84.


18. Regional Project S-167. Utilization of Forages for Production of Slaughter Cattle Throughout the Year. 1980-86.

   c. Chair. 1992-93.


International Experience:

1. Allen, V. G. 1983. Advised Ph.D. graduate on dissertation research conducted in Sri Lanka. Developed and taught the Animal Science graduate course, Pasture Production and Utilization. Evaluated the research, extension, and graduate and undergraduate teaching programs at the University of Peradeniya, Peradeniya, Sri Lanka.


11. Coordinated first joint meeting between the International Grassland Congress and the International Rangeland Congress with the Chinese Grassland Society to be held in Huhhot, Inner Mongolia in 2008.
Other International Experience:
I have traveled in and presented papers at meetings in Japan, France, New Zealand, Australia, Germany, Brazil, Argentina, Israel, Mexico, Belgium, the Netherlands, Korea, Canada, the United Arab Emirates, China, South Africa, Inner Mongolia, Ireland, and Scotland.
Department of Plant and Soil Science  
Texas Tech University, Lubbock, TX 79409  
Curriculum Vita  

Amber N. Bates  
Instructor of Horticulture

**Education:**  
(Anticipated graduation December 2011)  

**Professional Experience:**  
January 2008-Present, Instructor of Horticulture and PSS 1411 Laboratory Administrator  
Texas Tech University  
June 2005- January 2008, Teaching Assistant  
Texas Tech University  

**Professional and Honorary Societies:**  
American Society of Horticulture Science- Southern Region  
Pi Alpha Xi, Chapter sponsor 2008-Present  
Gamma Sigma Delta  
Phi Kappa Phi  

**Scholarships and Awards:**  
ASHS Scholars Award.  2005  
Belsterling Foundation Graduate Scholarship Award  
Benny Simpson Native Plant Scholarship  

**Formal Undergraduate Courses Taught:**

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<th>Undergraduate Courses Taught</th>
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**Guest Lecturer or Teaching Assistant:**  
PSS 2313: Herbaceous Plants – Fall 2010  
PSS 3317: Interior Plants - Spring 2010  
PSS 4411: Greenhouse Crop Production – Spring 2010  
PSS 3318: Woody Plants – Fall 2008
**PSS 1411 Lab Administrator:**
Supervised as many as 8 teaching assistants a semester.
Directed weekly meetings to train teaching assistants.
Prepared and ordered all materials needed for labs.
Directed the learning of over 1,000 students to date.

**Abstracts and Presentations:**


**Invited Presentations:**


**Thesis:**

**Dissertation Topic:**
Increasing Yield and Harvest Ease of *Oenothera elata* for Use in Cosmetics and Neutraceuticals.
Service:
A. College Committees and Service

B. Departmental Committees and Service
   Pi Alpha Xi Faculty Advisor. 2008-Present.
   Lubbock Regional Science Fair Judge. 2011.
   FFA Science Fair Judge. 2008 and 2009.
   Plant and Soil Science Graduate Council Member. 2005- Present.

C. Community Service
   Christ the King Cathedral School Science Fair Judge. 2011.
   Lubbock Memorial Arboretum Volunteer.

Professional Development:
1. TNLA. San Antonio, TX. August 2010.
2. PSS Faculty Retreat. August 2009.
3. TNLA. Dallas, TX. August 2009.
5. TNLA. Houston, TX. August 2008.
Craig William Bednarz  
Professor of Crop Physiology  
Department of Plant and Soil Science  
Box 2122  
Lubbock, TX 79409-2122  
Tel: (806)-742-2838  
Fax: (806) 747-0775  
E-mail: craig.bednarz@ttu.edu

EDUCATION:
1989   B.S.   Texas Tech University, Lubbock, TX, Agricultural Education  
1991   M.S.   Texas Tech University, Lubbock, TX, Crop Science  
1995   Ph.D.   University of Arkansas, Fayetteville, AR, Agronomy

PROFESSIONAL EXPERIENCE:
Aug. 1989 - Dec. 1991: Graduate Assistant, Texas Tech University, Lubbock, TX  
Jan. 1992 - April 1996: Graduate Assistant, University of Arkansas, Fayetteville, AR.  
April 1996 - Dec 1996: Assistant Professor, Mississippi State University, Stoneville, MS.  
Dec 1996 - April 2002: Assistant Professor, University of Georgia, Tifton, GA.  
April 2002 - March 2006: Associate Professor, University of Georgia, Tifton, GA.  
April 2006 – Sep. 2009: Associate Professor, Texas Tech University and Texas AgriLife Research, Lubbock, TX.  
Sep. 2009 – Present: Professor, Texas Tech University and Texas AgriLife Research, Lubbock, TX.

LICENSES AND CERTIFICATIONS:
Noncommercial Political Pesticide Applicator License - Texas Department of Agriculture;  
2006 to present.

INTERNATIONAL EXPERIENCE:
1. Received invitation from the Chinese Academy of Agricultural Sciences to present a paper at the 2000 International Conference on Engineering and Technological Sciences in Beijing, China.  
2. Received invitation to visit the Chinese Cotton Research Institute in Anyang, Henan China and discuss potential collaborative efforts with Chinese scientists in 2000.  
3. Received invitation from the CSIRO Plant Industry in Narrabri, NSW Australia to visit the Australian Cotton Research Institute and discuss potential collaborative efforts with Australian scientists in 2000.
MEMBERSHIP IN PROFESSIONAL AND HONORARY SOCIETIES:  (Career)

Professional:
1. American Society of Agronomy; 1990 to present
2. Crop Science Society of America; 1990 to present
3. Irrigation Association; 2006 to present
4. Texas Chapter of the American Society of Agronomy; 2006 to present
5. Texas Agricultural Industries Association; 2006 to present
6. West Texas Agricultural Chemicals Institute; 2006 to present

Honorary:
1. Gamma Sigma Delta; 1989 to present

HONORS AND AWARDS:

Honors:
1. None

Awards:
1. Outstanding Junior Research Scientist (UGA-CPES, 2000)

AREA OF EXPERTISE:

Cotton and grain sorghum water relationships and irrigation management. Management of cotton fiber quality.

PATENTS: Total of 0:

PUBLICATIONS:  (Since last promotion; use numbered lists)

Books: None

Book Chapters: None

Books and Book Chapters Edited: None.

Refereed Journals: Career total published 42; in press 1.

Published:


In Press:


Proceedings: Career total of 35

Refereed

Volunteered:


Invited:


Non-referred

Volunteered:


Invited: None

Abstracts: Career total of 65

Volunteered:


Invited:


Technical reports: Career total of 91.

Refereed


Non-refereed


Other publications: Career Total of 62


33. Minor, E. (Bednarz quoted and research highlighted) 2004. If we can fly a drone over Iraq and spy on whomever, why can’t we fly a blimp over our cotton fields? The Tifton Gazette, July, 2004.


**PRESENTATIONS AND LECTURES:** Career total of total of 226.

**CONVENTION PRESENTATIONS**


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<th>Year</th>
<th>Title</th>
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<td>1994</td>
<td>Physiological changes and potassium partitioning during the progression of potassium deficiency in cotton.</td>
<td>Physiology Brown Bag Seminar, Altheimer Laboratory, Univ. of Arkansas.</td>
</tr>
<tr>
<td>1995</td>
<td>Partitioning of potassium in cotton during the development of potassium deficiency symptoms.</td>
<td>University of Arkansas Exit Seminar, Fayetteville, AR.</td>
</tr>
<tr>
<td>1998</td>
<td>Growth and development of cotton in several population densities.</td>
<td>ASA, CSSA, SSSSA annual meetings, Baltimore, MD.</td>
</tr>
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<td>1999</td>
<td>Ultra narrow row cotton research in Georgia.</td>
<td>1999 Production Conference, Beltwide Cotton Production and Research Conferences. Orlando, FL.</td>
</tr>
<tr>
<td>1999</td>
<td>Ultra narrow row cotton research in Georgia.</td>
<td>Physiology Conference, Beltwide Cotton Production and Research Conferences, Orlando, FL.</td>
</tr>
<tr>
<td>2000</td>
<td>Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing.</td>
<td>Sigma Xi Tifton Campus seminar.</td>
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34. 2007. Within-boll yield components of high yielding cotton cultivars. World Cotton Research Conference IV. Lubbock, TX.


EXTENSION PRESENTATIONS

2. 1996. Defoliation timing. Leflore County cotton producers, Greenwood, MS.


5. 1997. Cotton physiology research at the University of Georgia Coastal Plain Experiment Station. Presented to Chinese agricultural officials from Zhejiang Province, Tifton, GA.

6. 1997. Cotton research at the University of Georgia Coastal Plain Experiment Station. Presented to Chinese agriculturalists from several Province, Tifton, GA.


10. 1998. Growth and development of cotton. UGA scout school, Tifton, GA.

11. 1998. Compensatory growth after early season fruit removal in cotton. UGA extension agent training, Tifton, GA.

12. 1998. Starter fertilizers in cotton. CCA-CEU training, Tifton, GA.

13. 1998. Growth and development of cotton in several population densities. East Georgia conservation tillage field day, Waynesboro, GA.


15. 1998. Cotton physiology research at the University of Georgia. Embrapa visitors field tour, Tifton, GA.

17. 1998. Compensatory growth after early season fruit removal in cotton. CCA-CEU training, Macon, GA.

18. 1998. Cotton physiology research at the University of Georgia. 1998 Georgia Cotton Production Conference, Tifton, GA.


20. 1999. Cotton physiology research. UGA extension winter school cotton training, Rock Eagle, GA.


26. 1999. Tillage effects on cotton growth and development. Tift-area cotton research tour. Tifton, GA.


32. 1999. Ultra narrow research trials in Georgia. Colquitt County Extension Meeting. Moultrie, GA.
33. 1999. Cotton Physiology research at CPES. Presented to Mitchell County Extension Coordinator and crop consultants. Tifton, GA.

34. 1999. Compensatory lint yield production after early season floral bud removal in cotton. 1999 Georgia Cotton Production Conference, Tifton, GA.

35. 1999. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. 1999 Georgia Cotton Production Conference, Tifton, GA.

36. 2000. Late season cotton variety test. Third Annual Southwest Georgia Cotton Field Day, Decatur County, GA.

37. 2000. Growth and development of the cotton fruit. Agent training, UGA-RDC, Tifton, GA.

38. 2000. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Irwin County cotton producers, Ocilla, GA.


40. 2000. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Pulaski County cotton producers, Hawkinsville, GA.

41. 2000. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Turner County cotton producers, Ashburn, GA.

42. 2000. Growth and development of the cotton fruit. Burke County cotton producers, Waynesboro, GA.

43. 2000. Growth and development of the cotton plant. Agent training, Rock Eagle, GA.

44. 2000. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. 2000 Wiregrass Cotton Expo, Ozark, AL.

45. 2000. Growth and development of the cotton fruit. Candler County Young Farmers, Metter, GA.

46. 2000. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. 2000 Georgia Cotton Production Conference, Savannah, GA.

47. 2000. Growth and development of the cotton fruit. 2000 Georgia Cotton Production Conference, Savannah, GA.
48. 2001. Growth and development of the cotton fruit. Agent training, Rock Eagle, GA.

49. 2001. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Decatur and Mitchell Counties crop consultants. Camilla, GA.

50. 2001. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Calhoun County growers. Morgan, GA.


52. 2001. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Early County growers. Blakely, GA.


54. 2001. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Worth County Agricultural Education Program. Sylvester, GA.

55. 2001. Cotton crop water use and irrigation scheduling. Worth County Agricultural Education Program. Sylvester, GA.


57. 2001. Cotton crop water use and irrigation scheduling. Middle Georgia Cotton Update. Cordele, GA.


60. 2001. Cotton fiber quality as a function of population density. Agent Field Day, Tifton, GA.


64. 2001. Lint quality as a function of population density and fruiting position. Tifton Campus Cotton Tour.


67. 2001. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. 2001 Georgia Cotton Production Conference, Tifton, GA.

68. 2001. Uses for cotton. Omega, GA 4th grade field trip to RDC.


70. 2002. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. 2002 Georgia Cotton Production Conference, Tifton, GA.

71. 2002. Progress in irrigation research: plant use requirements and other issues. 2002 Georgia Cotton Production Conference, Tifton, GA.


73. 2002. Cotton physiology research in the Southeast. 2002 NACAA Tour, Midville, GA.

74. 2002. Cotton growth and development. Brooks County producers meeting, Quitman, GA. Presented for 1.5 h one evening for three consecutive weeks.

75. 2002. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. 2002 Southern States GMAC Advanced Soils and Crops Training, Athens, GA.

76. 2002. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. 2002 South District ANR Agent Training, Tifton, GA.

77. 2003. Cotton crop water use and irrigation scheduling. 2003 South District ANR Agent Training, Camilla, GA.


2003. Progress on the UGA Micro-gin. Congressional Staff Tour, Tifton, GA.


2003. Cotton physiology research at UGA. 2003. AL Young Farmers Tour, Tifton, GA.

2003. Losses in yield, quality and profitability of cotton from improper harvest timing. Wiregrass Cotton Expo, Dothan, AL.


2004. The Tifton Microgin. GA Agri-leaders forum, Tifton, GA.

2004. Defoliation and harvest timing. Appling County Training, Appling County, GA.


2004. Cotton ginning. Len Lastinger Field Trip, Tifton, GA.


2004. Cotton irrigation. NPRL Field Day, Terrell County, GA.


2004. Cotton physiology research. GACCC research tour, Tifton, GA.

2004. Cotton defoliation and harvest timing. Southeast Georgia Field Tour, Midville, GA.
100. 2004. Fiber quality research. 2004 Georgia Cotton Production Conference, Tifton, GA.
101. 2004. Cotton defoliation and harvest timing. Turner County grower meeting, Ashburn, GA.
102. 2005. Cotton irrigation research at SIRP. GACCC board meeting, Camilla, GA.
103. 2005. The University of Georgia Cotton MicroGin. African Ambassador’s, Tifton, GA.
104. 2005. The University of Georgia Cotton MicroGin. LSU visitors, Tifton, GA.
105. 2005. Cotton irrigation research at SIRP. SIRP Field Day, Camilla, GA.
106. 2005. The University of Georgia Cotton MicroGin. Tifton Centennial Day for UGA, Tifton, GA.
107. 2005. Cotton irrigation research at SIRP. Southern Regional Project S1018 field day, Camilla, GA.
111. 2005. UGA cotton physiology research update. Wilcox County cotton meeting, Rochelle, GA.
112. 2005. UGA cotton physiology research update. Grady County cotton meeting, Cairo, GA.
116. 2006. Initial Experience as TTU Faculty Member. PSS Advisory Council, Lubbock, TX.


120. 2008. Comparative analysis of CWVI, seedling emergence and vigor. TX/OK Cotton Physiology and harvest Aid Study Group Meeting. Austin, TX.

121. 2008. Cotton plant densities. TX/OK Cotton Physiology and harvest Aid Study Group Meeting. Austin, TX.

122. 2008. Effects of late season glyphosate applications on cotton yield and seed quality in Roundup Ready Flex cotton. TX/OK Cotton Physiology and harvest Aid Study Group Meeting. Austin, TX.

123. 2008. Sorghum water use efficiency. TTU Sorghum Field Day. Lubbock, TX

INDUSTRY PRESENTATIONS

1. 1994. Potassium partitioning during the progression of potassium deficiency in cotton. PPI Potash fertilization of cotton research tour and workshop. Jackson, TN.


6. 2000. Harvest timing studies. Aventis Harvest-Aid Seminar, Eufala, AL.


10. 2001. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. Delta and Pine Land University, Hartsville, SC.

11. 2001. UGA micro-gin initiative. 2001 Georgia Farm Bureau Federation Annual State Convention, Jekyll Island, GA.


16. 2002. Losses in cotton lint yield, fiber quality, and profitability from improper harvest timing. FMC Georgia and Alabama consultant’s meeting, Atlanta, GA.


22. 2003. UGA irrigation research. D&PL Lower Southeast Field Training, Tifton, GA.


29. 2004. Results from Roundup Ready Flex trials. Monsanto academic meeting, Atlanta, GA.
32. 2005. Precision water placement. CCA training, Perry, GA.
33. 2005. TADS research. Bayer CropScience consultants meeting, Amelia Island, FL.
34. 2006. The 1st 40 Days. Bayer CropScience Cotton Technology Conference, San Antonio, TX.
37. 2006. The 1st 40 Days. Monsanto ICE Tour, Lubbock, TX.
42. 2008. The TTU/TAMU crop physiology teaching/research program. Bayer CropScience meeting. Lubbock, TX.
43. 2008. Irrigation termination for improved fiber maturity. TDA/FFRC meeting. Lubbock, TX.
INTERNATIONAL PRESENTATIONS


POSTER PRESENTATIONS


ASA Annual Meetings, Indianapolis, IN. Buntin, G.D., K.W. Sebold, C. Bednarz, D.V. 
Phillips and P. Raymer.

GRADUATE STUDENT COMMITTEES:

Completed

Chaired: Career total of 4

M.S.
drought tolerance of cotton (Gossypium hirsutum. L.) In Georgia
subsurface drip irrigation and overhead irrigation in Georgia cotton.
Bollgard/Roundup Ready and Bollgard II/Roundup Ready Flex cotton.

PhD.

Co-Chaired: None

Committee member: Career total of 6

M.S.
1. Henry Harris, Crop Science. 2000. Title of thesis: Glyphosate-resistant cotton: weed and 
insect pest management.
of cotton under drought stress.
genotypes for shade tolerance and rate of spread.

Ph. D.
1. Scott Bundy, Entomology. 1999. Title of dissertation: Dynamics and seasonal abundance of 
the common arthropod pests and predators associated with a cotton soybean ecosystem,
with an emphasis on stink bugs (Heteroptera: Pentatomidae)


In progress:

Chair: Career total of 7

M.S.
1. Jason Sneed, Crop Science. Anticipated Completion Date: Fall 2009
2. Emmett Muennink, Crop Science. Anticipated Completion Date: Fall 2009
4. Heath Stoerner, Crop Science. Anticipated Completion Date: Fall 2008
5. Lu Feng, Crop Science. Anticipated Completion Date: Fall 2008
6. Rob Millings, Crop Science. Anticipated Completion Date: Remove

Ph.D.
1. Cory Mills, Agronomy. Anticipated Completion Date: Spring 2010

Co-Chair: None.

Committee member of: Career total of 8.

M.S.
1. Aaron Alexander, Crop Science. Anticipated Completion Date: Fall 2008
2. Chen Chen, Crop Science. Anticipated Completion Date: Fall 2008
3. Laura Offutt, Crop Science. Anticipated Completion Date: Fall 2009
4. Randall Nelson, Crop Science. Anticipated Completion Date: Fall 2009
5. Yue Li, Crop Science. Anticipated Completion Date: Fall 2009

Ph.D.
1. Amanda Broome, Horticulture. Anticipated Completion Date: Fall 2008
2. Langani Phiri, Ag. Economics Anticipated Completion Date: Spring 2009
3. Steve Oswalt, Agronomy Anticipated Completion Date: Spring 2010

UNDERGRADUATE ADVISING:
I am advising 15 undergraduate majors all of which are Environmental Crop and Soil Sciences Majors. None are research fellows.

TEACHING RESPONSIBILITIES:

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### Craig Bednarz

**FIVE YEAR SUMMARY OF TEACHING EVALUATIONS**

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<th>Number of Students</th>
<th>Instructor Overall (Question #1) Mean</th>
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New Faculty – No Evaluations Available

### Other Teaching Responsibilities

- Coach of the TTU Agronomy Team
- Undergraduate Advisor for the Department of Plant and Soil Science.

### Grants and Awards:

**Total Funded:** Career: $5,197,419.00

**Total since arrival at Texas Tech University, April 2006 to present:** $596,698.60

### Funded:

Pre-1997
1. P.I. Understanding and improving the efficiency of foliar feeding cotton with potassium nitrate to improve lint yield and quality. Fluid Fertilizer Foundation. $2,000. 100%

2. P.I. Changes in cotton (Gossypium hirsutum L.) leaf metabolism during the progression of potassium deficiency, Sigma Xi Grants-in-Aid of Research. $1,200. 100%

1997

3. P.I. Characterization of the fruiting growth curve used in crop monitoring: Georgia Cotton Incorporated. $5,175. 100%

4. P.I. Characterization of cotton growth and development under several population densities, Georgia Agricultural Commodity Commission for Cotton. $32,000, 100%

5. P.I. Cotton physiology and management studies; Georgia Agricultural Commodity Commission for Cotton. $12,000, 100%

1998

6. P.I. Effect of delayed harvest on lint yield and fiber quality of cotton University of Georgia Research Foundation. $5,000. 100%

7. Co.-Pl. Canola-cotton double cropping systems. Georgia Agricultural Commodity Commission for Canola. $10,000. 25%

8. P.I. Characterization of the fruiting growth curve used in crop monitoring: Georgia; Cotton Incorporated. $5,175. 100%

9. P.I. Defoliation timing using COTMAN, Cotton Incorporated. $4,240. 100%

10. P.I. Cotton physiology and management studies, Georgia Agricultural Commodity Commission for Cotton. $17,500. 100%

1999

11. P.I. Cotton physiology and management studies. Georgia Agricultural Commodity Commission for Cotton. $35,000. 100%

13. P.I. Characterization of the fruiting growth curve used in crop monitoring: Georgia. Cotton Incorporated. $5,175. 100%

14. P.I. Defoliation timing using COTMAN. Cotton Incorporated. $4,240. 100%

2000

15. P.I. Cotton physiology and management studies. Georgia Agricultural Commodity Commission for Cotton. $35,000. 100%

16. P.I. Cotton Irrigation and Water Management Studies. Georgia Agricultural Commodity Commission for Cotton. $35,000. 100%


18. P.I. Defoliation timing using COTMAN. Cotton Incorporated. $4,240. 100%

2001

19. P.I. Cotton physiology and management studies. Georgia Agricultural Commodity Commission for Cotton. $35,000. 100%


21. P.I. Effects of cotton maturity classification on episodic drought tolerance. Georgia Agricultural Commodity Commission for Cotton. $5,000. 100%

22. P.I. Determining cotton variety maturity classification and its effect on adaptation to the Southeastern Coastal Plain. Cotton Incorporated. $12,000. 100%

2002

23. P.I. Determining cotton variety maturity classification and its effect on adaptation to the Southeastern Coastal Plain. Cotton Incorporated. $13,000. 100%

24. P.I. Effects of cotton maturity classification on episodic drought tolerance. Georgia Agricultural Commodity Commission for Cotton. $5,000. 100%

25. P.I. Cotton crop management and physiology. Georgia Agricultural Commodity Commission for Cotton. $37,000. 100%
26. P.I. Cotton crop water use. Georgia Agricultural Commodity Commission for Cotton. $30,000. 100%

27. P.I. Timing of initial and final irrigations in cotton. Georgia Agricultural Commodity Commission for Cotton. $18,750. 100%

28. P.I. Irrigation frequency versus irrigation volume. Georgia Agricultural Commodity Commission for Cotton. $18,750. 100%

29. Co-P.I. Seedling management in a canola-cotton double crop system. Southern Region Canola Research Program. $13,320. 50%.


2003


33. P.I. Cotton crop management and physiology. Georgia Agricultural Commodity Commission for Cotton. $48,000. 100%

34. P.I. Timing of initial and final irrigations in cotton. Georgia Agricultural Commodity Commission for Cotton. $37,500. 100%

35. P.I. Irrigation frequency versus irrigation volume. Georgia Agricultural Commodity Commission for Cotton. $37,500. 100%


37. Co-P.I. Enhancing fiber quality of Southeastern U.S. Cotton II: Labor Request. Georgia Agricultural Commodity Commission for Cotton. $150,000. 34%.

38. Co-P.I. Effects of glyphosate on herbicide resistant cotton fiber quality. Georgia Agricultural Commodity Commission for Cotton. $4,500. 50%.

2004

39. P.I. Effect of an upper limit temperature threshold on heat unit calculations, defoliation timing, yield and fiber quality: GA. Cotton Incorporated. $6,000. 100%
<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Funded by</th>
<th>Amount ($)</th>
<th>Percentage</th>
</tr>
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<tr>
<td>40</td>
<td>P.I. Yield, quality and profitability of cotton produced with subsurface drip versus overhead sprinkler irrigation systems. Cotton Incorporated.</td>
<td>$15,000</td>
<td>100%</td>
<td></td>
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<tr>
<td>41</td>
<td>P.I. Stability of cotton lint yield and fiber quality as related to transgenics and seed size. Cotton Incorporated.</td>
<td>$20,000</td>
<td>100%</td>
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</tr>
<tr>
<td>42</td>
<td>P.I. Cotton crop management and physiology. Georgia Agricultural Commodity Commission for Cotton.</td>
<td>$51,000</td>
<td>100%</td>
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<tr>
<td>43</td>
<td>Co-P.I. Cotton fiber quality 2003. USDA - CSREES.</td>
<td>$417,884</td>
<td>75%</td>
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<tr>
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<td><strong>2005</strong></td>
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<tr>
<td>44</td>
<td>P.I. Effect of an upper limit temperature threshold on heat unit calculations, defoliation timing, yield and fiber quality: GA. Cotton Incorporated.</td>
<td>$6,000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>P.I. Vacuum harvesting system for cotton. Cotton Incorporated.</td>
<td>$10,000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>P.I. Yield, quality and profitability of cotton produced with subsurface drip versus overhead sprinkler irrigation systems. Cotton Incorporated.</td>
<td>$15,000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>P.I. Effect of cultivar type and seed size on stability of yield and fiber properties. Cotton Incorporated.</td>
<td>$20,000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>P.I. Georgia cotton crop management and physiology. Georgia Agricultural Commodity Commission for Cotton.</td>
<td>$51,000</td>
<td>100%</td>
<td></td>
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<tr>
<td>49</td>
<td>P.I. Cotton irrigation and defoliation management using remote sensing. Georgia Agricultural Commodity Commission for Cotton.</td>
<td>$46,845</td>
<td>100%</td>
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<tr>
<td>50</td>
<td>Co-P.I. Cotton fiber quality 2003. USDA - CSREES.</td>
<td>$438,918</td>
<td>75%</td>
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<tr>
<td></td>
<td><strong>2006</strong></td>
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<td></td>
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<tr>
<td>51</td>
<td>P.I. Initial observations of peanut yield components. APRES.</td>
<td>$4,500</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>P.I. Yield, quality, profitability and drought avoidance of cotton produced at varying plant densities. ICRC.</td>
<td>$58,000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>P.I. Identifying and Ameliorating the Sources of Short Fibers in Cotton. ICRC.</td>
<td>$60,000</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>P.I. Phenological, Morphological and Physiological Traits to Increase Sorghum Yield on Limited Water Supplies. USDA.</td>
<td>$58,946</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
55. P.I. International Center for Excellence in Agricultural Genomics and Biotechnology. $118,000. 100%

56. Co-P.I. Integrated Plant Stress Research Program. TTU Vice President for Research. $315,000. 10%.

2007

57. P.I. Crop termination to optimize cotton yield, quality and profitability in the Texas High Plains. Cotton Incorporated Texas State Support Committee. $30,000. 100%

58. P.I. Stability of cotton lint yield and fiber quality as related to cotton seed oil content. Cotton Incorporated. $25,000. 100%


60. P.I. Sorghum water use efficiency. USDA/Kansas State University. Great Plains Sorghum Improvement and Utilization Center. $58,946. 100%

61. Co-P.I. Field treatments’ impact on cotton fiber length uniformity. Cotton Incorporated Texas State Support Committee. $20,000. 50%.

62. Co-P.I. Genetic variability, environment and agronomic practices: Impacts on cotton fiber length distribution. Texas Department of Agriculture Food and Fibers Research Grant Program. $40,000. 20%.

63. Co-P.I. Mechanisms of drought tolerance in cotton. Cotton Incorporated Texas State Support Committee. $30,000. 33%.

64. Co-P.I. A Texas Tech University initiative towards sequencing the cotton genome. Texas Tech University Vice President for Research. $999,000. 10%.

65. Co-P.I. Variable rate seeding for dryland cotton in the Texas High Plains. USDA-CSREES Ogallala Initiative. $26,498. 50%.

66. Co-P.I. Integrating grain crops into a cotton-based production system for the High and Rolling Plains: Optimizing profitability through efficient management of water resources. Texas Cropping Systems Program. $225,000. 8%.

67. P.I. Irrigation termination for improved fiber maturity on the Texas High Plains. Texas Department of Agriculture Food and Fibers Research Grant Program. $14,000. 100%
68. Co-P.I. Castor production for Texas to meet high-value industrial oil and bioenergy uses. TAES Bioenergy Initiative. $50,000. 10%.

2008

69. P.I. Irrigation termination for improved fiber maturity on the Texas High Plains. Texas Department of Agriculture Food and Fibers Research Grant Program. $14,000. 100%

70. P.I. Crop termination to optimize cotton yield, quality and profitability in the Texas High Plains. Cotton Incorporated Texas State Support Committee. $30,000. 100%

71. P.I. Stability of cotton lint yield and fiber quality as related to cotton seed oil content. Cotton Incorporated. $25,000. 100%

72. P.I. Irrigation termination for improved fiber maturity on the Texas High Plains. TTU-ICRC. $50,721. 100%

73. Co-P.I. Production and testing of transgenic cotton that expresses transcription factors for enhanced seed traits and productivity under drought stress. TTU-ICRC. $42,357. 50%.

74. P.I. Water Use Efficiency. Bayer CropScience. $24,822. 100%

75. P.I. CY953, CY954, CY956 and GH08NRIS01. Monsanto $103,500. 100%

Pending: None currently

Cash and Gifts-in-Kind

Funded:

1997

1. P.I. Various unrestricted support in 1997 from the following: Rhone-Poulenc, MicroFlo, Griffin, Donlar Corporation, BASF, Foundation for Agronomic Research, Monsanto, Morse Enterprises, Hydro Agri, Helena and CropChem totalling $29,355. 100%.

1998

1. P.I. Various unrestricted support in 1998 from the following: Rhone-Poulenc, Uniroyal Chemical, Griffin, Helena, AgrEvo, Pursell Technologies, BASF, Monsanto, Alpine Plant Foods, Inc., Hydro Agri, and elf atochem totaling $36,800. 100%
1999
1. P.I. Various unrestricted support in 1999 from the following: Rhone-Poulenc, Uniroyal Chemical, Griffin, AgrEvo, BASF, and elf atochem totalling $35,000. 100%

2000
1. P.I. Various unrestricted support in 2000 from the following: Uniroyal, Griffin, BASF, EDEN Biosciences, Delta and Pine Land Company, Stoneville, UCB and Aventis totaling $44,250. 100%

2001
1. P.I. Various unrestricted support in 2001 from the following: Uniroyal, Griffin, BASF, EDEN Biosciences, Delta and Pine Land Company, Stoneville, UCB FMC Corporation, Nichino America and Aventis totaling $58,950. 100%

2002
1. P.I. Various unrestricted support in 2002 from the following: Uniroyal, FMC, Bayer, EDEN Biosciences, Delta and Pine Land Company, UCB, UAP, Aventis, Griffin, and Cerexagri totaling $44,640. 100%

2003
1. P.I. Various unrestricted support in 2003 from the following: Uniroyal, Bayer, Delta and Pine Land Company, Monsanto and Griffin totaling $34,340. 100%

2004
1. P.I. Various unrestricted support in 2004 from the following: Syngenta, Uniroyal, Bayer, Delta and Pine Land Company, Monsanto and DuPont, Farm Saver, Loveland, Nichino, FMC and Valent totaling $75,800. 100%

2005
1. P.I. Various unrestricted support in 2005 from the following: Syngenta, Chemtura, Bayer, Delta and Pine Land Company, Monsanto and DuPont, Nichino, FMC and Valent totaling $98,000. 100%

2006
1. P.I. Various unrestricted support in 2006 from the following: Bayer, Monsanto, BASF and MicroFlo totaling $53,500. 100%

2007
1. P.I. Bednarz, C. 2007. Industry support from Monsanto, Bayer CropScience, D&PL, AMVAC, Stoller Enterprises, AgroFresh, Excel Ag, Dupont, and Arysta. $90,500. 100%

SERVICE TO PROFESSIONAL ORGANIZATIONS

54
National:

   c. Chair, crop physiology session, ASA, CSSA, SSSA Annual Meetings, Minneapolis, MN, 2000.
   e. Appointed as Associate Editor of Agronomy Journal, 2004.
   i. Chair, American Society of Agronomy Meetings, Salt Lake City, UT. 2005.

2. Crop Science Society of America (member since 1990)
   b. Member of Crop Science Society of America C462 “Crop Science Teaching Award Selection Committee”. 2000.
   d. Chairman of Crop Science Society of America C462 “Crop Science Teaching Award Selection Committee”. 2002.
   e. Member, Crop Science Society of America C451 “Crop Science Research Award Committee”. 2004.
   g. Member, Crop Science Society of America C451 “Crop Science Research Award Committee”. 2005.
   h. Member, Crop Science Society of America C455 “Fellows Committee”. 2005.
   i. Member, Crop Science Society of America C455 “Fellows Committee”. 2006.
   j. Appointed as Associate Editor of Crop Science. 2007

3. National Cotton Council
   c. Chair, cotton physiology session, Beltwide Cotton Production and Research Conferences, Orlando, FL. 1999.


h. Member, Beltwide Uniform Cotton Defoliation Workgroup. 2001.

i. Chair, cotton physiology session, Beltwide Cotton Production and Research Conferences, Atlanta, GA. 2002.

j. Judge, poster competition, Beltwide Cotton Research and Production Conferences, Atlanta, GA. 2002.

k. Member, Beltwide Uniform Cotton Defoliation Workgroup. 2002.

l. Chair, cotton physiology session, Beltwide Cotton Production and Research Conferences, Nashville, TN. 2003.

m. Member, Beltwide Uniform Cotton Defoliation Workgroup. 2003.


o. Member - Beltwide Cotton Physiology Steering Committee. 2007.


Regional: None.

State:

1. Texas Chapter of the American Society of Agronomy (member since 2006)

2. Member – Texas-Oklahoma Cotton Physiology and Harvest Aid Group. 2007

3. Member – Texas Ag Industries Association. 2008


**OTHER PROFESSIONAL SERVICE:**

1. Texas Chapter of the American Society of Agronomy
   a. Board Member. 2006.
   b. Vice President. 2007.
2. West Texas Agricultural Chemicals Institute Board of Directors. 2006-2008

CONSULTING ACTIVITIES


SERVICE TO:

UNIVERSITY:

1. Texas Tech University TEACH mentor for Cory Mills.

COLLEGE:

1. Selection committee member for the new Associate Dean for Academic Affairs. 1998.
3. Member, Tifton Campus Awards Committee. 2003
4. Aided in congressional staff tour of the Tifton Campus. 2004-2005:
6. Member of the Tifton campus graduate program committee. 2004-2005.
8. Member of the Tifton Campus AES program internship committee. 2004 – 2005.
10. CASNR Scholarship Committee member. 2006.
15. Guest on the AgTalk program on the local FOX radio station. 2007.


DEPARTMENT:

1. Selection committee member for the Crop Physiology/Management position in Athens. 1998.


5. Selection committee member for the South District Agriculture and Natural Resources Program Development Specialist. 1999.


7. Member of the department graduate program committee. 2004 – 2005.

8. Selection committee member for new turfgrass faculty at TTU. 2006.


10. TTU PSS Recruitment, Retention and Recognition committee member. 2006.

11. TTU PSS Farm Operations committee chair. 2006.

12. TTU PSS Website Improvement committee member. 2006.


COMMUNITY:


INDUSTRY:

OTHER:
Since my appointment date (April, 2006), I have developed four courses. While these courses have been offered by our department for many years, I redesigned them all as new courses with new lecture notes and other new teaching materials. In my opinion, for my courses to be truly mine, I must redesign and redevelop each of them.

Each fall I offer PSS 3323, Crop Physiology. The majority of these lectures describe the factors that determine crop yield (available and intercepted solar radiation and the efficiency of photosynthesis, respiration and carbon partitioning). The remaining lectures describe crop abiotic stresses and mechanisms to avoid/tolerate these stresses. Each spring I offer PSS 3322, Grain, Fiber and Oilseed Crops. Lectures for this class focus on the distribution and use, growth and development and management strategies for our most economically important crops. The fall semester of odd years I offer PSS 4325, Crop Water Management. Lectures for this class include hydraulics, pumps, irrigation systems, soil and plant water relationships and methods to monitor soil and plant water status. Advancements in engineering have resulted in irrigation systems that are as much as 98% efficient in water delivery. However, without proper maintenance or the proper tools and knowledge to monitor soil and plant water status, these efficiencies may be greatly degraded. This course is intended to equip students with the knowledge to become efficient irrigators. The spring semester of even years I offer PSS 6323, Plant and Soil Water Relationships. Lectures for this course focus on the physical and chemical properties of water, cell and tissue water relations, soil water relations, atmospheric demand, water transport, water use efficiency and drought resistance mechanisms. In the near future crops that have been genetically modified for improved water use efficiency will become available. A much better understanding of plant and soil water relationships will be needed to maximize the benefits offered by these technologies. This course is also intended to equip students with the knowledge to become efficient irrigators.

The slim profit margins received by growers have been offset somewhat by increased farm sizes. Most farming operations, however, are as large as current technology will allow. Unfortunately, profit margins continue to be compressed primarily by high energy costs. In my opinion, future profitability in production agriculture will greatly if not entirely depend on education. Future agronomists will need advanced knowledge of crop production, physiology, water relations and irrigation management to remain profitable. In all of my classes I emphasize this point and provide examples to illustrate why it is important the students understand the lecture material.

One final point I would like to make regarding teaching is it definitely has its advantages. Not only is it very rewarding for me to work with students, it has also helped me become a much better agronomist and scientist. This is without a doubt the most rewarding position I have ever held.
Teaching responsibilities: Means for all courses

<table>
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<tr>
<th></th>
<th>Number of Courses</th>
<th>Number of Students</th>
<th>Question #1 Mean</th>
<th>Question #2 Mean</th>
<th>Question #4 Mean</th>
<th>Question #7 Mean</th>
<th>Contact Hours</th>
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<td>Craig Bednarz</td>
<td>6</td>
<td>132</td>
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<td>4.53</td>
<td>4.56</td>
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<td>TTU</td>
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</tbody>
</table>

Scale for evaluations: 5 = excellent; 4 = outstanding; 3 = good; 4 = fair; 1 = poor

PEER EVALUATIONS:

ADVISING RESPONSIBILITIES:
I am currently advising 15 undergraduate Soils, Crops and Environmental Sciences majors. None are research fellows.

GRADUATE STUDENT COMMITTEES:
Students completed:
- Chair or Co-chair: 4
  - Member: 6
Students in progress:
- Chair or Co-chair: 7
  - Member: 8

INVITED LECTURES:
I have not been invited to lecture in a classroom setting.

PROFESSIONAL DEVELOPMENT:
1. 2006: TTU Provost New Faculty Orientation.
2. 2006: TTU TLTC Jumpstart Program “How to Ruin Lectures with Powerpoint”.
3. 2006: TTU TLTC Jumpstart Program “Involving and Engaging Students”.
4. 2006: TTU TLTC Jumpstart Program “Research, Teaching and Service”.
5. 2006: TTU TLTC Jumpstart Program “Using Rubrics to Assess Learning”.
7. 2006: TTU TLTC Jumpstart Program “Why I Chose WebCT”.
14. 2006: Attend American Society of Agronomy meetings in Indianapolis, IN.
15. 2006: Attend Beltwide Cotton Conferences in San Antonio, TX.
16. 2006: Attend Great Plains Sorghum Conference in Concordia, KS.
17. 2007: Attend Grant Writing Seminar sponsored by the Texas Tech University
       Office of Research Services.
18. 2007: Completed Radiation Safety Training sponsored by the Texas Tech
       University Environmental Health and Safety department.
19. 2007: Completed Radiation Safety Training sponsored by Troxler Electronic
       Laboratories, Dallas, TX.

PUBLIC SERVICE:
1. Convention presentations: 35 (5 at TTU)
2. Extension presentations: 123 (11 at TTU)
3. Industry presentations: 43 (10 at TTU)
4. International presentations: 2 (0 at TTU)
5. Poster presentations: 22 (3 at TTU)

AWARDS AND HONORS:
I have not received an honor or award for teaching.
CANDIDATE’S SUMMARY OF RESEARCH EFFECTIVENESS:

I have been asked several times throughout my career to write an interpretative summary of my research for popular press outlets. My research has also been mentioned multiple times in these publications. Thus far, I have 62 popular press publications, most of which were written by a professional journalist that mentioned my research or opinion on a particular aspect of cotton production. My research has always focused on producer related questions. The fact that my research has appeared in many newspaper and magazine articles is evidence that my research has had impact.

One of the reasons I accepted my current position is it would allow me to conduct research in the areas of irrigation management and plant and soil water relations, which have always been of great interest to me. Our current studies are designed to investigate the differences between plant, agronomic and economic water use efficiencies. We know with adequate irrigation very substantial lint yields are possible in this region. However, from an economic standpoint the highest yields may not be the most water use efficient. Other current studies are designed to investigate the relationships between irrigation termination and lint yield and fiber quality. Much of the fiber produced in this region is somewhat immature, which is related to excessive late season irrigation and delayed crop maturity.

As we all understand, adequate facilities to conduct research are key to a successful program. Throughout my career I have spent much time and funding to improve the research facilities, equipment and instrumentation made available to me. Since my appointment with Texas Tech, new irrigation equipment has been installed on our research farms. Tractors, farm implements, neutron moisture meters, a gas exchange system and other research equipment and instrumentation have also been purchased.

I see myself in an enviable position among my colleagues. I work in the largest cotton production region in the U.S. I also work in the areas of irrigation management, water relations and drought tolerance, which are areas of renewed interest. In addition, I have available to me research infrastructure that few scientists have. Thus, I have the tools to answer questions that few others possess.
PATENTS: none

PUBLICATIONS (career total):
  Books: 0
  Chapters in books: 0
  Refereed publications: 39
  Abstracts: 65
  Technical reports: 91
  Popular press: 11

PRESENTATIONS:

  Domestic
    Volunteered: 103
    Invited: 123
  International
    Volunteered: 0
    Invited: 2

RESEARCH FUNDING:

$5,197,419 – $596,698 while at TTU

HONORS AND AWARDS:

Outstanding Junior Research Scientist (UGA, 2000)

REVIEWER FOR:

Agronomy Journal since 2000
Crop Science since 2000
Appointed Associate Editor of Agronomy Journal in 2004
Appointed Associate Editor for Crop Science in 2006

CONSULTATIONS:

Consultant to Bayer CropScience, Lubbock, TX 2006.
Consultant to Monsanto, St Louis, MO, 2007.
SUMMARY OF PROFESSIONAL SERVICE ACTIVITIES
CANDIDATE’S SUMMARY OF SERVICE EFFECTIVENESS:

Since my appointment date I have become the faculty advisor for the Agronomy Club. Prior to my arrival club activities were minimal. We now hold meetings twice a month, have club representatives that attend Ag. Council and SOAC meetings, hold fundraisers, attend field tours and attend the annual meeting of Students in Agronomy, Soils and Environmental Sciences (SASES), which is the undergraduate student organization of the American Society of Agronomy (ASA). Last October we attended the SASES meeting for the first time. This meeting is held in conjunction with the international ASA annual meeting. We participated in several activities while there, one of which was the National Quiz Bowl Competition. We won! I also serve on the department’s Farm Operations Committee as chair. This August we held our first annual Texas Technology Tour. This was an opportunity for our scientists and industry partners to highlight our research. Approximately 122 people attended. I am often asked to speak at extension or industry functions. I consider it an honor to receive such invitations. Some aspect of my research or teaching programs must be highly regarded for me to receive a speaking invitation. It would certainly reflect poorly if I declined such an invitation. It would reflect poorly not only on me, but on Texas Tech University and Texas AgriLife Research as well. To date I have delivered 123 extension and 43 industry presentations. Simply put, if I am asked to speak, I go if at all possible. My service role, however, not only consists of speaking engagements. I am also currently a board member of the Texas Agricultural Industries Association and the West Texas Agricultural Chemicals Institute (WTACI). I am currently the Vice President/Program Chair of the WTACI. I have also served as Vice President/Program Chair of the Texas Chapter of the American Society of Agronomy and currently serve as President. One very distinct benefit I have found from making myself available to my clientele is that it harnesses support for my program. Not only support in terms of research finding, but also support in terms of funding for new infrastructure. In my previous position, this type of support resulted in the construction of a $2 million micro-gin facility. In my current position it has resulted in the installation of new irrigation infrastructure for my research programs. This is more-or-less a cyclical benefit. The more support I can harness for my program the more productive my research program, which harnesses more even support.
UNIVERSITY:
1. Texas Tech University TEACH mentor for Cory Mills.

COLLEGE:
1. Selection committee member for the new Associate Dean for Academic Affairs. 1998.
6. Member of the Tifton campus graduate program committee. 2004-2005.
7. Member of the Tifton Campus AES program internship committee. 2004 – 2005.
10. CASNR Scholarship Committee member. 2006.
15. Guest on the AgTalk program on the local FOX radio station. 2007.

DEPARTMENT:
1. Selection committee member for the Crop Physiology/Management position in Athens. 1998.
5. Selection committee member for the South District Agriculture and Natural Resources Program Development Specialist. 1999.
7. Member of the department graduate program committee. 2004 – 2005.
8. Selection committee member for new turfgrass faculty at TTU. 2006.
10. TTU PSS Recruitment, Retention and Recognition committee member. 2006.
11. TTU PSS Farm Operations committee chair. 2006.
12. TTU PSS Website Improvement committee member. 2006.

**AWARDS AND HONORS:**
None for service

**COMMUNITY:**

**SCIENTIFIC SOCIETIES:**
National:
   c. Chair, crop physiology session, ASA, CSSA, SSSA Annual Meetings, Minneapolis, MN, 2000.
   e. Appointed as Associate Editor of Agronomy Journal, 2004.
   g. Chair, American Society of Agronomy Meetings, Salt Lake City, UT. 2005.
   h. Chair, American Society of Agronomy Meetings, Salt Lake City, UT. 2004.

2. Crop Science Society of America (member since 1990)
   b. Member of Crop Science Society of America C462 “Crop Science Teaching Award Selection Committee” 2000.
   c. Chairman of Crop Science Society of America C462 “Crop Science Teaching Award Selection Committee” 2001.
   d. Chairman of Crop Science Society of America C462 “Crop Science Teaching Award Selection Committee” 2002.
   e. Member, Crop Science Society of America C451 “Crop Science Research Award Committee” 2004.
   f. Chair, Southern Branch American Society of Agronomy meetings, Biloxi, MS 2004.
   g. Member, Crop Science Society of America C451 “Crop Science Research Award Committee” 2005.
h. Member, Crop Science Society of America C455 “Fellows Committee” 2005.
i. Member, Crop Science Society of America C455 “Fellows Committee” 2006.
j. Appointed as Associate Editor of Crop Science 2007.

3. National Cotton Council

b. Chair, cotton physiology session, Beltwide Cotton Research and Production Conferences, San Diego, CA 1998.
c. Chair, cotton physiology session, Beltwide Cotton Production and Research Conferences, Orlando, FL 1999.
s. Chair session, International Conference on Engineering and Technological Sciences, Session 6, Technology Innovation and Sustainable Agriculture, Beijing, China. 2000.
t. Chair, cotton physiology conference, Beltwide Cotton Production and Research Conferences, Anaheim, CA. 2001
u. Member, Beltwide Uniform Cotton Defoliation Workgroup. 2001.
v. Chair, cotton physiology session, Beltwide Cotton Production and Research Conferences, Atlanta, GA. 2002.
w. Judge, poster competition, Beltwide Cotton Research and Production Conferences, Atlanta, GA. 2002.
x. Member, Beltwide Uniform Cotton Defoliation Workgroup. 2002.
y. Chair, cotton physiology session, Beltwide Cotton Production and Research Conferences, Nashville, TN. 2003.
z. Member, Beltwide Uniform Cotton Defoliation Workgroup. 2003.
bb. Member - Beltwide Cotton Physiology Steering Committee. 2007.
cc. Chair – Beltwide Cotton Physiology Book Committee. 2007.

4. State:

a. Texas Chapter of the American Society of Agronomy (member since 2006)

INDUSTRY:

1. West Texas Agricultural Chemicals Institute Board of Directors. 2006-2008
2. Vice President/Program Chair - West Texas Agricultural Chemicals Institute. 2008

**OTHER:**
None.
Education:
B.S. Texas Tech University. 1965. Agronomy (Crops).

Professional Experience:
Associate Dean (College of Agricultural Sciences and Natural Resources), Co-Director (International Cotton Research Center), and Piper Professor. Texas Tech University. 2008 - Present
Associate Dean (College of Agricultural Sciences and Natural Resources), Associate Director (International Cotton Research Center), and Piper Professor. Texas Tech University. 2006 - 2008
Associate Dean (College of Agricultural Sciences and Natural Resources), Associate Director (International Cotton Research Center), and Piper Professor. Texas Tech University and Texas Agricultural Experiment Station. 1999-2006.
Associate Dean (College of Agricultural Sciences and Natural Resources) and Piper Professor. Texas Tech University and Texas Agricultural Experiment Station. 1998-1999.
Piper Professor and Associate Chair (PSS). Texas Tech University and Texas Agricultural Experiment Station. 1997-98.
Piper Professor of Agronomy. Texas Tech University and Texas Agricultural Experiment Station. 1996-97.
Piper Associate Professor of Agronomy. Texas Tech University and Texas Agricultural Experiment Station. 1995-96.
Associate Professor. Texas Tech University and Texas Agricultural Experiment Station. 1993-95.
Associate Professor. Department of Plant and Soil Science. Texas Tech University. 1976-93.
Assistant Professor. Ohio State University. 1970-76.

Professional and Honorary Societies:
Alpha Zeta
American Men of Science
American Society of Agronomy
American Society of Agronomy--Texas Chapter
Association of Official Seed Analysts
Crop Science Society of America
Gamma Sigma Delta
International Seed Testing Association
International Society for Seed Science
National Association of Colleges and Teachers of Agriculture
Outstanding Young Men in America
Phi Kappa Phi
Sigma Xi
West Texas Agricultural Chemicals Institute
Who's Who in the Midwest
Who's Who in the Southwest

Professional Accreditations:
Certified Professional Agronomist (formerly)
Certified Professional Crop Scientist (formerly)

Honors and Awards:
Honors:
Agronomy Club Honorary Member. Department of Plant and Soil Science, Texas Tech University. 1983-84.
International Center for Arid and Semiarid Land Studies Associate. Texas Tech University. 1997.

Awards:
Distinguished Agronomy Faculty Award. Ohio State University. 1972.
Teacher of the Semester. College of Agricultural Sciences, Texas Tech University. 1978-79.
Spencer A. Wells Faculty Award. Texas Tech University. 1979.
Teacher of the Semester. College of Agricultural Sciences, Texas Tech University. 1984-85.
Mortar Board/Omicron Delta Kappa Outstanding Faculty Member Award. Texas Tech University. 1985.
Teacher of the Semester. College of Agricultural Sciences, Texas Tech University. 1989-90.
**Principal Research Interests:**
Seed Physiology: seed germination, seed coating, seedling vigor, seedling establishment, and cold tolerance.

**Books and Book Chapters (Career Total of 2):**


**Refereed Publications (Career Total of 13):**


**Technical Publications/Popular Articles (Career Total of 11):**


Abstracts and Proceedings (Career Total of 81):


Seminars and Presentations (Career Total of 87):


**Principal Subject Matter for Teaching:**
Introductory Agronomy and Introductory Seed Science courses for graduate and undergraduate students.

<table>
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<tr>
<th>Course</th>
<th>Acad. Yr.</th>
<th>Sem.</th>
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<td>5.00</td>
<td>4.24</td>
<td>5.00</td>
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</table>
Workshops (Organized and Conducted):


Graduate Students Directed (Career Total of 38):
M.S. (Total of 29)


Ph.D. (Career Total of 6)


**Non-Thesis (Career Total of 3)**


**Graduate Students In Progress (Total of 0):**

**Recent Graduate Committees:**

**M.S.**


Ph.D.


Non-Thesis

Undergraduate Fellows (Career Total of 1):

External Support:


44. Hopper, N. W. 1997. Field site preparation for High Plains of Texas corn research. Texas Corn Producers Board. $20,000. Funded/TTU.


49. Hopper, N. W. and J. Gannaway. 1997. The selection of late-season cold tolerance by cultivar seedling response. Cotton, Inc. $10,000. Funded/TTU.


52. Hopper, N. W. 1998. Evaluation of polymer coating cottonseed on germination and emergence. Stockhausen. $1,000. Funded/TTU.


54. Hopper, N. W. 1998. Evaluation of various harvest-aid chemicals and timing of application on cotton yield, lint, and seed quality. Uniroyal Chemical Company. $20,000. Funded. ($5,000 TTU; $15,000 TAEX)


58. Hopper, N. W., J. Gannaway, and R. Boman. 1998. Evaluation of variable plant spacing of cotton on emergence, growth, yield, and lint and seed quality. Texas Agricultural Experiment Station Precision Agriculture Project. $30,000. (Account manager of $20,000.) Funded/TAES.


International Cotton Research Center—served as Associate Director/Director/Co-Director since 1999. As part of duties associated with the ICRC, I have prepared and submitted the proposal each year for this project (Congressional earmark funding). In addition, I have sent out the RFP for individual project funding, had the projects reviewed, and allocated funding to the selected projects. Additional responsibilities have included preparing progress reports and CRIS reports.

Funds administered since 1999:

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<td>2009-2010</td>
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Service:

A. University Committees and Service:
   Texas A&M University/Texas Agricultural Experiment Station.


Texas Tech University.
1. Admission and School Relations Faculty Review Committee. 2001-03.
3. Campus Security and Emergency Committee. 2 years. Chair, 1 year.
5. Faculty Workload Policy Committee. 1998-00.
8. Land Use Planning Committee (Campus Master Plan). College of Agricultural Sciences and Natural Resources Representative. 1997.
10. Service Learning Advisory Committee. 2002-03.
12. TEACH Committee. 2000-present.
15. University Orientation Committee. 2002-03.
B. **College Committees and Service:**

**College of Agricultural Science and Natural Resources.**

1. 4-H Club. Advisor. Two-year term.


7. Curriculum Committee.


9. FarmHouse Fraternity. Associate Member.


11. Land Use Planning Committee (Campus Master Plan). 1997-98.

   d. Dr. Eduardo Segarra. 1998.
   e. Dr. Don Ethridge. 2001.


17. Search Committees.


C. Departmental Committees and Service:
Department of Plant and Soil Science.


3. Course Scheduling Committee. Multiple years.


5. Curriculum Committee. Multiple years.

6. Future Farmers of America Cotton Contest Superintendent. Multiple years.

7. Faculty Development and Budget Recommendation Committee. Multiple years.


10. New Deal Research Farm.
    b. Dean's Advisory Committee Tour. 1996.
    c. Director. 1997-98.


    c. Farm Manager position. 1997.


D. **Professional Society Service:**

**American Society of Agronomy.**

**American Society of Agronomy, Texas Chapter.**
2. Board of Directors. 1977-79.

**Association of Official Seed Analysts.**
1. *Journal of Seed Technology.*
   a. Associate Editor. 1987-00.

**Crop Science Society of America.**
2. Nomination Committee
      1) Chair. 1993.


   a. Chair. 2002


West Texas Agricultural Chemicals Institute.

2. Secretary. 1983-84.

E. Professional / Industry Service:
1. Beltwide Cotton Production and Research Conference Workshop. Variety


5. KAMC TV Spots.
   b. Importance of good quality cottonseed. (Interviewer: Stephanie
      Rogers) 1996.

6. KFYO Radio Spots.
   b. Seed testing of cottonseed. (Interviewer: Jim Stewart) 1996.

7. KLBK TV Spot.


F. Community Service:
1. Church activities. 1994-present.

G. Professional Development:


3. Hopper, N. W. 2000. Traveled to China to interact with scientists at Shandong Agricultural University and at the Xinjiang Academy of Agricultural Science. Spent about 8 days visiting with scientists concerning cotton production and presenting lectures. May.


Selected activities associated with Associate Dean position:

- Served as CASNR representative to Agricultural Consortium of Texas (ACT- 14 institutions in Texas that offer BS degrees in agriculture and natural resources). Served as President- elect and President and currently serving as Treasurer.

- Served as CASNR representative to American Association of State Colleges of Agriculture and Related Resources (AASCARR- 60+ non-land-grant institutions in the US that offer degrees in agriculture and natural resources). Served two terms as Chair of the Legislative Committee.

- Served as CASNR representative to the Board on Agricultural Assembly (BAA) for Assoc. Of Public and Land-grant Universities (APLU—formerly NASULGC). Served as Chair-elect and Chair of the Southern Section of the Academic Programs Section for the southern academic deans.

- Serve as Advisor to the Student Agricultural Council.

- Served as faculty leader on two Study Abroad trips for our students to China (2006 and 2008 with another trip in the planning for 2010).

- Authored and signed several MOAs with universities in Tajikistan, Turkey, India, China, Mexico, and Brazil to establish exchange programs.

- Serve as graduate advisor for the Master of Agriculture program.

- Helped to establish CASNR’s Peace Corps Masters International (PCMI) program where students take graduate courses for one year, serve 27 months in the Peace Corp, return to campus for a final oral exam and then receive the Master of Agri. degree.

- Serve as CASNR’s representative to AG*IDEA (Agriculture* Interactive Distance Education Alliance)—a consortium of universities cooperating in establishing distance degree and certificate programs. Currently serve on the Executive Board of Directors.

- At TTU, serve on Administrative Council (CASNR), Academic Council (TTU), and Associate Deans Council (TTU).

- In CASNR, work with all aspects of academic programs (including curriculum), the scholarship program, and the congressional internship program.
• As previously noted, currently serve as Co-director of the International Cotton Research Center.

• Work with the Student Services Center in their mission of recruiting, retaining, and placing students in employment following graduation.

• Work with other members of the Dean’s Office, the Development Office, and Departments to maintain contacts and relationships with industry and commodity representatives and donors.

• Chaired search committees for most recent Chairs of the Department of Plant and Soil Science and Agricultural Education and Communications.

• Served on search committees for the CASNR Dean and CODE Dean and currently serving on the search committee for the Dean of the A&S College.
**CURRICULUM VITAE**

Full name: Christian Nansen  
Date of birth: 7 November 1969  
Born: Glostrup, Denmark  
Nationality: Danish  
Marital status: Married to Maria Brito Almeida Nansen  
Children: Pablo, Miriam, and Emma  
Home contact: chrnansen@yahoo.com

**Education**

**Ph.D. in zoology (March 1998 - December 2000)**  
Affiliation: Royal Veterinary and Agricultural University (Denmark).  
Research: stored product insect ecology, field trapping with pheromone traps, experimental work on pheromone production, vegetation analysis, satellite image interpretation, laboratory infestation of potential breeding substrates, and histological studies.  
Funding: a total of 527,294 D.kr (approximately $75,000) was obtained from a competitive grants program at the Danish Council for Developing Research at Danida.  
Supervisor: Dr. Susanne Harding (suha@kvl.dk).

**M.Sc. in biology (September 1989 - December 1995)**  
Affiliation: University of Copenhagen (Denmark).  
Dissertation title: The *Apis mellifera* foraging response to the pollen availability in *Cistus salvifolius*.  
Research: Fieldwork was conducted in Portugal and included pollen identification, observations on daily flight and foraging activity, and modeling of pollen availability.  
Funding: provided by the Danish Ministry of Education.  
Supervisor: Dr. Hans Dreisig.

**International exchange student (March 1993 - March 1994)**  
University of Lisbon, Portugal through the exchange program of the European Union, ERASMUS.

**Professional experience**

Jan 2007 –  
Department of Entomology, Texas A&M, Texas Agricultural Experiment Station, 1102 E FM 1294, Lubbock, Texas 79403, USA  
Assistant Professor (75%). Responsible for research program on arthropod pests in maize, sorghum and wheat production system. Main focuses include: spatial ecology, development of sampling plans, landscape ecology, and behavioural ecology.  
Department of Plant and Soil Sciences, Texas Tech University, Campus Box 42122, Lubbock, TX 79409, USA  
Assistant Professor (25%). Teach and supervise graduate and undergraduate students.

Exosect Limited, 2 Venture Road, Chilworth Science Park, Southampton SO16 7NP, United Kingdom. Phone + 44 (0)23 8076 3838
Senior Research Scientist. Exosect Ltd (www.exosect.com) promotes innovative techniques utilising patented electrostatic and magnetic powder technology for the control of insect pests in agriculture, horticulture, forestry, amenity, animal and public health. The responsibilities included: 1) supervision of five research technicians of which three were M.Sc. students at the University of Southampton, 2) execution of field and laboratory experiments mainly in United Kingdom, France, Portugal and the US, 3) presenting Exosect research results in peer-reviewed publications, conferences and trade shows, 4) writing grant proposals, and 5) establishing and maintaining collaborative links with fellow researchers around the World.

October 2004- July 2005
Steritech Group Inc., 7600 Little Avenue, Charlotte, NC 28226.
Phone + 704 971 6642, Fax 704 544 8705
National Technical Director. The Steritech Group Inc. is a private pest prevention company with annual revenue of about $40 mio. Steritech services close to 12,000 commercial accounts. The responsibilities included: technical support to about 400 pest control specialists in 25 branches nationwide, development of service protocols, editor of bimonthly internal newsletter, and oversight of inhouse technical training programs. The position involved frequent traveling to branch offices, collaboration with universities and private manufacturers on development and testing of pesticides and pest control related equipment.

July 2003 to Oct 2004
Montana State University, Department of Entomology
333 Leon Johnson Hall, PO Box 173020, Bozeman, MT 59717, USA,
Phone + 406 994 6132, Fax: + 406 994 6029
Visiting Research Scientist. A 100% research position on wheat stem sawfly (Cephus cinctus) ecology with the following research responsibilities: 1) examine the possibility of using hyperspectral imagery for detection of wheat stem sawfly infestations, and 2) examine spatial distribution patterns at different geographical scales of wheat pathogens, wheat stem sawflies, and wheat stem sawfly parasitoids. The position was funded by USDA, CREES, Western Regional integrated pest management (IPM), Montana Agricultural Experiment Station. Apart from my actual assignment, I was involved in lecturing of both undergraduate and graduate students. Supervisor: Dr. David K Weaver (weaver@montana.edu).

Oklahoma State University, Dept of Entomology & Plant Pathology
127 Noble Research Center, Stillwater, Oklahoma 74078, USA
Phone: + 405 744 9764, Fax: + 405 744 6039
Assistant Researcher. A 100% research position on stored-product insect pests within the following areas: (1) community analysis of stored product insects, (2) modeling of temporal trends in trap catches (e.g. development of weather-driven flight activity models), (3) spatial distribution analysis of insects in retail stores, (4) accuracy assessment of contour mapping techniques, (5) behavioral studies of pyralid moths – with particular emphasis on ovipositing females, and (6) evaluation of semiochemical-based integrated pest management tools. The research position was funded by USDA, Cooperative and State Research, Education and Extension Service in the Risk Avoidance and Mitigation Program, agreement no. 00-51101-9674. Supervisor: Dr. Thomas W Phillips (tomp@okstate.edu).

February 2001 – Aug 2002
Oklahoma State University, Dept of Entomology & Plant Pathology
Post Doctoral Fellow. Same responsibilities as for the position as Assistant Researcher (see above).

August 1997 - August 2000
International Institute of Tropical Agriculture (IITA), 08 BP 0932 Tri Postal
Cotonou, Benin. Phone: + (229) 350188, Fax: + (229) 350556.
Junior Professional Officer in the Stored Product Pest Management Group. The position was
funded by the Danish International Development Agency (Danida). Through the Stored Product
Pest Management Group, the appointment involved development and evaluation of decision
support tools for smallholders’ maize storage systems. The responsibilities included extensive
fieldwork in Benin, Ghana, Nigeria, and Togo through participatory research trials with local
farmers. In addition, the appointment involved laboratory experiments, development and
maintenance of databases, budget management, supervision of local staff members, and
collaboration with local agricultural research institutions.

July to August 1997
Danish Pest Infestation Laboratory. Skovbrynet 14, 2800 Lyngby, Denmark
Phone: + (45) 45878055, Fax: +(45) 45931155.
Research Assistant. Responsible for field testing of a Eucalyptus oil based mosquito repellent and
for research activities in a project on biological control of Mediterranean Flour Moth (Ephestia
ekuehniella) in Danish flour mills, and the project was financed by the Danish Ministry of Food
and Agriculture (contract number BI096-SSL-14).
Supervisor: Senior Researcher Lise Steengard Hansen (l.s.hansen@ssl.dk).

March - June 1997
Roedovre High School. Hendriksholms Boulevard 28, 2610 Roedovre
Phone: + (45) 36700210.
Employed as high school teacher in biology. Cell biology, general ecology, human physiology,
photosynthesis, pollination, and herbivory were some of the topics, which were taught to three
classes each with three weekly lessons.

November 1995 - March 1997
Museum, Laboratory & Botanical Garden. Faculty of Science, University of Lisbon
Rua Escola Politécnica 58, 1294 Lisbon, Portugal.
Research Assistant. Conducted field and lab work for two projects financed by the Commission of
the European Comity: 1) Climate change and coastal evolution in Europe (contract number
EV5V-CT94-0445); 2) Forest response to environmental stress at timberline (contract number
ENV4-CT95-0063). Main responsibilities: 1) pollen identification from pit mire samples; 2)
vegetation studies in a mountainous part of Portugal; 3) interpretation of SPOT 3 satellite image
using MIPS (Map and Image Processing Software).

Languages

Danish: Native language
English: Fluent
Portuguese: Fluent
French: Conversation
German: Conversation
Grants Received

Grant title: Pheromone-based suppression of stored-product moths using attracticides
Amount of funds: $188,774 was provided by USDA National Research Initiative, Biologically-Based Pest Management Program.
Principle Investigators: Thomas W. Phillips (PI), Christian Nansen (Co-PI)
Dates: 2003-2005
Research: Develop attracticide and mating disruption approaches for Stored-Product Moths.

Grant title: Improvement and field validation of an oviposition bait station for the Indianmeal Moth.
Amount of funds: $75,179 was provided for this two-year project by the Regional integrated pest management competitive grants program for the Southern Region by the United States department of agriculture cooperative state research education and extension service.
Principle Investigators: Christian Nansen (PI), Thomas W. Phillips (co-PI), Nurhan Dunford (co-PI), and Jack W. Dillwith (co-PI). After leaving Oklahoma State University, Dr. Thomas W. Phillips continued as the project PI.
Dates: August 2003 - July 2005
Research: The main objective of this project is to improve and field-validate an attractant for Indianmeal Moth females to be used in novel trapping devices. The research includes behavioral studies under controlled conditions and spatial interpretations of field trap catches.

Grant title: Field validation of an insect flight activity model as a decision-support tool for when to fumigate stored wheat in Oklahoma.
Amount of funds: $4,700 was provided for this one-year project by the Division of Agriculture at Oklahoma State University.
Principle Investigators: Christian Nansen and Dr. Thomas W. Phillips
Research: development of a weather driven flight activity model for the rusty grain beetle, *Cryptolestes ferrugineus*, around steel grain elevators in Oklahoma. Unbaited sticky trap catches are placed on the outside of steel bins, and weather parameters are used to characterize the seasonal variation in beetle flight activity.

Grant title: Stored grain insect pest model: Implementation and validation for lesser grain borer and rusty grain beetle
Amount of funds: $14,500 was provided for this one-year project by the Division of Agriculture at Oklahoma State University
Principle Investigators: Albert Sutherland, Dr. Thomas W. Phillips, Dr Peter Edde, Christian Nansen, Dr Jim Criswell.
Research: Collect additional validation data for an existing model and have the weather driven flight activity model build into an agricultural website (http://xagweather.mesonet.org/models/storedgrain/default_lgb.php).

Additional professional activities

Supervised an undergraduate project, which was awarded $4,000 by the Lew Wentz Foundation. The project concerns spatial analysis of pheromone-baited trap catches of the Indianmeal Moth, which is one of the most important stored-product pests on processed cereal food products. The project was conducted from fall 2002 to fall 2003.

Completed 4-day course on hyperspectral data analysis and image processing provided by Analytical Imaging and Geophysics, Boulder, Colorado, 8-11 September 2003.

Lectured cell biology for undergraduate students and integrated pest management for graduate students during the spring of 2004 at Montana State University.

**Conferences**


Organizer of informal conference titled: Contour Mapping and Interpretation of Spatial Insect Counts, at the annual meeting of the Entomological Society of America in Fort Lauderdale, Florida, November 17-20 2002.


**Undergraduate externships and practicals**

January – March 1993

Scientific assistant on an expedition within “Project Arctic Fox” in North-Western Greenland. Responsible for hunting and trapping polar foxes in the region around Thule Airbase and in fjords around Soenderstroem. Project Leader, Dr. Christian Kapel. Financed by the Commission of Scientific Investigation in Greenland.


Conducting interviews with farmers and collecting data during three expeditions to North-Western Brazil. The results from these expeditions were published in a book about sustainable agriculture in deforested rainforest areas in Brazil. Financed by Columbusfonden.

March – September 1989

Scientific assistant on an expedition to the Austmanna Valley in Mid-Western Greenland. The objective was to observe and collect information about a wild population of domestic sheep. Project Leader, Dr. Christian Kapel. Financed by the Commission of Scientific Investigation in Greenland.

**Peer-reviewed publications**


**Conference proceedings and working papers**

1. **Nansen C**, C Armsworth, L Barton, I Baxter (In press) Using proprietary adhesive powders as carriers of active ingredients in advanced control of the Mediterranean Fruit fly and other important pests. IOBC working papers.


**Other publications**


**Conference presentations**


Curriculum Vitae

Megha N. Parajulee, Ph.D.
Professor, Faculty Fellow, and Texas A&M Regents Fellow
Texas A&M AgriLife Research and Extension Center
1102 East FM 1294, Lubbock, TX 79403
Ph: (806) 746-6101, Fax: (806) 746-6528
E-mail: m-parajulee@tamu.edu

I. Education

Associate Degree in Agriculture. Institute of Agriculture and Animal Sciences, Kathmandu, Nepal (1979-1982).


II. Professional Experience

Current Position

Sep 2012-current Professor, Faculty Fellow, and Regents Fellow/Cotton Entomology Program Leader, Texas A&M AgriLife Research and Extension Center (75% research/25% extension), Lubbock, TX.

Jan 2004-current Adjunct Faculty, TTU Department of Biological Sciences, Lubbock, TX. Member of the Graduate Faculty, Texas Tech University (October 2001-current) and Texas A&M University (February 2002-current).

Past Positions and Experiences

Jul 87 - Jan 90 Assistant Lecturer-Entomology, Institute of Agriculture, Rampur, Nepal.

Jan 90 - May 94 Research Assistant, Department of Entomology, UW-Madison, WI.

Jun 94 - Jun 96 Postdoctoral Research Associate, Department of Entomology, Texas A&M University, College Station, TX.

Jul 96 - Jan 00 Research Associate, Texas Agricultural Experiment Station, Vernon, TX.

Feb 00 - Aug 01 Research Scientist, Texas Agricultural Experiment Station, Vernon, TX.

Sep 01 - Aug 06 Assistant Professor/Cotton Entomology Program Leader (research 75%), Texas Agricultural Experiment Station (now Texas A&M AgriLife Research). Joint appointment with Texas Tech University (teaching 25%) in the Department of Plant and Soil Science, Lubbock, TX.

Sep 06-Aug 10 Associate Professor/Cotton Entomology Project Leader (Texas AgriLife Research/Texas Tech University), Lubbock.

Sep 10-Aug 12 Professor and Faculty Fellow/Cotton Entomology Project Leader (Texas AgriLife Research 75%, Texas Tech Univ. teaching 25%), Lubbock.
**Current Position Description:**

**FUNCTION:** Cotton Entomologist. Individual will develop and implement a strong research program in cotton entomology that attracts extramural funding. It will include ecology and management of cotton pests to support timely IPM research to ensure continued profitable cotton production in the Texas High Plains. Individual will collaborate and coordinate with scientists affiliated with the Texas Tech University and Texas AgriLife Research cotton programs, Texas AgriLife Extension, USDA-ARS, and scientists at TAMU College Station on aspects of entomology and associated production of cotton. Individual will also be expected to guide graduate student research, teach a course at TTU and participate in professional activities at international, national, regional, and local levels.

**SCOPE:** Research will mainly focus on field experiments designed to understand biology and behavior of cotton arthropods in the Texas High Plains. This program will interact with other scientists to provide a framework for cropping systems sequences and strategies related to arthropod management. Research will be based at the Texas AgriLife Research and Extension Center at Lubbock, Texas.

**DUTIES AND RESPONSIBILITIES:** Responsibilities include project leadership in the development of integrated approaches of arthropod management in cotton, with laboratory and field experimentations. The researcher will conduct research independently and as part of a multidisciplinary team, publish results of work, procure contract and grant funding, develop and sustain a strong graduate training program, communicate effectively with producers, agribusiness, industry, students, government agency personnel, and academic audiences through writing and public speaking.

**III. Teaching**

**Program Statement, Teaching Philosophy, and Accomplishment**

Dr. Parajulee had a joint appointment of research (75% Texas A&M University AgriLife Research) and teaching (25% Texas Tech University Plant and Soil Science Department) from September 2001 to August 2012. He was expected to teach one course per year as part of his 25% teaching appointment with TTU. Because he taught two courses (Advanced Insect Ecology and Economic Entomology), both graduate level courses, he offered these courses in alternate years. In addition, he taught a piggyback undergraduate course, Integrated Pest Management, simultaneously with Economic Entomology, until 2008. He also offers special topic courses on insect morphometry, molecular entomology, and cotton IPM field research every year.

Because Dr. Parajulee’s teaching appointment was with Texas Tech University, which is about 10 miles from the Lubbock Center, this portion of his appointment required extra effort and careful planning to balance research and teaching efforts at two institutions. Nevertheless, his passion for teaching made this joint task very rewarding. His commitment to this activity has been reflected on his teaching evaluations. Dr. Parajulee has received an overall student evaluation rating of 4.83 (out of 5.00) during the past 10 years of teaching. This level of rating puts him at or near the top amongst the departmental faculty (total of 23). The primary objectives of Dr. Parajulee’s teaching program were to educate students about ecological concepts applicable to integrating pest management strategies, with a broad objective of reducing unilateral reliance on chemical control and advancing the use of biological and cultural methods. He places a high premium on students learning the concepts and the processes as to ‘how’ and ‘why’ rather than ‘what,’ to motivate students to be able to learn on their own without being intimidated by complexity. Seventeen students have earned M.S. and three have earned Ph.D. degrees through his program during the last 10 years. Currently, there are two Ph.D. students working under his direction, and
in addition, he serves on two other Ph.D. student committees. He has high expectations of his graduate students, but he also takes a high degree of responsibility to ensure their proper training and marketability after graduation.

Dr. Parajulee is extremely proud of the professional growth and academic achievements of students in his laboratory. Every student for whom he served as Major Professor received one or more scholarship/fellowship awards during their graduate work in his program. He places a high priority on training graduate students to think critically, conduct quality research and disseminate the research findings to target clientele, engage in professional services, and to develop strong ethical standards in public discourse. The various scholarships and fellowships bestowed upon them, as well as their presentations of research outcomes at local producer meetings, Entomological Society of America meetings, Beltwide Cotton Conferences, and International Conferences reflect success in fulfilling that priority.

**Creativity in Teaching and Students’ Qualitative Evaluation of Teaching Performance**

Dr. Parajulee expects high teaching-learning standards in his class (see Teaching Philosophy above), which sometimes creates a false sense among students (in the beginning, at least) that he is a “difficult” and “uncompromising” professor. Students are partly correct in their perception, because they are expected to engage fully in the class rather than simply taking the class for the purpose of obtaining a grade. Both courses taught required significant project assignments, multiple in-class and take-home exams, a class presentation, and a lecture. Each student had to prepare a lecture on a pre-determined topic (assigned at the beginning of the semester) in consultation with the instructor, and then must actually deliver said lecture with all audio-visual preparations. Students were required to provide an in-depth report on their project assignments and exams were to be evaluated based on critical thinking and “reasoning” of the answers they provide as opposed to simple, straightforward answers. While few students complain that it was too much for a 3-h course, the instructor received very positive comments at the completion of the courses. One student from the Biology Department said “I greatly appreciate your efforts in shaping up this course in a new and different style. It is something different, but I liked it.” Yet another student wrote on his/her instruction evaluation sheet, “Out of all my instructors, from undergraduate on up through graduate school, none of them have taught me as much as Megha. He is an exceptional instructor. I would highly recommend him to anyone thinking of taking a class from him. I really enjoyed his class and look forward to having him for another class.” However, not all students in the class gave this type of review. Another student wrote, “It was an extremely interesting and worthwhile course, but a bit too involved for the credit hours earned.” These statements exemplify the quality and rigor of Dr. Parajulee’s teaching program.

**Teaching Seminar and Guest Lectures**

- Co-taught a graduate seminar class (Spring, 2005) at Texas Tech University, with special emphasis on preparation of effective oral and poster presentations. Used several posters and slide presentations from research program (former and current graduate students’ presentations) to highlight examples of effective and less-than-effective presentations.

- Invited speaker in Plant and Soil Science Seminar Class, April 24, 2004. Title: *Practical comments on experimental design and analysis of field research data.*

• Invited speaker in Plant and Soil Science for a 3-hour guest lecture on Turf Insect Pest Management, February 13, 2007. Title: Integrated pest management in turf ecosystems.

Direction of Graduate Students

1. Current students (Ph.D.):

Major Advisor
Dylan Wann (May 2015)
Justin Fiene (December 2012)

Committee Member
Saranya Ganapathy (May 2013)

2. Graduate Council Representative on Doctoral Advisory Committees:
- Eric Raymond Paul, Ph.D., Department of Biological Sciences (May 2006).
- Sujatha Venkataramani, Ph.D., Department of Biological Sciences (Dec. 2006).
- Nilesh Chitnis, Ph.D., Department of Biological Sciences (Dec. 2007).
- Vijaykumar Veerappan, Ph.D., Department of Biological Sciences (May 2008).
- Justin Weinheimer, Ph.D., Department of Agricultural Applied Economics (Dec. 2008).
- Binod Maharjan, Ph.D., Department of Industrial Engineering (Dec. 2010).
- Nicholas N. Denwar, Ph.D., Department of Plant and Soil Science (Dec. 2010).
- Shyam Adhikari, Ph.D., Department of Agricultural and Applied Economics (May 2011).
- Dil Kumar Gurung, Ph.D., Department of Mechanical Engineering (Dec. 2011).
- Benjamin Williams, Ph.D., Department of Clinical Psychology (Dec. 2011).
- Avi Sapkota, Ph.D., Department of Animal Science (Dec. 2012).

3. Graduate Students Receiving Degrees for Which Faculty Member Served as Major Advisor:


- **Padma Latha Bommireddy, M.S.**, Effect of irrigation regimes on crop phenology and arthropod populations in Texas, August 2004. Ph.D. from Louisiana State University. Currently a Field Crop Entomologist with Monsanto, St. Louis, MO.

- **Andy Marshal Cranmer, M.S.**, Influence of planting date and cotton cultivar on *Lygus* and fleahopper abundance in the Texas High Plains and the relationship between boll age and *Lygus hesperus* damage, August 2004. Currently a Farm Manager at Texas AgriLife Research farm, Halfway, TX.
• **Ram Babu Shrestha**, M.S., Ecology of arthropods in Texas High Plains cotton and development of sampling plans for selected cotton pests, August 2004. Also obtained a Ph.D. (Biology) with Dr. Parajulee (see below).

• **Anand Prasad Sapkota**, M.S., Population dynamics of *Aphis gossypii* in cotton: Laboratory studies and field validation, December 2004. Returned to his home country and is a Managing Director of a Private Consulting Firm.

• **Apurba K. Barman**, M.S., Lygus hesperus Knight in the Texas High Plains: Cotton compensation after fruit damage and host plant selection with implications for cotton IPM, December 2006. Currently a PhD student with Drs. Raul Medina and Megha Parajulee at Texas A&M University in College Station.


• **Chen Chen**, M.S., Life history parameters and population dynamics behavior of *Lygus hesperus* in selected hosts, June 2009. Continued PhD at Texas Tech University in Agricultural and Applied Economics.


• **Mahendra B. Adhikari**, M.S., Non-thesis option, May 2010. Currently managing a hotel enterprise in Lubbock, TX.

• **Abhilash Balachandran**, M.S., Residual toxicity and sublethal effects of insecticides on oviposition behavior of *Lygus hesperus* in cotton, May 2010. Currently a Biologist II-Discovery Biology, Dow AgroSciences, Indianapolis, IN.


• **Anup Bastola**, M.S., Arthropod community structures and convergent lady beetle intercrop movement behavior in adjacent cotton and alfalfa, May 2011.

• **Ram Babu Shrestha**, Ph.D., Ontogenic morphometry and genetic diversity of *Lygus hesperus* (Hemiptera: Miridae), May 2011. Currently a Research Associate at Texas A&M AgriLife Research and Extension Center.

• **Angela J. Fernando**, M.S., Investigation of the Cold Tolerance and Overwintering Behavior of *Lygus hesperus* (Hemiptera: Miridae), May 2011. Currently seeking a PhD program in Colombia.

• **Apurba K. Barman**, Ph.D., The interactive effect of geographic and host-plant species on genetic and phenotypic variation of cotton fleahopper populations, December, 2011. Currently a postdoctoral research associate at University of Georgia, Tifton, GA.
4. Graduate Students Receiving Degrees for Which Faculty Member Served as Committee Member:

- **Manoj Banjara, M.S.**, Expression of the *AtNHX1* gene in peanut to increase salt tolerance in peanut plants, August 2010. Currently a doctoral student at Texas Tech University Health Science Center, Amarillo, TX.

- **N. Ravi Kumar, Ph.D.**, Motion tracking of insects in image sequence, December 2008, National Institute of Technology, Tamilnadu, India.

- **K. Rajkumar, Ph.D.**, Study on polyphagous membracids in Thiruvallaur district in Tamil Nadu, May 2010, University of Madras, Chennai, India.

- **Samuel Tennyson, Ph.D.**, Studies on the mosquitocidal activity of *Ageratum houstonianum* Mill. (Asteraceae) against vector mosquitoes, December 2010, University of Madras, Chennai, India.


- **Stephanie Lockwood, Ph.D.**, Function and anti-microbial activity of poison sac proteins from queen red imported fire ants (*Formicidae: Solenopsis invicta*), December 2011 (TTU Biological Sciences). Currently a Postdoctoral Research/Teaching Associate at TTU Biological Sciences.

### Cumulative summary of graduate student advising (career total)

<table>
<thead>
<tr>
<th>Degree</th>
<th>Served as</th>
<th>Chair or Co-Chair</th>
<th>Committee Member</th>
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<tr>
<td>Ph.D.</td>
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<td>Total</td>
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5. Visiting Scientists Supervised:

- **Dr. Fajun Chen**, Associate Professor, Nanjing Agricultural University, Nanjing, China (January 2011-January 2012).

- **Dr. Feng Ge**, Professor and Director of Institute of Zoology, Chinese Academy of Sciences, Beijing, China, Visiting Scholar (January-February, 2003; July-October, 2003).

### Recognition of Teaching Activities

- Selected to serve on a Panel of the Delphi study (coordinated by Iowa State University, Ames, IA) to evaluate the success of the Higher Education Challenge Grant of the Cooperative State Research, Extension, and Education Services (CSREES), USDA., November 2005 to April 2006.

- Scholarly mentoring of graduate students resulted in the following scholarships/fellowships bestowed upon them:
  - Chancellor's Scholarship ($3,000) for P. Latha BommiReddy, 2002.
• Donald Ashdown Endowed Scholarship ($500) for P. Latha Bommireddy, 2003.
• West Texas Ag Chem Institute Scholarship ($1,000) for P. Latha Bommireddy, 2003.
• Harold and Mary Dregne Scholarship ($500) for Ram B. Shrestha, 2003.
• Donald Ashdown Endowed Scholarship ($500) for Ram B. Shrestha, 2003.
• West Texas Ag Chem Institute Scholarship ($1,000) for Ram B. Shrestha, 2003.
• West Texas Ag Chem Institute Scholarship ($750) for Andy M. Cranmer, 2003.
• West Texas Ag Chem Institute Scholarship ($750) for Bryan E. Henson, 2003.
• Harold and Mary Dregne Scholarship ($400) for Anand P. Sapkota, 2004.
• Donald Ashdown Endowed Scholarship ($400) for Anand P. Sapkota, 2004.
• West Texas Ag Chem Institute Scholarship ($1,500) for Anand P. Sapkota, 2004.
• P. Latha Bommireddy received 3rd place award for student paper oral competition at the Entomological Society of America Southwestern Branch Meeting, Lubbock, TX, 2004.
• Graduate School Travel Award ($450) for Apurba K. Barman, 2005.
• West Texas Ag Chem Institute Scholarship ($1,250) for Apurba K. Barman, 2005.
• Graduate School Travel Grant ($700) for R. B. Shrestha, 2006.
• Apurba Barman received 2nd place award for student paper oral competition at the Beltwide Cotton Conference, San Antonio, TX, 2006.
• Graduate School Travel Grant ($700) for R. B. Shrestha, 2007.
• Walter Albeidafo received $4,000 per year American Mexican Friendship—Waterman Scholarship, 2006-2007.
• Chen Chen and Abhilash Balachandran each received $500 departmental scholarship, 2007.
• Abhilash Balachandran received $1,000 departmental scholarship awards, 2008.
• Ram B. Shrestha received Graduate School and Departmental Travel Grants ($1,000), 2008.
• Mahendra Adhikari received Departmental Travel Grant ($700) and Leland Chandler Fellowship ($500), 2008.
• Teresa Cross, David Koepe Scholarship ($650), 2008.
• Ram B. Shrestha received 3rd place award for student paper oral competition at the ESA Branch meeting, Stillwater, OK, 2009.
• Ram B. Shrestha received Graduate School and Departmental Travel Grants ($1,000), 2009.
• Mahendra Adhikari received Departmental Travel Grant ($800) and TTU Departmental Merit Scholarship ($400), 2009.
• Anup Bastola received Departmental Travel Grant ($650) and Texas Association of Agricultural Consultants Scholarship ($900), 2009.
• Abhilash Balachandran received Departmental Travel Grant ($650) and Leland Chandler Fellowship ($600), 2009.
• Ram B. Shrestha received Graduate School Travel Grants ($1,200), 2010.
• Apurba Barman received travel grant from the Graduate School, Texas A&M University to attend Entomological Society of America Annual Meeting ($500), 2010.
• Apurba Barman received Lochner Scientific Presentation Travel Grants from College of Agriculture and Life Sciences, Texas A&M University to attend Ecological Society of America Annual meeting held in Pittsburgh, Pennsylvania ($500), 2010.
• Apurba Barman received Gary A. Herzog Ph.D. Student Award (2nd place) in Cotton Insect Research and Control Conferences at Beltwide Cotton Conferences held in Atlanta, Georgia ($250), 2011.
• Apurba Barman received Patricia Nemec Scholarship from College of Agriculture and Life Sciences, Texas A&M University ($500), 2011.
• Apurba Barman won the 2011 John Henry Comstock Student Award from the Entomological Society of America Southwestern Branch.

IV. Research

Program Statement

The mission of Texas AgriLife Research is “to conduct basic and applied research programs for the benefit of the consumers and agricultural industry; maintain and enhance the environment and natural resources; insure a safe, wholesome and affordable supply of agricultural products; and
contribute to the state's economic viability, especially in the rural areas.” Texas AgriLife Research-Lubbock is the largest of the 13 Experiment Stations of the Texas A&M University System, and was established in 1909 to serve the people of the Texas High Plains. Dr. Parajulee has been fortunate for the past 11 years at the Lubbock Center to help maintain and enhance a strong and effective program in Cotton Entomology that contributes to the Texas A&M AgriLife Research mission. He is dedicated to the goal of transcending clientele expectations and serving science and society through the tripartite mission of the land-grant university system.

Cotton is a major agricultural crop in the Texas High Plains, producing over 3,500,000 bales of cotton valued at over $1,000,000,000 per year. This represents an average of 30% of U.S. cotton and approximately 5% of world cotton; the primary reason for choosing Lubbock as the venue for the Fourth World Cotton Research Conference in 2007, for which Dr. Parajulee served as the Program Chair for the Cotton Arthropod section. Also, the Texas High Plains constitutes the most concentrated area of cotton production in the world. Because of the enormity of the cotton enterprise in the Texas High Plains, major allied agricultural industries (ginning, seed, fertilizer, and chemical companies) also reside in this area. Thus, even a small percentage of crop loss in the Texas High Plains due to insects and/or other pests renders a substantial economic impact on the entire cotton industry. The Texas High Plains annual loss attributable to arthropod pests ranged from 1 to 21%, causing an average loss of $101 million per year in the last 11 years.

Over the past three decades, much of the cotton insect pest management research done in Texas emphasized the ecology and management of the boll weevil. Now that the boll weevil has been largely removed as an economic pest from the system (except in the Lower Rio Grande Valley), the focus of arthropod management research has changed significantly. A potential shift in the insect pest complex has resulted from contributions from boll weevil eradication, new crop technologies (transgenic and high fiber yielding cultivars), safer pesticide chemistries, high-input cropping systems, and highly efficient irrigation systems (low energy precision application and sub-surface drip irrigation. Adoption of transgenic cotton cultivars conferring resistance to lepidopteran pests has increased from 5% in 2001 to 70% in 2012, reducing the insecticide load in cotton insect management even further. In addition, increased public concern for environmental safety and questions regarding sustainability of present crop protection practices has placed a premium on the development of integrated approaches to pest management. Often, the integration of these approaches has been hindered due to lack of understanding of the biology and ecology of target pests and a heavy reliance on insecticides. The Texas A&M AgriLife Research Cotton Entomology Program emphasizes the need for a greater understanding of the factors that enable the integration of different pest management approaches, with a broad objective of reducing unilateral reliance on chemical control and advancing the use of ecological methods. Thus, the scope of this research program is reflected in Dr. Parajulee’s Hatch Project “Developing Biologically and Ecologically Intensive Arthropod Management Strategies for Texas High Plains Cotton.”

Research Philosophy and Outcome

Dr. Parajulee’s research philosophy in the off-campus Experiment Station setting is that a strong research-extension partnership is vital. Based on this philosophy, he has forged a strong research-outreach partnership with his extension counterpart throughout his time in this position. The two programs (Research and Extension) are thus operationally merged into what is called Cotton Entomology Program to enhance the research-extension partnership and provide a synergism to both mission-oriented paradigms. This arrangement has allowed resource sharing (space, manpower, equipment, graduate students, research funds, and faculty time) to increase work efficiency, reduce redundancy, and help secure extramural funds. The joint program has allowed a smooth transition from more basic problem-solving research to grower adoption of translational research. Dr. Parajulee strongly believes in stakeholder participation while formulating
translational research projects, especially in the Experiment Station setting, to ensure the stakeholder “buy-in” of the research outcome. Recently, Dr. Parajulee’s appointment has changed from 25% teaching to 25% extension to reflect the regional need for his outreach service.

During the last 11 years, the Cotton Entomology Program has invested significant effort in elucidating the ecology and behavior of cotton arthropods with the aim of developing a systems approach to pest management. Recent progress toward this effort includes 1) a forecasting model to predict bollworm and tobacco budworm moth population dynamics based on long-term trap data (Parajulee et al. 2004), 2) cotton aphid population dynamics in cotton (Parajulee 2007), 3) the effect of cotton cultivar on cotton aphid growth and reproduction (Du et al. 2004), 4) Boll weevil survivorship during lint storage, module transport, and ginning (Sappington et al. 2004a,b,c,d; Sappington et al. 2006), 5) growth and development parameters for Lygus elisus in the laboratory (Bommireddy et al. 2004), 6) tri-trophic relationships in cotton, cotton aphid, and cotton aphid parasitoid (Chen et al. 2005), 7) sequential sampling plans for thrips and cotton fleahoppers (Parajulee et al. 2006a), 8) functional response models for selected arthropod predators from Texas cotton (Parajulee et al. 2006b), 9) effect of planting date, tillage, and cultivar on thrips and cotton fleahopper abundance (Parajulee et al. 2006c), 10) site-specific nitrogen and irrigation management approach in cotton production (Bronson et al. 2006), 11) Lygus species complex in relation to cotton and non-cotton host habitats in the Texas Plains (Slosser et al. 2006, Parajulee 2008), 12) characterization of microsatellite loci for L. hesperus (Shrestha et al. 2007), 13) cotton compensation ability after plant bug induced fruit loss (Parajulee and Barman 2008), and 14) host-plant influence on Lygus population growth and Lygus host preference (Chen and Parajulee 2010, Barman et al. 2010), and 15) host-plant study in cotton fleahoppers (Barman et al. 2012).

**Discovery Milestones and Impact of Research**

While significant contributions to the science of entomology/cotton entomology have been made through research publication and presentation, the following are some of the research projects during the last 11 years that have resulted in translational outcomes that Texas High Plains cotton producers have used in their production decision making (significant impact):

a) **Understanding Lygus population dynamics across the cropping landscape to elucidate the Lygus movement between cotton and non-cotton hosts.** While this is a long-term ongoing project, our producers now have a much better understanding of which alternate weed hosts can support Lygus and what triggers their movement to adjacent cotton. We have found that Lygus prefers roadside weed vegetation over adjacent cotton until cotton enters the peak flowering stage. Thus, insecticide intervention for early season Lygus management is unnecessary. Coupled with this Lygus behavioral attribute of early season cotton “avoidance” is the ability of cotton to tolerate/compensate for up to 30% of Lygus-induced early fruit loss. Our growers have already used this information and managed their cotton based upon our recommendations (per our producer survey, March 2009). Our survey indicated that 70% of farmers surveyed would not use insecticides to manage early season Lygus populations, with 18% saying they would rarely do so. The shift from complete reliance upon chemical insecticides irrespective of crop phenology, as recently as four to five years ago, to conscientious grower behavior and perceptions is a tremendous leap forward for integrated pest management and ecological sustainability. Dr. Parajulee takes the greatest pride in this technological adoption by our area growers. Overall insecticide use frequency for cotton insect management in the High Plains has declined by 71% during the last 5-6 years from that seen during the period 7-8 years prior to Dr. Parajulee’s leading the Cotton Entomology Program. While Dr. Parajulee does not assume full credit for this decline, or for other technological changes which occurred during this period, the impacts of the Cotton Entomology Program research on area cotton producers cannot be underestimated.
b) Biological information is now available to area IPM agents and crop consultants to design Lygus management plans. Cotton Entomology Program has developed host-plant sequencing describing the ecological succession of Texas High Plains Lygus development, which allows accurate prediction of a Lygus infestation in relation to a specific boll maturity threshold. This provides suitable insecticide application timing for Lygus control, and provides a specific time when termination of said application is recommended. Our producers now terminate late-season insecticide applications for Lygus management when the crop matures to 350 degree-days (>60 °F) beyond 5 nodes above white flower, in accordance with our recommendation. One farmer in our 2009 ‘grower feedback survey’ wrote “I think Megha is doing an excellent job researching cycles and habits of Lygus. His information helps make spraying decisions and helps know when to scout.”

c) Economic evaluation of the merits of sub-threshold effects of Bollgard technology on bollworm management economics. The Texas High Plains grower adoption rate of Bollgard cotton was 5% in 2001 when boll weevil eradication program had nearly eliminated the weevil as a pest from the system. In addition to the agronomic benefit of Bollgard technology, which, at the sub-threshold level, justifies its adoption in irrigated production systems, research has demonstrated increases in profitability exceeding $100.00/acre in Bollgard systems. The adoption rate now exceeds 70%.

d) Utilization of the integrated pest management approach in cotton has been enhanced through the availability of biological and ecological parameters of arthropod pests and natural enemies. All potential predatory arthropods from Texas High Plains cotton have been studied for their predation potential and their temperature range for effective predation have been described. Similarly, cotton aphid population dynamics has been studied in the laboratory in relation to temperature and crop phenology, and has been validated in the field.

e) Post-harvest dispersal of boll weevil has been extensively studied as part of a cooperative project between USDA-ARS and Texas AgriLife Research in light of the eradication program. Results of this study have been used by the Texas Department of Agriculture and the Texas Boll Weevil Eradication Foundation in addressing quarantine regulations designed to prevent re-infesting areas where the weevil has previously been eliminated.

Current Research Projects

The following list provides the diversity of research projects that are being conducted in the Cotton Entomology Program. Please note the diversity in disciplinary/programmatic areas as marked in bold text.

1. Quantifying the effect of soil applied nitrogen on cotton arthropod population dynamics in a drip irrigation system. Cropping system; system integration.

2. Ecology and behavior of Lygus species. Landscape ecology; cropping system; system integration.
   a) Varietal difference in COTMAN compensation capacity value in drip-irrigated cotton using Lygus-induced fruit damage.
   b) Boll susceptibility window for L. hesperus in Texas cotton.

3. Quantify the movement behavior of cotton fleahoppers in pre-flower cotton. Insect movement; immunological and behavior studies.


**Major Research Accomplishment** (see Section-X for specific evidence of accomplishment)

**Contributions to cotton entomology discipline**

Research Program has successfully balanced several multidisciplinary research projects simultaneously within the theme of ecologically intensive pest management program (see current research projects above). Research productivity is evidenced in all disciplinary areas of field crop entomology with numerous peer-reviewed papers, invited and submitted proceeding papers, and presentations at local, regional, national, and international level. Please refer to publication/presentation list below.

- Laboratory rearing/biology- This Program is the first to document temperature-dependent population dynamics behavior of cotton aphids in nutritionally standardized cotton plants. A successful life table analysis and population dynamics has also been published.

- Field population survey- Extensive survey program is ongoing in the Texas High Plains to characterize *Lygus hesperus* inter-crop movement behavior. A significant portion of the project effort is now invested in *Lygus* survey work. Several graduate students have earned degrees and have produced publications through this project.

- Sampling and threshold development- Sampling and threshold development is a cornerstone of the Cotton Entomology Program. Dispersion patterns, within-plant distribution behavior, and sequential sampling plans have been characterized for thrips and cotton fleahoppers. Continuing effort is underway to develop treatment thresholds for thrips and cotton fleahoppers.

- Pest manipulation- Compensation ability of cotton after *Lygus*-induced fruit loss has been extensively examined by manipulating pest population densities at different production scenarios. Several publications and Extension reports are made available for growers to use in making their *Lygus* management decisions.

- Host habitat manipulation- A successful optimization of internal, external and field marking of *Lygus* with protein markers and their detection by ELISA has been achieved. This technique has been used to study field ecology and behavior of *Lygus* in the Texas High Plains for the last four years. The intercrop movement behavior of *Lygus* has revealed that roadside alfalfa can serve as both source and sink for *Lygus* depending on the crop phenology. A significant accomplishment of this project to date is the identification of the major *Lygus* intercrop movement direction and window. We have demonstrated that *Lygus* bugs do not infest or cause significant damage to cotton until after active flowering. This knowledge has been useful in minimizing the *Lygus* population in cotton by proper management of adjacent alfalfa.

- Predator-prey population dynamics- Dr. Parajulee has a strong background in biological control through habitat diversification and natural enemy conservation. His Program
focuses on enhancing the role of natural enemies by delaying or avoiding early insecticide application. He has published several papers on natural enemy conservation in biological control and most recently had a graduate student that completed an M.S. degree in utilizing biofuel crop (Jatropha) and cotton as sink for whitefly in cassava and source for natural enemies, particularly the parasitoids.

- Insecticide chemistry- One graduate student is fully involved in developing LC$_{50}$ values of available chemistries for *Lygus hesperus*. He is also characterizing the effect of sublethal doses on insect behavior, reproduction, and population dynamics. Quantification of baseline resistance level in *Lygus* and bollworm from the High Plains is also underway. Lubbock Cotton Entomology Program is collaborating with Mississippi State University and several USDA laboratories and Cotton Incorporated to continue bollworm resistance monitoring program.

- Cropping systems management- Several projects have been completed and some are continuing to characterize the relationship between arthropod population dynamics and input use patterns, production practices, irrigation regime, fertility levels, and so on. Effect of planting date window, tillage, and cultivar on population dynamics of thrips and cotton fleahoppers has been already published. Variable nitrogen, nitrogen fertility rate, and cultivar x water level influence on cotton arthropods and crop growth are being investigated.

- Morphometry/taxonomy in pest management- A sophisticated morphometric approach has been developed to identify closely related species of *Lygus* adults and immature found in the Texas High Plains. This approach allows for an easy identification of the *Lygus* species with little knowledge of the insect taxonomy. The morphometric data are useful in development of the computer based automated species identification system. The morphometric information will be the baseline reference for morphometric phylogenetics and eco-morphometry research in future. Dr. Parajulee’s laboratory is the first one to publish comparative ontogenic morphometry data on two species of *Lygus*.

- Ecological genetics/molecular ecology in pest management- A microsatellite molecular marker system has been developed that is suitable for the population genetic study of *Lygus*. *Lygus hesperus* populations were found to be genetically differentiated within the Texas High Plains which has triggered research interests on biology and behavior of *Lygus* populations with different genetic structures. The Lubbock Cotton Entomology Program was the first to characterize and publish 11 microsatellite markers for *L. hesperus*. The regional level biogeography study of *L. hesperus* has been initiated and the information generated in this project will be useful in regional level *Lygus* management strategies.

**Contributions to industry or society**

Dr. Parajulee's research program has served its constituencies well at all levels as evidenced by his publication record, grantsmanship (see below on Grants and Contract section), graduate training, and invitation to public and professional speaking roles. Selected examples are listed below:

- Dr. Parajulee’s Cotton Entomology Program has earned a worldwide reputation in the areas of ecological approaches to pest management, particularly in *Lygus hesperus* and other plant bug management.

- At local level: Invited to serve High Plains Association of Crop Consultants (HPACC) on their annual program committee (2006-2008) and to lead the *Lygus*/plant bug issues in a roundtable forum and/or give invited talks in their annual conferences (2002-current).
At regional level: Invited to Entomological Society of America Pacific Branch symposium to deliver a keynote speech on “Compensation to Lygus-induced fruit loss in cotton: Effect of plant phenological stage” (March 28-April 2, 2008, Napa, CA).


At international level: Invited to deliver a keynote speech at the International Conference of Plant Protection, Dokki-Giza, Egypt, on “Ecologically intensive pest management in cotton: Lygus hesperus as a model system” (November 9-12, 2008). Also, invited as a plenary speaker at the International Congress of Global Warming on “Biodiversity of Insects: Management and Conservation”, Coimbatore, India (February 9-12, 2009).

**Involvement in associations, committees, and research efforts that show development of reputation beyond TAMUS and Texas**

- Elected Vice Chair (2007) and Chair (2008) of the International Affairs Committee of the Entomological Society of America. Secured ESA Program Enhancement Fund and organized a Program Symposium (competitive) in 2007; first time in the ESA history, Dr. Parajulee’s leadership (along with Rob Hollingsworth, USDA-ARS, Hawaii) brought South African scientists to present symposium talks via web. As a chair in 2008, he also secured a Program Symposium (with Program Enhancement Funds) along with Dr. James Harwood of University of Kentucky. Being selected for two Program Symposia, back-to-back, at the ESA national level should serve as a strong testament for Dr. Parajulee’s research program excellence and professional leadership. Served as ESA National Program Co-Chair in 2010.

- Established International Entomology Network as part of the ESA network and currently serves as a founding chair.

- Served on U.S. Organizing Committee of the World Cotton Research Conference that was held in Lubbock, Texas (2007); Program Chair for Arthropod Section.

- Selected to serve on Entomological Society of America Southwestern Branch Site Selection Committee (2007-2009) and Local Arrangement Chair/Meeting Organizer for the ESA Southwestern Branch annual meeting in Cancun, Mexico (2009-2010).

- Provided technical advice to Ghana Atomic Energy Commission’s Agriculture Program on whitefly management in cotton and cassava. USAID fellow, Mr. Ebenezer Ato Ewusie, worked in Dr. Parajulee’s laboratory as part of this pro bono consultancy service. June 2006-August 2008.


- Visited East Malling Research Laboratory in Kent, UK (Dr. Jerry Cross) and University of Kent in Canterburry, UK (Dr. David Hall) to discuss Lygus ecology research partnerships. June 7-12, 2007.

- Hosted a 6-member cotton research and extension delegation from Israel that visited Texas to learn cotton IPM practices. Also, held a roundtable conference of the delegates with Extension Entomologist David Kerns for a 3-h session. September 3 and 6, 2007.

- Hosted a 4-member cotton research team from India that visited Dr. Parajulee’s Program to learn ecological approaches to cotton pest management. September 17-18, 2007.
Hosted a 3-member cotton seed company team (Rasi Seeds India Ltd.) from India that visited Dr. Parajulee’s Program to learn US cotton systems. September 25, 2009.

V. Extension
Dr. Parajulee did not have a formal Extension appointment until September of this year. However, the off-campus research faculty positions come with a certain level of Extension role or expectations from its constituencies by its nature. Also, Dr. Parajulee’s program philosophy (i.e., strong research-extension partnership to serve the clientele as one Texas AgriLife unit rather than the service coming from AgriLife Research and AgriLife Extension separately) dictates that a visible outreach role becomes a part of his overall Program portfolio. Much of his Extension role is to support his counterpart in providing timely information to target clientele. Dr. Parajulee led both research and Extension activities in the summer of 2006 when the Texas AgriLife Extension entomology position was vacant. He worked with Extension faculty across multiple disciplines, IPM agents, producers, consultants, and industry representatives to transition the active Extension program until the new hire in January 2007. Again, his new Extension counterpart has resigned to take another position in April 2012 and Dr. Parajulee has agreed to serve on Extension role, in addition to his research role, until the new person is hired next year. In addition, Dr. Parajulee will have an official Extension role (25%) when a new Extension faculty member is hired.

Evidence of Extension accomplishment

- Outstanding Service Award for volunteer extension services to the Indian rural community of Himachal Pradesh, July 1987, Y. S. Parmar University of Horticulture and Forestry, Solan, India. Extension services included training rural peasants on agricultural resource utilization, woman and infant health, and women involvement in household decision-making.

- Letter of appreciation from Ms. Elner Pettiet, Secretary of Texas Women Involved in Farm Economics (Texas WIFE), for Dr. Parajulee’s presentation at their annual meeting on pest management and farm economics, July 10, 2003.

- Letter of recognition from Dr. Thomas W. Fuchs, Texas Extension IPM Coordinator (now retired), for Dr. Parajulee’s clientele-oriented IPM research program that has provided a significant help to growers with pest management decisions, September 29, 2004.

- Elected to Board of Directors of West Texas Agricultural Chemicals Institute, 2002-2006. Also, elected to serve as Chairman of the Scholarship Committee (2004-2006) that disbursed $8,000.00 per year on scholarships to students pursuing agricultural degrees in west Texas.

Extension presentations

- Parajulee, M. N. 2001. Overview of cotton entomology research in Lubbock. Entomology Science Conference/Insect Management Guide Revision, Texas A&M University, October 30, College Station, TX.


Parajulee, M. N. 2012. Management of *Lygus* in the Texas High Plains. HPACC annual meeting, March 5-6, Lubbock, TX.

**Field day presentations**

- Economic evaluation of arthropod management in conservation tillage system in cotton. Annual Field Day at the Agricultural Complex for Advanced Research and Extension System farm, Lamesa, TX. Gave 30-minute presentation to the participating cotton producers (50 attended); graduate student (R. B. Shrestha) and research scientist (Stanley Carroll) participated in the presentation. September 10, 2003.


- Attended Monsanto Extensive Cotton Experience Tour with producers and industry representatives and participated in grower discussion of pest management issues, Lubbock, TX, September 27, 2006.

- Four 10-minute field talks to the World Cotton Research Conference attendees at the TAES Helms farm tour on “Role of nitrogen fertility on arthropod management in drip irrigated cotton,” September 14, 2007.

- Cotton cropping system research: Insect management component. Ag-Cares Field Day and Grower Appreciation Meeting, August 12, 2009, Lamesa, TX. (10-minute field research demonstration talk).

• Three 10-minute field talks to the Lubbock Center Centennial Field Day participants at the Texas AgriLife farm tour on "100 years of insect research in the High Plains and a system approach to cotton production," September 17, 2009.

• Cotton cropping system research: Insect management component. Ag-Cares Field Day and Grower Appreciation Meeting, August 26, 2010, Lamesa, TX. (10-minute field research demonstration talk).

• Texas Organic Cotton Field Day, October 7, 2010, Lubbock, Hockley, Hale and Parmer counties, TX (all-day field tour of organic cotton production farms and discussion of pest management issues in organic production systems).

Other Extension activities


• Demonstration and lectures to public visiting the "Buggology" program at Science Spectrum, Lubbock, TX, throughout the day (500 people in attendance). Also, involved 4 graduate students to help the entomology-awareness public outreach program. March 6, 2004.

• Displayed a 3-day "Insect Booth" at the Lubbock Science Spectrum "Critterfest 2007" and gave live demonstration and lectures on insect feeding, growth and development, and insect management in field crops (5,700 people in attendance). Also, involved 6 graduate students to help the entomology-awareness public outreach program. June 15-17, 2007.

• Displayed a 3-day "Insect Booth" at the Lubbock Science Spectrum "Critterfest 2008" and gave live demonstration and lectures on insect feeding, growth and development, and insect management in field crops (6,000 people in attendance). Also, involved 6 graduate students to help the entomology-awareness public outreach program. June 27-29, 2008 (Invited for the re-run of the 2007 show).

• Displayed a 4-day "Insect Booth" at the Lubbock Science Spectrum "Critterfest 2009" and gave live demonstration and lectures on insect feeding, growth and development, and insect management in field crops (8,000 people in attendance). Also, involved 8 graduate students to help the entomology-awareness public outreach program. June 18-21, 2009 (invited).

• Displayed a 4-day "Insect Booth" at the Lubbock Science Spectrum "Critterfest 2011" and presented live demonstrations and lectures on insect feeding, growth and development, and insect management in field crops (9,000 people in attendance). This effort also involved 8-10 graduate students/staff to assist with this outreach program. June 23-26 (invited).

VI. Service/Engagement

Program Support Activities within the TAMU System:

1. Committee Assignments within the Department or Research & Extension Center:
   a. As Chair:
      • Entomology Science Conference Annual Program Committee, 2003.
Center Awards Committee, Texas AgriLife Research- Lubbock, 2004-current.


Search Advisory Committee for the Corpus Christi Field Crop Entomologist position, 2008-2009.


Search Advisory Committee for the Lubbock Center Texas AgriLife Extension Cotton Entomologist position, 2012-2013.

b. As Member:


IPM Committee, TTU Plant and Soil Science (PSS) Department, 2001-current.

Faculty Advisory Committee (Elected), TAMU Department of Entomology, 2003-2008.

Visioning Committee (Elected), TTU PSS Department, 2004-2006.

Recruitment and Retention Committee, TTU PSS Department, 2005-2006.

Search Advisory Committee for the Professor & Charles Parencia Chair in Cotton Entomology position, May 2005-2006.

Curriculum Development Committee, TTU PSS Department, 2006-2008.

Strategic Planning Committee, TTU PSS Department, 2007-2008.

Scholarship and Awards Committee, TTU PSS Department, 2008-2009.

Graduate Admission Committee, TAMU Entomology, 2007-current.

2. Committee Assignments within the College of Agriculture & Life Sciences (COALS):

As Member:

College of Agricultural Sciences and Natural Resources Committee on International Activities, Texas Tech University (2003-2007).

Search Advisory Committee for the Professor & Charles Parencia Chair in Cotton Entomology position. Served on this 4-member advisory team appointed by the Dean's Office, 2006-2008.

3. Committee Assignments within the Texas A&M AgriLife Research:

As Member:

Reduction in Force (RIF) Appeal Panel, 2003. It was an Experiment Station wide 3-member panel that was charged with the responsibility of conducting full hearings and providing recommendations related to appeals by Agency employees who were terminated due to RIF process.
• A six-member Texas A&M AgriLife Research Faculty Fellow/Senior Faculty Fellow selection panel, 2012-2013.

4. Committee Assignments within the Texas A&M AgriLife Extension Service:
   As Member:
   • Cotton Research Strategic Planning Committee, 2005. One-day workshop held in Lubbock on February 19; a strategic plan developed for the State.

5. Special Appointment at the University Level:
   • Texas Tech International Student Association Advisor (2006-2011).

Program Support Activities outside the TAMU System

1. International Assignments:
   • Lead Organizer, International Symposium on Climatic Data Based Pest Management, International Congress of Plant Protection, Beijing, China (May 2004).
   • Member, World Cotton Research Conference Organizing Committee (2005-2007). Also, Program Chair for the Cotton Arthropod Section.
   • Elected to the International Affairs Committee of the Entomological Society of America (2006-2012); Secretary (2006), Vice Chair (2007), and Chair (2008).
   • Organizer, International Symposium on Landscape Level management of Crop Pests, International IPM Symposium, Portland, OR (March 24-26, 2009).
   • Organizer, Ecology Symposium, 6th Asia-Pacific Congress of Entomology, Beijing, China (October 18-21, 2009).
   • Program Co-Chair, 7th International IPM Symposium, Memphis, TN (2009-12).
   • Organizer, International Symposium on Cultural Control in IPM, International Congress of Entomology, Daegu, South Korea (August 2012).

2. National Assignments:
   a. Professional/Scientific Societies:
      • ESA National Meeting Moderator for Section Cd, Baltimore, MD (December 16, 1992).
      • ESA Annual Meeting Moderator for the Student paper Competition, Ft. Lauderdale, FL (November 18, 2002).
• ESA Annual Meeting Student Paper Competition Head Judge, Cincinnati, OH (October 27, 2003).
• ESA Annual Meeting Student Paper Competition Head Judge, Salt Lake City, UT (November 15, 2004).
• ESA Annual Meeting Student Paper Competition Head Judge, Ft. Lauderdale, FL (December 15, 2005).
• Coordinator, Beltwide Cotton Conference Student Paper Competition, San Antonio, TX (January 5, 2006).
• ESA Annual Meeting Student Paper Competition presiding officer and moderator, Indianapolis, IN (December 11, 2006).
• Beltwide Cotton Conference Student Paper Competition Judge, New Orleans, LA (January 11, 2007).
• Symposium Organizer, National Integrated Pest Management Symposium, St. Louis, MO (April 4-6, 2006).
• Symposium Organizer, Southern Extension and Research Activities Information Exchange Group (SERA-IEG 23) Annual Symposium, Memphis, TN (October 31, 2006).
• Program Symposium Co-Organizer, ESA National Meeting, San Diego, CA (December 9-12, 2007).
• Program Symposium Co-Organizer, ESA National Meeting, Reno, NV (November 16-19, 2008).
• Program Symposium Co-organizer/Member Symposium Organizer, ESA National Meeting, San Diego, CA (December 12-16, 2010).

b. Governmental:
• Member, USDA-CSREES Grants Peer Review Panel, Washington, D.C. (April 24-26, 2007).
• Member, USDA-CSREES Grants Review Panel, Washington, D.C. (May 1, 2008; June 1, 2009; March 3, 2011).

3. Regional/State Level Assignments:
   a. Professional/Scientific Societies and Outside Universities:
   • ESA-SWB Annual Meeting Moderator, Corpus Christi, TX (February 11, 1998).
4. Local Level Assignments:
   
a. Professional/Scientific Societies:
   

b. Other:
   
   • Chair, Scholarship Committee, West Texas Agricultural Chemicals Institute, Lubbock, TX (2002-2005).
   

Consulting Activities/Professional Expert Service Rendered

1. International Level
   
   • Hosted a ministerial level Pakistani delegation that visited CA, NM, and TX to learn about the cotton ginning and storage processes. Presented a seminar to the delegation on “Effect of temperature on boll weevil survival in cotton module.” May 23, 2002.

• Whitefly management in cotton in Senegal. Group of agricultural scientists and government officials from Senegal visited Dr. Parajulee’s laboratory and he provided an overview of overall cotton IPM, including whitefly management. Summer, 2002.

• Cotton aphid research in controlled environment using clip cages, Chinese Academy of Sciences (CAS), Beijing, China. Visited CAS and helped a Ph.D. student Fajun Chen to set up his cotton aphid experiments. May 2004.

• Hosted a visiting Research Entomologist, Ms. Nora Jimenez, from Centro de Investigación Turipana, Colombia, for consultation and scientific exchange of ideas on cotton IPM research, with particular emphasis on cotton aphids and whitefly management. May 23, 2005.

• Provided technical advice to Ghana Atomic Energy Commission’s Agriculture Program on whitefly management in cotton and cassava. USAID fellow Mr. Ebenezer Ato Ewusie worked in Dr. Parajulee’s laboratory as part of this pro bono consultancy service. June 2006-August 2008.


• Hosted a 6-member cotton research and extension delegation from Israel that visited Texas to learn cotton IPM practices. Also, held aroundtable conference of the delegates with TCE Cotton Entomologist David Kerns for a 3-h session. September 3 and 6, 2007.

• Hosted a 4-member cotton research team from India that visited the Cotton Entomology Program to learn ecological approaches to cotton pest management. September 17-18, 2007. Took the Indian delegation to area cotton producer for a ½-day field tour.

• Participated in a ‘Field Crop IPM in Developing Countries’ roundtable workshop at the Indian Agricultural Research Institute, New Delhi, India, after presenting an invited seminar on cotton IPM in the United States. February 6, 2009.

• Hosted Julio Maldonado, a U.S. Embassy Cairo - Ag Attaché, for a 2-hour roundtable conference on cotton insect situation in the Texas High Plains and a laboratory tour. September 14, 2010.

• Hosted a ½-day Texas AgriLife Research Tour of the 69th International Cotton Advisory Committee Plenary delegates (70 delegates in four sessions) that visited the Cotton Entomology Program to learn ecological approaches to cotton pest management. September 21-25, 2010.

• Hosted Dr. Ponmuraj Jeyakumar, Senior Scientist (Entomology), Indian Council of Agricultural Research (ICAR), New Delhi, India in the laboratory and provided information on cotton integrated pest management, August 3-5, 2011.

• Hosted Dr. Konasale J. Anilkumar, Team Lead for Hemipteran Research, Monsanto World Headquarter, St. Louis, MO in the laboratory and provided information on Lygus rearing and cage study methodology, August 22-23, 2011.

• Hosted a 6-member Brazilian scientific delegation from the Foundation Mato Grosso, Rondonopolis, MT, Brazil in the laboratory for three days (August 24-26). The team consisted of two agronomists/scientists and four agronomy/crop production technical staff. My Program was chosen to lead the visit that included an overview of U.S. cotton production (planting, irrigation, fertility, pest, harvesting, and ginning) and field visits of
the cotton enterprises in the Texas High Plains. Team members were given a thorough overview of the Cotton Entomology Program and the Texas AgriLife Research Center overview, field visits, visit of the Fiber and Biopolymer Research Institute, and Plains Cotton Growers operation, August 24-26, 2011.

- Hosted Eddie Silman and James Ashley of Evonik Goldschmidt Corporation, Hopewell, VA in the laboratory and provided information on cotton insect pest management in the Texas High Plains and a field tour, June 14, 2012.

2. National Level

- Served on a panel of *Lygus* Research Experts for Monsanto Biotechnology Group, Memphis, TN (February 25-26, 2010).
- Served on a panel of *Lygus* Research Experts for Monsanto Biotechnology Group, Atlanta, GA (January 4, 2011); Orlando, FL (January 3, 2012).

3. State Level

- Served as an advisor to a select group of Texas cotton and corn producers in developing Bollgard cotton/corn refuge programs in consultation with Environmental Protection Agency and Monsanto Corporation, Amarillo, TX (2007).
- Provided 1-day training for Carrie Ann Deans of Texas A&M University Department of Entomology on *Lygus* rearing methodology, September 27, 2011.

4. Local Level

- Provided expert service to High Plains Agriculture Crop Consultants on plant bug management (2003-current). Serve as a subject matter expert on *Lygus* bug management panel annually or when sought by area consultants, growers, and IPM agents.

**Professional Development and Leadership Activities**

**A. Membership in professional/scientific societies**

1. International/National Level:

- Member, Entomological Society of America (1991-current); Sub-section Cd Secretary (2002), Vice-Chair (2003), and Chair (2004).
- Member, ESA-Southwestern Branch Awards Committee (1997-2001), Chair (1999).
- Member, ESA-Southwestern Branch Student Research Awards Committee (2001-2008).
- Member, International Organization for Biological Control of Noxious Animals and Plants (IOBC); Elected Member-At-Large (2004-2006).
- Member, Society of Southwestern Entomologists (1996-current); President (2009).
- Member, Entomological Society of America International Affairs Committee (2006-current); Secretary (2006), Vice Chair (2007), Chair (2008).
- Program Committee Member, ESA national meeting (2009-2011, Chair 2010).
- Program Co-Chair, International IPM Symposium (2009-2012).
- Program Committee Member and Awards Committee Co-Chair, International IPM Symposium (2012-2015).
2. Regional/State Level:
- Member, Southern Extension and Research Activities Information Exchange Group (2003-2010).

3. Local Level:
- Member, High Plains Association of Crop Consultants (2001-current).
- Member, Plains Cotton Advisory Group, Lubbock (2001-current).

B. Elected positions held in professional/scientific societies

1. International/National Level:
- Secretary (2002), Vice-Chair (2003), and Chair (2004), Entomological Society of America Sub-section Cd (Ecology and Behavior).
- President, Society of Southwestern Entomologists (2009).
- President, Institute of Rubber and Jatropha Research-Nepal (IRJR-N) (2010-current).

2. Regional/State Level:

3. Local Level:
- Board of Directors, West Texas Agricultural Chemicals Institute (Chair, Scholarship Committee), 2002-2006.

Editorial Positions Held in Professional/Scientific Societies

1. International/National Level:

Special Appointments to Positions of Leadership

1. Special Leadership Appointments at the National/International Level:
- Local Arrangements, ESA National Meeting, Dallas, TX (December 13-17, 1994).
- Presiding Officer, Beltwide Cotton Conferences, Atlanta, GA (January 11, 2002).
- ESA Annual Meeting Student Paper Competition Head Judge, Cincinnati, OH (October 27, 2003).
• Lead Organizer, International Symposium on Climatic Data Based Pest Management, International Congress of Plant Protection, Beijing, China (May 2004).


• ESA Annual Meeting Student Paper Competition Head Judge, Salt Lake City, UT (November 15, 2004).

• Presiding Officer, Beltwide Cotton Conferences, New Orleans, LA (January 7, 2005).

• ESA Annual Meeting Student Paper Competition Head Judge, Ft. Lauderdale, FL (December 15-18, 2005).

• Moderator, National Cotton Pest Management Seminar, Virginia Beach, VA (October 11, 2005).

• Coordinator, Beltwide Cotton Conferences Student Paper Competition, San Antonio, TX (January 5, 2006).

• Moderator, National Cotton Pest Management Seminar, San Destin, FL (October 12, 2006).

• Moderator, National Cotton Management Seminar, Puerto Vallarta, Mexico (October 6-9, 2008).

• Moderator, National Crop Management Seminar, Memphis, TN (October 31- November 2, 2006).

• Moderator, ESA Annual Meeting session, Indianapolis, IN (December 11, 2006).

• Judge, Beltwide Cotton Conferences Student Paper Competition, New Orleans, LA (January 11, 2007).

• Presiding Officer/Moderator, Beltwide Cotton Conferences Student Paper Competition, Nashville, TN (January 10, 2008).


• Program Committee, Entomological Society of America Annual Meeting (2009-2011, Program Chair, 2010). Organized and led the national meeting of the Entomological Society of America program, a 4-day annual meeting with 3,300 attendees and 2,400 scientific presentations. Organized a symposium on "Molecular and other novel tools in ecological research", a ½-day symposium at the annual meeting of the Entomological Society of America.

• Moderator, National Cotton Management Seminar, Point Clear, AL (October 5-8, 2009).

• Presiding Officer, Beltwide Cotton Conferences, New Orleans, LA (January 6, 2010).

• Panel, National Cotton Management Seminar, Savannah, GA (October 4-7, 2010).

• Program Co-Chair, International IPM Symposium (2009-2012).

2. Special Leadership Appointments at the Regional/State Level:

• Chair, Scholarship Committee, West Texas Agricultural Chemicals Institute (2004-2007).
• Program Chair, ESA-Southwestern Branch Meeting, Lubbock, TX (Feb. 23-26, 2004).
• Local Arrangement Chair, ESA Southwestern Branch Annual Meeting, Cancun, Mexico (2009-2010).

3. Special Leadership Appointments at the Local Level (to include ones within the TAMU System):

• Representative to the CSRS Review Panel of the Department of Entomology, University of Wisconsin-Madison (March 4-7, 1991).
• High Plains Association of Crop Consultants Annual Program Symposium Chair, Lubbock, TX (2004), Program Committee Advisor (2007, 2008).

Professional Improvement Activities

1. Participation in Meetings/Conferences of Scientific Societies and Other Professional Organizations:

   a. Societies and Organizations Whose Meetings Are Regularly Attended (~every year):

      1) National/International Societies/Organizations:
      • Entomological Society of America (every year)
      • Beltwide Cotton Conferences (every year)
      • Cotton Incorporated National COTMAN Workshop (every year)
      • National Cotton Pest Management Seminar (every year)
      • International Symposium on Lygus Plant Bugs (every 3-4 years)
      • International Congress of Entomology (every four years)
      • World Cotton Research Conference (every four years)

      2) Regional/State Level Societies/Organizations:
      • Entomological Society of America Southwestern Branch
      • Society of Southwestern Entomologists
      • Statewide Entomology Science Conference
      • West Texas Agricultural Chemicals Institute Annual Conference
      • Southern Extension and Research Activities - Information Exchange Group of Cotton Insects (SERA-IEG 23)
      • Texas State Support Committee Research Review

      3) Local Societies/Organizations:
      • High Plains Association of Crop Consultants
b. Other Societies and organizations Whose Meetings Were Only Attended Once:

1) National/International Societies/Organizations:
   - International Congress of Stored-Product Research, Canberra, Australia (1994).
   - International Plant Protection Congress, Beijing, China (2004).
   - International Conference of Plant Protection Institute, Giza, Egypt (2008).
   - International Congress of Climate Change on Biodiversity, Coimbatore, India (2009).
   - Asia-Pacific Congress of Entomology, Beijing, China (2009).

2) Regional/State Level Societies/Organizations:

2. Other Professional Improvement Activities:

a. Activities Related to the Improvement of Teaching/Instructional Skills:
   - Attended the workshop "Effective Teaching and Research Methodology in Agriculture" sponsored by the Utah State University, Logan, UT, May 15-27, 1988.
   - Attended the workshop "Enhancing the Student/Teacher Interaction: A Workshop on Teaching and Learning Styles" sponsored by the Center for Teaching Excellence, Texas A&M University, College Station, TX, November 4-5, 1994.

b. Activities Related to the Improvement of Research Skills:
   - Attended a 2-day workshop on cotton biotechnology (development of transgenic cultivar) at Monsanto World Headquarters, St. Louis, MO, June 24-26, 2002.
   - Visited Dr. Gordon Snodgrass Laboratory, USDA-ARS, Jamie Whitten Delta States Research Center Southern Insect Management Research Unit, Stoneville, MS for a 2-day training on Lygus rearing technique, dissection and quantification of diapause status, and insecticide bioassay on Lygus bugs. October 21-22, 2003.
   - Attended a 2-day workshop on "Cotton Management in the First 40 Days" sponsored by Bayer Crop Science, Dallas, TX, February 16-17, 2005.
   - Attended a 2-day training on "Molecular Techniques for Arthropod Monitoring" at Dr. James Hagler's Laboratory, USDA-ARS, Western Cotton Research Laboratory, Phoenix, AZ. Learned marking techniques for Lygus bugs using different proteins and detection of marked Lygus by direct and DAS-ELISA technique. March 17-18, 2005.
• Attended a 2-day workshop on “Precision Agriculture and Pest Management” sponsored by Cotton Incorporated, Austin, TX. November 15-16, 2005.

• Attended a 1-day workshop on “Use of COTMAN in Entomology Research” sponsored by Cotton Incorporated, Memphis, TN. October 31, 2006.

• Attended a 1-day workshop on “NSF Day: Enhancing the Grantmanship” sponsored by the National Science Foundation, El Paso, TX. January 22, 2008.

• COTMAN Plant Mapping Workshop, Arkansas Agricultural Experiment Station, Marianna, AR. May 15, 2009.

• COTMAN Plant Mapping Workshop, Texas AgriLife Research, Lubbock, TX, June 30, 2009. Workshop Organized by Dr. Parajulee.


c. Activities Related to the Improvement of Extension Service Skills:

• Annual Workshop of COTMAN Plant Mapping Research and Outreach Activities in the cottonbelt, Cotton Incorporated, Austin, TX. November 17-18, 2003.


• Annual Workshop of COTMAN Plant Mapping Research and Outreach Activities in the cottonbelt, Cotton Incorporated, Austin, TX. November 16-17, 2005.

• Monsanto Natural Refuge meeting to develop a new refuge plans for Texas. Meeting with Monsanto Technology Development Leadership, State Extension Specialists, and cotton stakeholders, College Station, TX (May 25, 2006).

• Annual Workshop of COTMAN Plant Mapping Research and Outreach Activities in the cottonbelt, Cotton Incorporated Crop Management Seminar, Memphis, TN. November 9-11, 2010.

• Annual Workshop of COTMAN Plant Mapping Research and Outreach Activities in the cottonbelt, Cotton Incorporated Crop Management Seminar, Orlando, FL. January 3, 2012.

d. Activities Related to the Improvement of Leadership Skills:

• Operationally merged the Texas AgriLife Cotton Insect Research (Dr. Parajulee) and Texas AgriLife Cotton Insect Extension (Dr. James Leser) projects into a Cotton Entomology Program (January 2004) to improve the research-extension partnership and provide synergy to both mission-oriented activities.

• Regular Project Leader Meeting, Texas AgriLife Research, Lubbock, TX. This meeting is called and moderated by the Resident Director of the Experiment Station to provide Project Leaders a “continuing education” on project and Texas AgriLife Research policy matters and involves the faculty on strategic planning, development of mission statements and project-specific impact statements, and the Science Roadmap.

e. Activities Related to the Improvement of Administrative Skills:

- Completed a training on “Creating a discrimination-free workplace” sponsored by Texas A&M University. September 1, 2004.
- Texas Tech University Plant and Soil Science Annual Faculty Retreats, Lubbock, TX. One-day retreats during late summer/early fall.

f. Activities Related to the Improvement of Other Professional Skills:

- Attended a 1-day educational workshop on Drip Irrigation. Texas Agricultural Experiment Station, Halfway, TX. September 11, 2001.
- Attended Stoneville Seed Company sponsored (invited) information exchange meeting that highlighted the role of cooperation between research scientists, extension specialists, crop consultants, and seed industry representatives, Lubbock, TX. February 12, 2002.
- Attended FMC Corporation sponsored (invited) information exchange meeting that highlighted the role of cooperation among research scientists, extension specialists, crop consultants, and pesticide industry, Lubbock, TX. April 5, 2002.
- Attended Monsanto/Stoneville sponsored (invited) information exchange meeting with extension specialists and crop consultants, Lubbock, TX. March 24, 2005.
- Attended Delta and Pine Land sponsored information exchange field day to educate crop consultants, Lubbock, TX. September 13, 2005.
- Attended Monsanto/Stoneville sponsored (invited) information exchange meeting with extension specialists and crop consultants, Lubbock, TX. September 24, 2006.
- Attended Bayer CropScience sponsored FiberMax information exchange field day to educate crop consultants, Lubbock, TX. September 27, 2007.
- Attended Monsanto sponsored (invited) information exchange meeting with extension specialists and crop consultants, Ruidoso, NM. March 1-4, 2007.

• Attended Bayer CropScience Technology Conference (invited), San Antonio, TX. February 6-9, 2007.

• Attended Bayer CropScience Technology Conference (invited), San Antonio, TX. February 6-8, 2008.

• Attended Monsanto sponsored (invited) information exchange meeting with extension specialists and crop consultants, Ruidoso, NM. March 6-8, 2008.

• Attended West Texas Ag Chemicals Institute Conference, Lubbock. September 10, 2008.

• Attended Monsanto sponsored (invited) information exchange meeting with extension specialists and crop consultants, San Antonio, TX. January 5-6, 2009.

• Attended Monsanto sponsored (invited) information exchange meeting with extension specialists and crop consultants, Santa Fe, NM. January 27-29, 2010.

• Attended Bayer CropScience Technology Conference (invited), San Antonio, TX. February 17-19, 2010.

• Attended Monsanto sponsored information exchange meeting (invited) with extension specialists and crop consultants, Santa Fe, NM. February 9-11, 2011.

• Attended Bayer CropScience Technology Conference (invited), San Antonio, TX. February 18-20, 2011.

• Attended Dow AgroSciences & PhytoGen Field Day (invited), Lubbock, TX. September 23, 2011.

• Accepted to attend Monsanto information exchange meeting (invited) with extension specialists and crop consultants, Santa Fe, NM. February 8-10, 2012.

• Accepted to attend Bayer CropScience Technology Conference (invited), San Antonio, TX. February 13-15, 2012.

VII. International

Major international involvement

• Recruitment and training of international graduate students from Nepal, India, Mexico, China, and Ghana.

• Collaborative linkage with Chinese Academy of Science, Beijing, China (2003-current), and Nanjing University (2006-current) in the areas of enhanced CO₂ affecting arthropod population dynamics in cotton.

• Collaborative linkage with Ghana Atomic Energy Commission’s Biotechnology and Nuclear Agriculture Research Institute through USAID program (2006-2010).

• Organizing international congress symposia, invited keynote and plenary speeches, and international consulting services (pro bono, professional) are integral part of the Program overall mission as evidenced from activities already listed above in other sections.
• Founding Chair and Patron, Nepal Overseas Entomologists (2007-current).
• Invited to serve as the External Examiner for a doctoral thesis “Motion Tracking of Insects in Image Sequence by N. Ravi Kumar at National Institute of Technology, Tamilnadu, India (2008).
• Invited to serve as the External Examiner and committee member for a doctoral thesis “Study on Polyphagous Membracids in Thiruvallaur District in Tamil Nadu” by K. Rajkumar at University of Madras, Chennai, India (2009-2010).
• Invited to serve as the External Examiner and committee member for a doctoral thesis “Studies on the mosquitocidal activity of Ageratum houstonianum Mill. (Asteraceae) against vector mosquitoes” by Samuel Tennyson at University of Madras, Chennai, India (2010-2011).
• Lygus Research Expert/Consulting, Monsanto Biotechnology Group (USA and India focus) (2009-current).
• President, Institute of Rubber and Jatropha Research-Nepal, IRJR-N (newly formed INGO (international non-governmental organization) focusing on industrial/cash crop research) (2010-current).
• Cotton Entomology Program chosen for Dr. Fajun Chen of Nanjing Agricultural University for 1-year Chinese Government visiting fellowship (2011-2012).

VIII. Grants and Contracts Secured

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<td>$6,612,438</td>
<td>$2,455,196</td>
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Grants and Contracts

Internal (* indicates non-competitive)


• Parajulee, M. N. Procurement of specialized instrument for molecular research in cotton entomology. Texas Agricultural Experiment Station. 2005. Funded: $9,000.


- Parajulee, M. N., R. F. Medina, C. G. Sansone, and C. P. Suh. INSECTeam funds to develop a cooperative research program between College Station and off-campus research Center in Insect Ecology. 2006. Funded: $2,500.
- Parajulee, M. N., S. Behemer, and J. S. Armstrong. INSECTeam funds to develop a cooperative research program between College Station and off-campus research Center in Insect Physiology. 2006. Funded: $2,500.
- *Parajulee, M. N. Supplemental funding from TAMU federal funds to compensate TTU/USDA funding through International Cotton Research Center. Texas Agricultural Experiment Station. 2007. Funded: $8,461.
- Nansen, C. and M. N. Parajulee. Procurement of specialized instrument for chemical ecology research in entomology. Texas Agricultural Experiment Station. 2007. Funded: $18,000 (Account Manager of $0, but the funding was shared and matched to purchase the GC-MS).

External funding (* indicates non-competitive)


- Parajulee, M. N. (PI). Quantifying the natural enemy profile and developing a decision rule system for predators in cotton agroecosystems. Texas Department of Agriculture. 2002. Funded: $10,000.


• *Parajulee, M. N. (PI) and J. F. Leser. Quantifying the tolerance level of Bollgard II cotton to cotton bollworm pressure. Monsanto Company, Memphis, TN. 2005. Funded: $5,000.


• *Parajulee, M. N. (PI). Evaluating the economics of Bollgard II®/Roundup Ready Flex cotton versus Roundup Ready Flex only cotton under simulated commercial production conditions. Monsanto Company. 2006. Funded: $5,000.

• Parajulee, M. N. (PI) and R. K. Boman. Quantifying cotton compensation ability to *Lygus*-induced fruit loss under a high input drip irrigation system. USDA-ARS CSREES Competitive Grants Program through International Cotton Research Center. 2006. Funded: $41,000.


IX. Publications and Professional Output

Summary of Publications and Scholarly Work

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<th>Publication Type</th>
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<td>Extension Publications</td>
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<td>Popular Articles/Interviews</td>
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Publication list

Refereed journal articles


**Refereed Proceeding Papers**


**Book chapters**


Scientific Abstracts


Papers in Non-Refereed Proceedings


Experiment Station Research Reports


**Technical Reports**


**Grants or Contracts Reports**


**Extension Publications**


**Popular articles/interviews on Dr. Parajulee's work**


5. Tiny fleahoppers can cause big problems: Early-season pressure from fleahoppers can take a bite out of final yields. Cotton Grower Magazine, p. 4-6, May 2005.


12. 100 years and counting as ag research continues. Southwest Farm Press, October 19, 2009.


**Summary of Scientific and Professional Presentations**

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**Invited Presentations**

**International**


17. **Parajulee, M. N.** 2009. Ecologically intensive pest management in cotton agroecosystems: *Lygus hesperus* as a model system. Indian Agricultural Research Institute, February 6, New Delhi, India.

18. **Parajulee, M. N.** 2009. Landscape level understanding of *Lygus hesperus* host preference and host utilization affecting *Lygus* management in cotton. 6th International IPM Conference, March 24-26, Portland, OR (Organized an Invited Symposium; Program Enhancement Funds were also awarded).


National

1. Parajulee, M. N. 1993. Biology and predatory potential of Lycocoris campestris. A special seminar given to the “People’s Republic of China Team-7: Application of Predatory Insects in Grain Storage Management” at USDA-ARS Laboratory, June 28, Madison, WI.


3. Parajulee, M. N. 1996. Life history, predatory biology, and population ecology of Lycocoris campestris (Hemiptera: Anthocoridae). Department of Entomology, Oklahoma State University, June 24, Stillwater, OK.


7. Parajulee, M. N. 1999. Bridging the gap between research and clientele: Role of extension in integrated pest management programs. Department of Entomology, North Dakota State University, May 4, Fargo, ND.


22. Parajulee, M. N. 2007. Connecting to the world: Should ESA have an International Branch? Entomological Society of America Program Symposium, December 8-13, San Diego, CA (Organized the Program Symposium; Program Enhancement Funds were also awarded).

23. Parajulee, M. N. 2008. Connecting to the world: Should ESA have an International Branch? Entomological Society of America Program Symposium, November 16-19, Reno, NV (Organized the Program Symposium; Program Enhancement Funds were also awarded).


39. Parajulee, M. N. 2012. Opportunities and challenges for collaborative research between the United States and Nepal. Entomological Society of America Member Symposium, November 11-14, Knoxville, TN.
1. Parajulee, M. N. 2001. Overview of cotton entomology research in Lubbock. Entomology Science Conference, October 29-November 1, College Station, TX.


29. Parajulee, M. N. 2010. Cotton Entomology Research Program in the High Plains: Program overview and potential areas of collaboration. Entomology Science Conference, Nov. 4-7, College Station, TX.


Submitted Presentations

International


National


Regional/State Level


3. Parajulee, M. N. 2002. Overview of cotton entomology research in Lubbock. Entomology Science Conference, October 29-November 1, College Station, TX.


7. Parajulee, M. N. 2003. Update on Lygus research in the Texas High Plains. Entomology Science Conference, October 29-November 1, College Station, TX.


32. Kerns, D., M. Muegge, and M. Parajulee. 2010. Development of a binomial sampling plan to estimate thrips populations in cotton to aid in IPM decision making. Entomological Society of America Southwestern Branch annual meeting, April 11-14, Cancun, Mexico.


38. Chen, F., and M. N. Parajulee. 2011. Specific responses of three key species of rice planthoppers to elevated CO$_2$ and temperature. Entomological Society of America Southwestern Branch annual meeting, March 7-11, Amarillo, TX.


**X. Professional Honors and Awards**

1. For Distinguished Teaching/Instruction:
   - Selected to serve as a Science Education Fellow (SEF) mentor at the Howard Hughes Medical Institute's Center for the Integration of Science Education and Research, 2003. Selection to SEF mentorship is the recognition of teaching excellence at Texas Tech University.

2. For Distinguished Research Accomplishments and Contributions:
   - **Vice Chancellor's Award in Research Excellence (Off-Campus)** (2008), Texas A&M University, College Station, Texas.
   - **Plenary Speaker Recognition at the International Congress of Biodiversity** (2009), Bharathiar University, Coimbatore, India.
- *Texas AgriLife Research Faculty Fellow* (2009), Texas A&M University, College Station, Texas.
- *Texas A&M Regents Fellow* (2011), Texas A&M University System Board of Regents. This is the highest faculty award for Texas A&M University System.

3. For Distinguished Extension and Service Accomplishments and Contributions:

- *Outstanding Service Award* for volunteer extension services to the Indian rural community of Himachal Pradesh, July 1987, Y. S. Parmar University of Horticulture and Forestry, Solan, India. Extension services included training rural peasants on agricultural resource utilization, woman and infant health, and women involvement in household decision-making.
- *Recognition of Exceptional Service as ESA National Program Co-Chair* (2010), Entomological Society of America, Lanham, MD.
- *Recognition of Exceptional Service as President* (2010), Society of Southwestern Entomologists Executive Committee, Dallas, TX.
- *Jewel of Nation Award* (2011), Everest Foundation, Kathmandu, Nepal. This award recognizes the professional success and international service/outreach by Nepalese expatriates or by foreign citizens in Nepal.

************************************************************************************
Maureen Qualia  
PO Box 703, Fredericksburg, Texas 78624  
Cell: 559.312.7097  
amaureen_qualia@yahoo.com

EDUCATION

California State University, Fresno, CA  
**M.S. Enology**  
Thesis: *The Evolution of Phenolic Compounds in Red Wine during Post-Fermentation Maturation; Correlation with Perceived Astringency and Bitterness*  

University of Texas, Austin, TX  
**B.S. Nutrition**  

TEACHING EXPERIENCE

Texas Tech University, Fredericksburg, TX  
**Instructor of Enology  Aug 2013- Present**  
Developing and teaching courses for the academic and non-academic enology tracks for the Department of Plant and Soil Sciences.  
Courses being developed: Wine Analysis, Wines of the World, Winery Management

University of California, Fresno, CA  
**Graduate teaching assistant  2006-2007**  
Prepared wine analysis lab. Assisted in teaching and grading of reports.

RELATED EXPERIENCE

J&J Cellars, Paso Robles, CA  
**Winemaker  2010-2013**  
Managed all aspects of wine production from grape to bottle.

Trione Vineyards and Winery, Geyserville, CA  
**Assistant Winemaker  2009-2010**

Owl Ridge Wine Services, Sebastopol, CA  
**Lab and Cellar Tech  2008**

Silver Oak Winery, Healdsburg, CA  
**Phenolic Researcher  2007**
LANGUAGES
English- native language
Spanish- speak, read, and write with basic competence

PROFESSIONAL MEMBERSHIPS
American Society of Enology and Viticulture
Texas Wine and Grape Growers Association
Women for WineSense, Texas Hill Country Chapter
CURRICULUM VITA

THOMAS L. THOMPSON

Department of Crop and Soil Environmental Sciences (MC 0404)
Virginia Tech, 185 Ag Quad Ln. (330 Smyth Hall)
Blacksburg, VA 24061
Phone (540) 231-9775, FAX (540) 3431, email: thomas.thompson@vt.edu

EMPLOYMENT

2011 – present  Professor and Department Head, Crop and Soil Environmental Sciences, Virginia Tech
2010 – 2011 Coordinator, “Project Revolution”, Collaborative Research venture with Bayer CropScience (total funding of $10 million)
2008 – 2011 J.A. Love Endowed Chair
2006 – 2011 Professor and Department Chair, Department of Plant and Soil Science, Texas Tech University
2003 – 2006 Professor and Extension Specialist, Department of Soil, Water, and Environmental Science, University of Arizona
1997 – 2003 Associate Professor and Extension Specialist, Department of Soil, Water, and Environmental Science, University of Arizona
1991 – 1997 Assistant Professor, Department of Soil, Water, and Environmental Science, University of Arizona

EDUCATION

Ph.D. 1991 Soil Chemistry, Iowa State University
M.S. 1987 Soil Chemistry and Fertility, Texas A&M University
B.S. 1985 Agronomy, Abilene Christian University, Abilene, Texas

SELECTED HONORS, AWARDS, AND OFFICES HELD

Awards:
1. Teaching Award of Merit, National Assoc. of Colleges and Teachers of Agriculture, 1994
2. Election to Gamma Sigma Delta, The Honor Society of Agriculture, 1994
3. Outstanding Junior Faculty Member, Gamma Sigma Delta, 1994
4. Fellow, American Society of Agronomy, 2010
5. Fellow, Soil Science Society of America, 2010

Offices:
1. Secretary-Treasurer, Western Society of Soil Science, 1996
5. Chair and Local Events Chair, CSREES Regional Planning Committee WERA-103 “Nutrient Management and Water Quality”, 2003-2004
8. Division Chair, S08 (Nutrient Management and Soil and Plant Analysis), Soil Science Society of America, 2008-09.

PROFESSIONAL SOCIETIES

American Society of Agronomy
Soil Science Society of America
American Society for the Advancement of Science

PROFESSIONAL SERVICE

1. Member, Soil Science Society of America Committee S480, Soil Science Education Award, 1991-94
2. Chair, Soil Science Society of America Committee S480, Soil Science Education Award, 1994
4. Member, SSSA Advocacy/Education Task Force, 2008 - present
5. Member, SSSA Committee S111.08, Nominations Committee for Div. S-8 Officers, 2008 - present
6. ASA/CSSA/SSSA Committee ACS 731, Location of meetings, 2008.
7. Panel Member, Adoption of Precision Technologies, Special Competitive Grants Program, USDA-CSREES, Initiative for Future Agricultural and Food Systems, Washington, DC, 2000
10. Member, Visiting Committee, Department of Agriculture and Environment, Abilene Christian University, 2009 – present.
11. International invited lectures in Brazil, China, Israel, Oman.

PROFESSIONAL IMPROVEMENT

1. Sabbatical leave, Visiting Professor, Faculty of Agriculture, Hebrew University of Jerusalem, and Ben-Gurion University of the Negev, Israel. 2004.

TEACHING


PUBLICATIONS

Refereed:


Book Chapter:

Extension Bulletins:

Abstracts, Proceedings, and Reports ( >75 )

RESEARCH FUNDING

PI or Co-PI on >30 competitive grants, $4.5 million (approx.)
Career Vita

DEPARTMENT OF PLANT AND SOIL SCIENCE
TEXAS TECH UNIVERSITY
LUBBOCK, TX 79409-2122
CURRICULUM VITAE

Harlan G. Thorvilson
Professor of Entomology

Education:
Ph.D. Iowa State University. 1984. Entomology.

Professional Experience:
Professor of Entomology. Texas Tech University. 1997 to present.
Associate Professor of Entomology. Texas Tech University. 1990-97.
Assistant Professor of Entomology. Texas Tech University. 1984-90.
Predoctoral Associate (Extension). Iowa State University. 1980-83.
Instructor, Assistant, and Associate Professor. Waldorf College, Forest City, IA. 1969-80.

Professional and Honorary Societies:
American Registry of Professional Entomologists
Entomological Society of America
Southwestern Branch—Entomological Society of America
Society of Southwestern Entomologists
Gamma Sigma Delta Honor Society of Agriculture
Iowa Academy of Science
Phi Kappa Phi
Sigma Xi
South Carolina Entomological Society
Southwestern Entomological Society
Texas Pest Control Association
West Texas Agricultural Chemicals Institute

Honors and Awards:
Honors:
Texas Tech University Teaching Academy. Charter Member. 1997 to present.
Awards:
3. President's Excellence in Teaching Award. Texas Tech University. 1996.

Presented at the 2003 National Entomological Society of America meetings, October 26-29, 2003, Cincinnati, OH>

Principal Research Interests:
Biology and ecology of the red imported fire ant (Solenopsis invicta Buren). Entomopathogenic fungi as agents of insect biological control. Protecting electrical equipment from fire ant damage.

Patents:
Pending:

Refereed Publications (Career Total of 46):


44. Johnson, Amy, Brad Dabbert, Rob Mitchell, and Harlan Thorvilson. 2008. Integrating prescribed burning and insecticide to red imported fire ant impacts on northern bobwhite chicks. (poster presentation)


**In Review by Journal:**


**In Preparation:**


Technical Publications/Popular Articles (Career Total of 4):


Abstracts and Proceedings (Career Total of 77++):


EDIT—MANY MORE SINCE 2000

Seminars and Presentations:


104. Thorvilson, H. Fire ant research at Texas Tech. Graduate Seminar (PSS 5100), Dept. of Plant and Soil Science, Texas Tech University, spring semester 2001


112. **Principal Subject Matter for Teaching:** Entomology.

  - Introductory Entomology
  - Insect Taxonomy
  - Agricultural Compounds
  - Pesticides
  - Field Crop Entomology
  - Medical and Veterinary Entomology
  - Horticultural and Urban Entomology
  - Integrated Pest Management

**Formal Courses Taught Last Five Years:**

  Thorvilson CV (working copy to 2000)
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Graduate Courses

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<th>Number of Students</th>
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<tbody>
<tr>
<td>PSS 5001</td>
<td>Field Crop Entomology</td>
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<tr>
<td>SS 5001:</td>
<td>Problems</td>
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<tr>
<td>PSS 5304:</td>
<td>Economic Entomology</td>
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<td>PSS 5307:</td>
<td>Pesticides</td>
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<tr>
<td>PSS 5401:</td>
<td>Advanced Insect Taxonomy</td>
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<tr>
<td>PSS 6000:</td>
<td>M.S. Thesis</td>
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<tr>
<td>PSS 6001:</td>
<td>Problems</td>
<td></td>
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<tr>
<td>PSS 7000:</td>
<td>Research</td>
<td></td>
</tr>
</tbody>
</table>

Workshops (Organized/Conducted):


Graduate Students Directed (Career Total of 16):

M.S. (Total of 14)


Non-Thesis (Total of 2)


Graduate Students in Progress:
M.S.

Ph.D.

Graduate Committees:
M.S.


Ph.D.


Ed.D.

Non-Thesis

External Support: Career Total -- $3,271,948


Continuing Educational Development Funding:
1. Thorvilson, H. G. 1993. Conferred with insect pathologist and mycologist, Dr. Richard Humber, and other researchers involved with entomopathogenic fungi as biocontrol agents for insect pest populations for two weeks at the Plant Nutrition Laboratory, USDA-ARS, Cornell University, Ithaca, NY. Toured the Smithsonian Institution Natural History Museum for three days in Washington, DC. Developmental Leave. $2,000. Funded.

Service: Edit since 2000
A. University Committees and Service:
   Texas Tech University.
   1. Faculty Grievance Hearing Committee. 1994-96.
   2. Faculty Screening Committee for CASNR. Plant and Soil Science Representative. 2000.
   4. Fire Ant Research and Education Management Committee.
      a. Review University research programs; Texas Legislative funding accounts; and cooperate in studies among Texas Tech University,
Texas A&M University, University of Texas, Texas Department of Agriculture, Texas Parks and Wildlife, etc. 1997.


   b. Secretary/Treasurer. 1990-93.

7. Graduate Faculty. 1984 to present.

8. Institute for Biotechnology. 1998 to present.

9. Institute for Environmental Studies. 1994 to present.

10. Safety Committee. College of Agriculture and Natural Resources Representative. 1986-95.

11. Search Committee for Assistant/Associate Professor of Cotton Entomology at Lubbock Research and Extension Center. Member. 2000 to present.

12. Sigma Xi. 1983 to present.


15. Tenure Hearing Panel. College of Agricultural Sciences and Natural Resources Representative. 1993 to present.

B. College Committees and Service: Edit since 2000

College of Agricultural Science and Natural Resources.

1. College Scholarship Committee. 1995 to present.

2. Commencement Committee. 1990 to present.


5. Development Committee. 1985-86.


12. Texas Fire Ant Research and Management Initiative Committee (FARMIC). 1997 to present.


C. Departmental Committees and Service:
Department of Plant and Soil Science.


3. Donald Ashdown Entomology Club.
   a. Advisor. 1988 to present.
   b. Ag Olympics Coach. 1994 to present.

4. Faculty Development and Budget Recommendation Committee. 1997 to present.

5. Graduate Student Recruitment Committee. 1991-95.


8. Integrated Pest Management Committee. 1995 to present.


13. Scholarship Administrator.
   d. Texas Pest Control Association's Riley Turner Scholarship. 1994 to present.


15. Texas Pest Control Association

16. Undergraduate Program Committee. 1995 to present.

D. Professional Society Service:

American Registry of Professional Entomologists. 1984-94.
1. West Texas-New Mexico Chapter.
   b. Vice-President. 1990.

2. West Texas-New Mexico Chapter of Board Certified Entomologists.
   a. Secretary/Treasurer. 1992-94.

Entomological Society of America. 1978 to present.

2. Education and Youth Committee. 1998 to present.


Entomological Society of America, Southwestern Branch. 1979 to present.
1. Awards Committee. 1996 to present.

2. Linnaean Games Committee. 1994 to present.


4. Program Chair, 1987-88.


Southwestern Entomological Society. 2001.
South Carolina Entomological Society. 2001.

Texas Pest Control Association. 1985 to present.
1. Honorary Member. 1992 to present.
   a. Coordinator. 1985 to present.
   b. Co-Chair. 1985 to present.
   c. Organization Committee. Co-Chair. 1985 to present.
   Texas Tech University. Administrator. 1986 to present.

West Texas Agricultural Chemical Institute. 1986-94.

E. Professional / Industry Service:
1. 5th International Pest Ant Symposia. Organizing Committee.
   San Antonio TX. May 1, 1995.
4. Media
   a. 10 April 2000. Interview about fire ants by University Daily.
   b. 12 April 2000. Film and interview about fire ants by KLBK- TV,
      Lubbock.
   c. 14 April 2000. Phone interview with the Texas State Radio Network,
      KRLB, Dallas, about fungi and fire ants. (Rick Wais (1-800-683-5558).
   d. 18 April 2000. Channel 11, Lubbock, television interview.
   f. 2 May 2000. The News of Texas, Susan Risoon and Neftali Gonzalez,
      video interview.
5. Research Proposal Reviewer.
6. Texas Department of Agriculture.

8. Texas Structural Pest Control Board Committee on Continuing Education. 1989 to present.
   a. Exam Committee. 1997 to present.
      1) Lawn, Ornamental, and Weed Control Exams Subcommittee.


F. Community Service:
   a. Vice President. 1997 to present.

2. Elementary School presentations in Lubbock, Cooper, and Shallowater public school districts. 1986 to present.

3. Gloria Dei Lutheran Church.
   c. Executive Committee. 1995 to present.
   d. Sunday School Teacher. 1997 to present.
   e. Treasurer. 1996-97.


5. Lubbock Association for Gifted and Talented Children.


G. Administrative Duties:
For Internal Use Only

Items listed below have been removed from the regular vita format but are kept here to be convenient for annual and future reports.

**Note:** PSS format **does not** list the items which appear in Abstracts and Proceedings as duplicates under the Seminars and Presentations section. The duplicate information contained below is for use in the annual report.

Seminars and Presentations:


Graduate Committees -- Students Who Did Not Complete Program:

M.S.


Ph.D.
1. Foncham, Samuel. Ph.D. Candidate. Department of Plant and Soil Science. Texas Tech University. (Withdrew from program.)

External Support—Not Funded:


**Additional Funding Information:**

**Institutional Research Support** (Does not include Research Salary Release):

**Red Imported Fire Ant**


**Total $164,107**
**Research Support** (Does not include Research Salary Release):  

**Viticulture and Enology**

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Title</th>
<th>Line Item</th>
<th>Amount</th>
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<tr>
<td>1984</td>
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<td>1986</td>
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<td>Viticulture and Enology</td>
<td>Line Item</td>
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<td>Line Item</td>
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<tr>
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<td>Viticulture and Enology</td>
<td>Line Item</td>
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<td>1990</td>
<td>Thorvilson</td>
<td>Viticulture and Enology</td>
<td>Line Item</td>
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</table>

**Total** $51,917
DEPARTMENT OF PLANT AND SOIL SCIENCE  
TEXAS TECH UNIVERSITY  
LUBBOCK, TX 79409-2122  
CURRICULUM VITAE

Brent C. Trela, Ph.D.  
Assistant Professor of Enology

Education:
Post Graduate Studies: MBA courses, French & Spanish.  

Professional Experience:
Assistant Professor of Enology. Texas Tech University, Department of Plant and Soil Science. Lubbock, TX. 2007 - present  
Extension Specialist. Texas A&M University, Texas AgriLife Extension. Lubbock, TX. 2007 - present  
Program Director of Distance Education in Winemaking. University of California, Davis, CA. 2004 - 2007  
Global Winery Startup Specialist (China). Purdue University. W. Lafayette, IN. December of 2006  
Lecturer (United Kingdom). Plumpton College. East Sussex, United Kingdom. 2000  
Principal. Alert Aesthetics. Hoodsport, WA. 1999  
Consulting Winemaker (Australia). Wise Vineyards. Dunsborough (Margaret River Region), Australia. 1998  
Director of Winemaking. Hoodsport Winery Inc. Hoodsport, WA. 1990 – 2000  

**Professional and Honorary Societies:**
American Society for Enology and Viticulture, Member, 1996 - present

Reviewer/Referee:
• Food Chemistry 2006 – present
• American Journal of Enology and Viticulture 2008 – present
• Georgian National Science Foundation 2008 – present
• Journal of the Science of Food and Agriculture 2008 – present
• Journal of Agricultural and Food Chemistry 2009 – present
• Enologyaccess.org

National Viticulture & Enology Extension Leadership Conference. Co-chair. Distance learning committee. 2008 - present

Texas Wine and Grape Growers Association. 2007-present, Support and consultation Committee and advisory group to draft the development of a National Enology Resource web site and outreach program, American Vineyard Foundation.

**Honors and Awards:**

**Principal Research Interests:**
Wine oxidation and stability issues through primary and applied research fields

**Books and Book Chapters (Total of 12):**


**Refereed Publications (Total of 4):**


**In Press:**

**In Review:**

**Technical Publications/Popular Articles/Media (Total of 29):**


Abstracts and Proceedings (Total of 12):


Seminars and Presentations (Total of 23):


17. Trela, B. Wine Stabilization with Phytic Acid. Texas Tech University, Department of Plant and Soil Sciences, Lubbock, TX. 2007 January 30. (Invited)


**Graduate Students Completed (Total of 0):**
**M.S. (Total of 0)**

**Certificate students:**

**Non-Thesis MS (Total of 0)**

**Ph.D. (Total of 0)**

**Graduate Students In Progress:**
**Certificate.**

**M.S.**


**Ph.D.**


**Graduate Committees:**
**M.S.**

**Ph.D.**


**Engagement:**
**A. University:**
1. Texas Tech University
   a. College of Agricultural Sciences and Natural Resources:
b. **Department of Plant and Soil Science:**
   1. Donated laboratory equipment valued at $4,560 to Texas Tech University Department of Plant and Soil Science for support of their research efforts benefiting the Texas wine industry. Additional equipment valued at more than $70,000 is on loan to the Dept.
   2. PSS Horticulture and Turfgrass Teaching Group Committee 2007-present
   3. PSS Student, Faculty, and Staff Recognition Committee 2007-present
   4. PSSViticulture and Enology Group 2007-present
   5. PSS Building planning committee 2008-present
   6. PSS Strategic planning committee 2008-present
   7. PSS Bioproducts ad-hoc committee 2008-present
   8. PSS Distance Education Committee 2010-present
   9. PSS Graduate Program Committee 2010-present

2. **Texas A&M University:**
   1. TX AgriLife Viticulture and Enology Group 2007-present

B. **Other Agencies:**
   1. Lead the development and coordination of an effective educational and applied research program to enhance the ability of Texas wine and grape growers to add value to their production through improved production and quality control practices. Help leverage Texas grape varieties and conditions to create unique products which are competitive nationally and internationally, while also addressing the needs of Texas winemakers. Link enology research and extension with wine and grape growers in Texas through individual and multi-disciplinary team efforts.
Curriculum Vitae
Thea A. Wilkins
Professor

Address:
Department of Plant Sciences
University of California
One Shields Avenue
Davis, CA 95616-8515
Tel: (530) 752-0614
Fax: (530) 752-4361
E-mail: tawilkins@ucdavis.edu

Education:
1990 Ph.D. Michigan State University, Plant Cell and Molecular Biology
1983 M.S. University of Georgia, Plant Genetics/Breeding
1980 B.S. Georgia Southern University, Plant Biology (Summa Cum Laude)

Research Positions:
2001-present Professor, Dept. of Plant Sciences, University of California-Davis
2004-present Adjunct Professor, Cotton Functional Genomics, Chinese Cotton Research Institute, Anyang, Henan Province, PRC
2003-present Co-Director, Cotton Functional Genomics Project, National Institute for Biotechnology & Genetic Engineering, Pakistan
2002-present Director, UCD Cotton Functional Genomics Center, University of California-Davis
1998-2002 Director, NSF (virtual) Cotton Genome Center, University of California-Davis
1996-2001 Associate Professor, Dept. of Agronomy and Range Science, University of California-Davis
1990-1996 Assistant Professor, Dept. of Agronomy and Range Science, University of California-Davis
1986-1989 Research Assistant, MSU-DOE Plant Research Laboratories, Michigan State University

Professional Service:
2004-2007 Western Section Representative to the Executive Committee of the American Society of Plant Biologists (ASPB)
2004-2005 Committee to draft ICGI Constitution & By-laws
2003-2005 Chair, International Cotton Genome Initiative, Functional Genomics Workgroup
2003-2004 Chair, Western Section American Society of Plant Biologists (WASPB)
2000-present Member, Executive Steering Committee for the International Cotton Genome Initiative (ICGI)
2000-present Member, Southern Regional Research Project S-304 on Development of Genetic Resources for Cotton
1998-2002 Associate Editor, Journal of Cotton Science
1999-present Editorial Board, Journal of Cotton Science
2002-04,1999 NSF Metabolic Biochemistry Review Panel
1990-present Member, Genetics Graduate Group, Plant Biology Graduate Group, UC Biotechnology Program, Plant Genomics Education and Research Program

Publications in last 5 years (72 total):


Alabady MS, Arpat AB, Wright R, Wilkins TA (200X) Fiber alleles differentially expressed in Pima cotton are linked to major fiber quality QTL. In Preparation.


**Synergistic Activities:**

Integration of research and education: In keeping with the mission of the department, college and campus, my focus on crop improvement using molecular tools integrates basic and applied research with agricultural applications is tightly linked to training, education and outreach activities. I have mentored 8 graduate students, 8 postdoctoral scientists, 40 undergraduates, and 5 high school students, served as academic advisor to undergraduate and graduate students, serve on 2-3 thesis committees each year, and serve on curriculum development committees at both the graduate and undergraduate levels.

Innovations in teaching and training: My primary teaching responsibility, which incorporates cutting edge technological advances, including those from my research program, is Plant Genetics & Genomics. In the last two years, I have incorporated teaching modules in bioinformatics and functional genomics as companions to 10 extensive problem sets that utilize data from our genome research. Student evaluations for this class average 4.5/5.0. I participated in creating a Biotechnology major, and designed and served as lead instructor for two requisite lab courses (PLB161A/B) in Plant Genetics & Biotechnology. I also serve as a participating member of the campus Biotechnology Program, and am currently a trainer on two campus education grants.

Development of research tools, computation methods, and algorithms for problem-solving: We have established criteria to quality-control EST and microarray data as part of our SOPs that will serve as the standard for the cotton community. Programs were tested and evaluated to set parameters to provide high quality unigene sets subjected to functional binning. We developed software to allow normalization of filter macroarrays to eliminate 80% redundancy in EST projects (Arpat et al. 2004). New algorithms and software were developed for mining of our fiber dbEST for SSRs as the first step towards aiding the community in development of robust, portable PCR-based DNA markers (Park et al. 200X; http://cfgc.ucdavis.edu). Significant
advances in cotton biotechnology were made with NSF funding (Mishra and Wilkins 2003; Wilkins et al. 2004; Mishra and Wilkins, In Prep).

**Development of databases:** Public databases developed under NSF support (DBI 9872630) includes a searchable EST database binned by function using GO, and a cDNA clone relational db to facilitate ordering of biological materials through the UCD Cotton Functional Genomics Center. The db has been expanded to allow posting of microarray data. We have established the foundation for linking ESTs to markers and map data (www.plantgenome.uga.edu) and other relevant sites.

**Broadening participation of under-represented groups:** Past and present members of my research group are equally distributed by gender, the majority of which are represented by diverse ethnic backgrounds (Asian, Indian, African, Hispanic, Vietnamese-American, Chinese-American, and Turkish).

**Professional Service:** I have been an Associate Editor and serve on an Editorial Board, served as an ad hoc reviewer for journals and panelist for state, campus, commodity, federal and international funding agencies, and am the former Chair of the Western Section of the American Society of Plant Biologists (ASPB), and now serve as the WAPB representative to the ASPB Executive Committee. I am a scientific advisor on two major international programs, and have collaborative ties to the international community, including as member of the International Cotton Genome Initiative’s (ICGI) Executive Steering Committee, and Chair, of ICGI’s Functional Genomics Workgroup.

**Funding (1993-2004):** >$6,500,000 from NSF, DOE, USDA, Cotton Incorporated, US-Egypt Technical Program, Biotechnology Program, and commodity groups, excluding numerous training and education grants

Curriculum Vitae
Thea A. Wilkins
Professor

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Tel: (530) 752-0614  
Fax: (530) 752-4361  
E-mail: tawilkins@ucdavis.edu

Web Page: http://cfgc.ucdavis.edu

Education:  
1990  Ph.D.  Michigan State University, Plant Cell and Molecular Biology  
1983  M.S.  University of Georgia, Plant Genetics/Breeding  
1980  B.S.  Georgia Southern University, Plant Biology (*Summa Cum Laude*)

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2002-present  Director, UCD Cotton Functional Genomics Center, University of California-Davis  
1998-2002  Director, NSF (virtual) Cotton Genome Center, University of California-Davis  
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1990-1996  Assistant Professor, Dept. of Agronomy and Range Science, University of California-Davis  
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2000-present  Member, Southern Regional Research Project S-304 on Development of Genetic Resources for Cotton  
1998-2002  Associate Editor, Journal of Cotton Science  
1999-present  Editorial Board, Journal of Cotton Science  
2002-04,1999  NSF Metabolic Biochemistry Review Panel  
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**Synergistic Activities:**

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advances in cotton biotechnology were made with NSF funding (Mishra and Wilkins 2003; Wilkins et al. 2004; Mishra and Wilkins, In Prep).

Development of databases: Public databases developed under NSF support (DBI 9872630) includes a searchable EST database binned by function using GO, and a cDNA clone relational db to facilitate ordering of biological materials through the UCD Cotton Functional Genomics Center. The db has been expanded to allow posting of microarray data. We have established the foundation for linking ESTs to markers and map data (www.plantgenome.uga.edu) and other relevant sites.

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Funding (1993-2004): >$6,500,000 from NSF, DOE, USDA, Cotton Incorporated, US-Egypt Technical Program, Biotechnology Program, and commodity groups, excluding numerous training and education grants

Kirk Williams

ACHIEVEMENTS
• Developed the online courses for a Viticulture Certificate program.
• Developed a Horticulture/Turfgrass Associates degree program for a community college.
• NISOD Teaching Excellence Award for Dedication and Persistence -
• Texas Certified Nursery Professional – Texas Nursery & Landscape Assoc.

WORK EXPERIENCE
Senior Teacher – Plant & Soil Science Dept. - Viticulture Certificate Program
January 2008 to Present
Texas Tech University – Lubbock, TX
• Responsible for developing the online courses for the Viticulture Certificate program to include narrated PowerPoint presentations, quizzes and assignments. Taught the online courses and assisted with the hands on portion of the Vineyard Practices sessions.

Instructor(Agriculture/Horticulture)-Part Time & Full Time
August 1996 to May 2014
Palo Alto College- San Antonio, TX
• Responsible for instruction, advising, and recruiting new students.
  Oversaw operations of greenhouse, turfgrass and horticulture demonstration areas and plant nursery. Supervised part-time workers that maintained greenhouse, plant nursery and horticulture demonstration areas. Did purchasing for program. Managed budgets for program.

Owner/Operator-October 1997 to Present
Williams Ranch Vineyard-Tokio, TX
• Responsible for the planning, planting, maintenance practices, cultural practices, and harvesting wine grapes from a small commercial vineyard.

Owner/Operator-June 1996-June 1998
Agricola Services-San Antonio, TX
• Responsible for application, marketing and bookkeeping of a small business that did lawn fertilizing and weed control.

Technical Sales Representative-September 1989-February 1996
ICI/Zeneca Ag Products-Sacramento, CA
• Managed a four million-dollar territory in N. California. Sold a product line consisting of 25 different products on over 30 different crops. Managed sales interns. Managed customer relations and gave pest control advice as a licensed CA Pest Control Advisor.

EDUCATION
• Oklahoma State University-M.S. in Agronomy (Weed Science Emphasis)-1988
• Texas Tech University-B.S. in Agronomy-1986

OTHER
• TDA Non-Commercial Applicators License
• Member-American Society of Enology and Viticulture
• Member-Texas Wine Grape Growers Association
## APPENDIX H

### GRE revised General Test Scores

*(Information taken from http://www.ets.org/gre/institutions/scores/)*

For tests taken on or after August 1, 2011

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<th>Section</th>
<th>Score Scale</th>
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<td>Verbal Reasoning</td>
<td>130-170, in 1-point increments</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>130-170, in 1-point increments</td>
</tr>
</tbody>
</table>

For tests taken prior to August 1, 2011

<table>
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<tr>
<th>Section</th>
<th>Score Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Reasoning</td>
<td>200-800, in 10-point increments</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>200-800, in 10-point increments</td>
</tr>
</tbody>
</table>
APPENDIX I

UNIT ASSESSMENT REPORT – TRACDAT
# Degree Program - CASNR - Horticulture (MS)

**Accrediting Body:**
N/A

**CIP Code:**
01.0601.00

**Degree Program Coordinator:**
Eric F. Hequet

**Email:**
eric.hequet@ttu.edu

**Phone:**
(806) 834-0621

---

## Purpose Statement

The College of Agriculture and Science and Natural Resources is dedicated to providing programs of excellence in teaching, research, and outreach. These educational programs are designed to prepare the student for the dynamic agricultural and renewable natural resources industry—industries that encompass five closely related segments: (1) producing agricultural products; (2) supplying agricultural chemical, feed, seed, and other production resources; (3) processing, storing, distributing, and other marketing functions; (4) planning and managing programs for renewable natural resources; and (5) providing technical assistance, financing, extension, education, research, and communication in all sectors of the food, fiber, and natural resource complex.

---

## Student Learning Outcomes

<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up:</th>
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</thead>
<tbody>
<tr>
<td>Field of Horticultural Science at their oral exam</td>
<td>Students will defend their individual project and general knowledge in the field of Horticultural Science at their oral exam.</td>
<td>05/18/2015 - All students (2 of 2) presented a comprehensive oral exam on Campus in 14-15. 05/18/2015 - All students (3 of 3) successfully defended their thesis in 14-15.</td>
<td>Evidence of Improvement: 05/28/2015 - Increase the percentage of students able to write successfully a publication for submission to a referee journal. Follow-Up: Evidence of Improvement: 05/28/2015 - Five files document the actions for improvement this year. They are: (1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx, (2) GradStudent.Abstracts&amp;Proceedings 2014-15.docx, (3) GradStudent Electronic Media 2014-15.docx, (4) GradStudent Book Chapters 2014-15.docx, (5) GradStudent Refereed Journals 2014-15.docx.</td>
</tr>
<tr>
<td>Criteria Met</td>
<td>Criterion Met</td>
<td>Action Status: Action In Progress</td>
<td></td>
</tr>
</tbody>
</table>

---

**Follow-Up:**

Evidence of Improvement:

05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings.

Follow-Up: Evidence of Improvement:

11/05/2015 2:00 PM Generated by TracDat a product of Nuventive.
05/28/2015 - Increase the percentage of students receiving an award (TTU, Regional, National)

Follow-Up: Evidence of Improvement:

06/23/2015 - All students (3 of 3) defended their individual project and general knowledge in the field of Horticultural Science at their oral exam

Result Type:
Criterion Met

Assessment Method Category:
Oral exam

Assessment Method:
Students will defend their individual project and general knowledge in the field of Horticultural Science at their oral exam.

Action Status:
Action In Progress

08/10/2015 - No assessment was performed for the summer

Result Type:
Inconclusive

Follow-Up:

05/28/2015 - Five files document the actions for improvement this year. They are:
(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx,
(2) GradStudent Abstracts&Proceedings 2014-15.docx,
(3) GradStudent Electronic Media 2014-15.docx
(4) GradStudent Book Chapters 2014-15.docx
(5) GradStudent Refereed Journals 2014-15.docx

08/10/2015 - 12.5% of students received an award (TTU, Regional, National)

Follow-Up:

Regional, National

11/05/2015 2:00 PM

Follow-Up:

Regional, National

Actions for Improvement:

- Increase the percentage of students receiving an award (TTU, Regional, National)
- Increase the number of students defending their individual project in Horticultural Science.
**Student Learning Outcome:**

- **Assessment Method:** Students will present a comprehensive oral exam.
- **Criterion:** 95% of all students will successfully complete and defend their individual project and general knowledge in the field of Horticultural Science at their oral exam.

**Results:**

- **Action Status:** Action In Progress

---

**Assessment Method:** Students will write scientific peer-review publications and submit abstracts for oral presentation.

**Criterion:** 95% of students will successfully write peer-review publications and submit abstracts for oral presentations.

**Results:**

- **Action Status:** Action In Progress

---

**Assessment Method:** Students will successfully complete their thesis project and successfully defend their applied and theoretical knowledge of Horticultural Science at their oral exam.

**Criterion:** 95% of all students will successfully complete and defend their applied and theoretical knowledge of Horticultural Science at their oral exam.

**Results:**

- **Action Status:** Action In Progress
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement

Assessment Method:

Students will successfully complete their thesis project and successfully defend their applied and theoretical knowledge of Horticultural Science at their oral exam.

Assessment Method Category:

Oral exam

Criterion:

95% of all students will successfully complete their thesis research and defend their applied and theoretical knowledge of Horticultural Science at their oral exam.

08/16/2015 - This is a new assessment method. Results to be added 2016

Result Type:

Inconclusive

Action Status:

No Action Needed

08/10/2015 - No assessment was performed for the summer.

Result Type:

Inconclusive

Action Status:

Action In Progress

05/18/2015 - All students (2 of 2) completed their non-thesis in 14-15.

All students (3 of 3) completed their thesis in 14-15.

Result Type:

Criterion Met

Action Status:

Action In Progress

Related Documents:

GradStudent Info.docx
GradStudent.EnrollmentNumbers.2008toPresent.xlsx
GradStudent Abstracts & Proceedings 2014-15.docx
GradStudent Electronic Media 2014-15.docx
GradStudent Book Chapters 2014-15.docx
GradStudent Refereed Journals 2014-15.docx

05/28/2015 - Increase the percentage of students able to write successfully a publication for submission to a referee journal

Follow-Up: Evidence of Improvement:

05/28/2015 - Five files document the actions for improvement this year. They are:

(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx,
(2) GradStudent Abstracts & Proceedings 2014-15.docx,
(3) GradStudent Electronic Media 2014-15.docx,
(4) GradStudent Book Chapters 2014-15.docx,
(5) GradStudent Refereed Journals 2014-15.docx

05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings

Follow-Up: Evidence of Improvement:

05/28/2015 - Five files document the actions for improvement this year. They are:

(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx,
(2) GradStudent Abstracts & Proceedings 2014-15.docx,
(3) GradStudent Electronic Media 2014-15.docx,
(4) GradStudent Book Chapters 2014-15.docx,
(5) GradStudent Refereed Journals 2014-15.docx
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement

Follow-Up: Evidence of Improvement:

05/27/2015 - Increase the percentage of students receiving an award (TTU, Regional, National)

Follow-Up: Evidence of Improvement:

05/28/2015 - Five files document the actions for improvement this year. They are:

(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx
(3) GradStudent ELECTRONIC MEDIA 2014-15.docx
(4) GradStudent Book Chapters 2014-15.docx
(5) GradStudent Refereed Journals 2014-15.docx

Assessment Method:

Develop relevant literature review for the research project

Assessment Method Category:

Student Projects

Criterion:

95% of students will successfully develop and present their literature review to their advisor

08/10/2015 - No assessment was performed for the summer

Result Type:

Inconclusive

Action Status:

Action In Progress

06/22/2015 - All students (3 of 3) completed their thesis in 14-15

Result Type:

Criterion Met

Action Status:

Action In Progress

06/22/2015 - Increase the number of students completing their thesis and non-thesis.

Assessment Method:

Students will write peer-review papers in refereed journals

08/10/2015 - No assessment was performed for the summer

Result Type:

Inconclusive

Action Status:

Action In Progress
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement

Assessment Method Category:
Thesis

Inconclusive

Action Status:
Action In Progress

06/22/2015 - Results to be added January 31, 2016.

Assessment Method Category:
Oral exam

Criterion:
95% of students will successfully defend their individual project and general knowledge in the field of Horticultural Science at their oral exam.

08/16/2015 - This is a new assessment method. Results to be added 2016

Result Type:
Inconclusive

Action Status:
No Action Needed

08/10/2015 - No assessment was performed for the summer

Result Type:
Inconclusive

Action Status:
Action In Progress

05/20/2015 - All students (3 of 3) defended their individual thesis.

Outcome Types:
Student Learning

Start Date:
08/25/2014

Outcome Status:
Active

Assessment Method:
Students will present their individual project and general knowledge in the field of Horticultural Science at their oral exam.

Assessment Method Category:
Oral exam

Criterion:
95% of students will successfully present their individual project and general knowledge in the field of Horticultural Science at their oral exam.

05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference.

Follow-Up: Evidence of Improvement:

05/28/2015 - The Student Learning Outcome document lists the actions for improvement this year.

Related Documents:

- GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- GradStudent Abstracts & Proceedings 2014-15.docx

05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference.
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Follow-Up: Evidence of

Evidence of Improvement

GradStudent Electronic Media 2014-15.docx
GradStudent Book Chapters 2014-15.docx
GradStudent Refereed Journals 2014-15.docx

05/28/2015 - Increase the percentage of students receiving an award (TTU, Regional, National)

Follow-Up: Evidence of

Evidence of Improvement

05/27/2015 - Five files document the actions for improvement this year. They are:

(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx,
(2) GradStudent.Abstracts&Proceedings 2014-15.docx,
(3) GradStudent Electronic Media 2014-15.docx
(4) GradStudent Book Chapters 2014-15.docx
(5) GradStudent Refereed Journals 2014-15.docx

05/27/2015 - Increase the number of refereed journal publications with at least one graduate student listed as an author or co-author

Follow-Up: Evidence of

Evidence of Improvement

Regional, National Students exceeding an average (TTU, Regional, National)

Follow-Up: Evidence of

Evidence of Improvement

GradStudent Electronic Media 2014-15.docx
GradStudent Refereed Journals 2014-15.docx
GradStudent Book Chapters 2014-15.docx
GradStudent Electronic Media 2014-15.docx
GradStudent Refereed Journals 2014-15.docx
GradStudent Book Chapters 2014-15.docx
<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop experimental design to conduct research project</td>
<td><strong>Assessment Method:</strong> Develop experimental design to conduct research project.</td>
<td><strong>Action for Improvement &amp; Follow-Up:</strong> Evidence of Improvement</td>
</tr>
<tr>
<td><strong>Criterion:</strong> 95% of students will successfully develop experimental design to conduct research project</td>
<td><strong>Action Status:</strong> Action In Progress. <strong>Result Type:</strong> Criterion Met. <strong>Date:</strong> 06/22/2015. <strong>Follow-Up:</strong> Evidence of Improvement.</td>
<td><strong>6/22/2015 - All students (2 of 2) presented a comprehensive oral exam in 2014-15.</strong></td>
</tr>
<tr>
<td>Develop statistical means to analyze data</td>
<td><strong>Assessment Method:</strong> Develop statistical means to analyze data.</td>
<td><strong>Action for Improvement &amp; Follow-Up:</strong> Evidence of Improvement</td>
</tr>
<tr>
<td><strong>Criterion:</strong> Each student defending their thesis increased the number of speeches</td>
<td><strong>Action Status:</strong> Action In Progress. <strong>Result Type:</strong> Criterion Met. <strong>Date:</strong> 06/22/2015. <strong>Follow-Up:</strong> Evidence of Improvement.</td>
<td><strong>6/22/2015 - Increase the number of students presenting comprehensive oral exams.</strong></td>
</tr>
</tbody>
</table>

**Related Documents:**
- GradStudent.EnrollmentNumbers.2008t to Present.xlsx
- GradStudent Abstracts & Proceedings 2014-15.docx
- GradStudent Electronic Media 2014-15.docx
- GradStudent Book Chapters 2014-15.docx
- GradStudent Refereed Journals 2014-15.docx
- GradStudent Electronic Media 2014-15.docx
### Student Learning Outcomes

#### Means of Assessment & Criteria / Tasks

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Assessment Method</th>
<th>Assessment Method Category</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students will present their thesis research in PSS 5100 seminar</td>
<td>Course Level Assessment</td>
<td>95% students will pass PSS 5100 seminar</td>
</tr>
</tbody>
</table>

**Action for Improvement & Follow-Up:**

- **Evidence of Improvement:** produced in the research project
- **Criterion:** 95% of students will successfully develop experimental design to conduct research project
- **Result Type:** Inconclusive
- **Action Status:** Action In Progress

**Related Documents:**

- GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- GradStudent Abstracts & Proceedings 2014-15.docx
- GradStudent Electronic Media 2014-15.docx
- GradStudent Book Chapters 2014-15.docx
- GradStudent Refereed Journals 2014-15.docx

**Action:**

- Increase the number of students presenting comprehensive oral exam.

---

**Degree Program - CASNR - Horticulture (MS)**

- Develop Communication Skills - Students will communicate in oral form appropriate for research level position in horticulture.

#### Assessment Method

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Assessment Method</th>
<th>Assessment Method Category</th>
<th>Criterion</th>
</tr>
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<tbody>
<tr>
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<td>Students will present their thesis research in PSS 5100 seminar</td>
<td>Course Level Assessment</td>
<td>95% students will pass PSS 5100 seminar</td>
</tr>
</tbody>
</table>

**Action for Improvement & Follow-Up:**

- **Evidence of Improvement:** produced in the research project
- **Criterion:** 95% of students will successfully develop experimental design to conduct research project
- **Result Type:** Inconclusive
- **Action Status:** Action In Progress

---

**Related Documents:**

- GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- GradStudent Abstracts & Proceedings 2014-15.docx
- GradStudent Electronic Media 2014-15.docx
- GradStudent Book Chapters 2014-15.docx
- GradStudent Refereed Journals 2014-15.docx

**Action:**

- Increase the attendance and participation in field days.

---

**Degree Program - CASNR - Horticulture (MS)**

- Develop Communication Skills - Students will communicate in oral form appropriate for research level position in horticulture.

#### Assessment Method

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Assessment Method</th>
<th>Assessment Method Category</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students will present their thesis research in PSS 5100 seminar</td>
<td>Course Level Assessment</td>
<td>95% students will pass PSS 5100 seminar</td>
</tr>
</tbody>
</table>

**Action for Improvement & Follow-Up:**

- **Evidence of Improvement:** produced in the research project
- **Criterion:** 95% of students will successfully develop experimental design to conduct research project
- **Result Type:** Inconclusive
- **Action Status:** Action In Progress

---

**Related Documents:**

- GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- GradStudent Abstracts & Proceedings 2014-15.docx
- GradStudent Electronic Media 2014-15.docx
- GradStudent Book Chapters 2014-15.docx
- GradStudent Refereed Journals 2014-15.docx

**Action:**

- Increase the number of students presenting comprehensive oral exam.
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Follow-Up: Evidence of Improvement

Action Status:

Action In Progress

Related Documents:

GradStudent Info.docx
GradStudent.EnrollmentNumbers.2008toPresent.xlsx
GradStudent Abstracts & Proceedings 2014-15.docx
GradStudent Electronic Media 2014-15.docx
GradStudent Faculty Book Chapters 2014-15.docx
GradStudent Refereed Journals 2014-15.docx

Follow-Up: Evidence of Improvement:

05/28/2015 - Five files document the actions for improvement this year. They are:
1. GradStudent.EnrollmentNumbers.2008toPresent.xlsx
4. GradStudent Faculty Book Chapters 2014-15.docx
5. GradStudent Refereed Journals 2014-15.docx

05/27/2015 - Increase the number of oral presentations (TTU, Regional, National)

Follow-Up: Evidence of Improvement:

05/28/2015 - Five files document the actions for improvement this year. They are:
1. GradStudent.EnrollmentNumbers.2008toPresent.xlsx
4. GradStudent Faculty Book Chapters 2014-15.docx
5. GradStudent Refereed Journals 2014-15.docx

05/27/2015 - Increase the attendance and participation in producers meetings

Follow-Up: Evidence of Improvement:

05/28/2015 - Five files document the actions for improvement this year. They are:
1. GradStudent.EnrollmentNumbers.2008toPresent.xlsx
4. GradStudent Faculty Book Chapters 2014-15.docx
5. GradStudent Refereed Journals 2014-15.docx

11/05/2015 2:00 PM Generated by TracData a product of Nuventive.
<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evidence of Improvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Follow-Up: Evidence of Improvement</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(2) GradStudent Abstracts &amp; Proceedings 2014-15.docx</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) GradStudent Electronic Media 2014-15.docx</td>
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<td>(4) GradStudent Book Chapters 2014-15.docx</td>
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<tr>
<td></td>
<td>(5) GradStudent Refereed Journals 2014-15.docx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment Method:</td>
<td>Students will present posters and make oral presentations in conference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment Method Category:</td>
<td>Professional Development Activities</td>
<td></td>
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</tr>
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<td></td>
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<tr>
<td>Related Documents:</td>
<td>GradStudent Info.docx</td>
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</tr>
<tr>
<td></td>
<td>Increase the number of students participating and presenting in industry field days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment Method:</td>
<td>Students will participate and present their research in industry field day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment Method Category:</td>
<td>Professional Development Activities</td>
<td></td>
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<tr>
<td>Action Status:</td>
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<tr>
<td>Related Documents:</td>
<td>GradStudent Info.docx</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase the attendance and participation in industry field days</td>
<td></td>
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</tr>
<tr>
<td>Assessment Method:</td>
<td>Students will successfully defend their thesis</td>
<td></td>
<td></td>
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<tr>
<td>Assessment Method Category:</td>
<td>Course Level Assessment</td>
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<tr>
<td>Related Documents:</td>
<td>GradStudent Info.docx</td>
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<tr>
<td></td>
<td>Increase the attendance in PSS 5100 seminar</td>
<td></td>
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<tr>
<td>Assessment Method:</td>
<td>Students will present posters and make oral presentations in conference</td>
<td></td>
<td></td>
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<tr>
<td>Assessment Method Category:</td>
<td>Professional Development Activities</td>
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<td>Related Documents:</td>
<td>GradStudent Info.docx</td>
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<tr>
<td></td>
<td>Increase the number of students participating and presenting in conferences</td>
<td></td>
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<tr>
<td>Assessment Method:</td>
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<td></td>
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<td>Action Status:</td>
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<tr>
<td>Related Documents:</td>
<td>GradStudent Info.docx</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase the attendance in PSS 5100 seminar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Degree Program - CASNR - Horticulture (MS)

#### Applied and Theoretical Knowledge - Students will demonstrate applied and theoretical knowledge within their field of Horticulture.

<table>
<thead>
<tr>
<th>Outcome Types</th>
<th>Student Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date</td>
<td>02/01/2006</td>
</tr>
<tr>
<td>End Date</td>
<td>04/28/2015</td>
</tr>
<tr>
<td>Outcome Status</td>
<td>Inactive</td>
</tr>
</tbody>
</table>

**Assessment Method:** Students will successfully complete their thesis project and successfully defend their applied and theoretical knowledge of Horticultural Science at their oral exam.

**Assessment Method Category:** Oral exam

**Criterion:** 95% of all students will successfully complete their thesis research and defend their applied and theoretical knowledge of Horticultural Science at their oral exam.

<table>
<thead>
<tr>
<th>Start Date</th>
<th>10/28/2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action Status</td>
<td>In Progress</td>
</tr>
</tbody>
</table>

**Related Documents:** GradStudent.EnrollmentNumbers.2008toPresent.xlsx

---

### Follow-Up: Evidence of Improvement

<table>
<thead>
<tr>
<th>Date</th>
<th>Action in Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/28/2014</td>
<td>All students (4 of 4) completed their thesis in 06-07.</td>
</tr>
<tr>
<td></td>
<td>All students (4 of 4) completed their thesis in 07-08.</td>
</tr>
<tr>
<td></td>
<td>All students (3 of 3) completed their thesis in 08-09.</td>
</tr>
<tr>
<td></td>
<td>All students (2 of 2) completed their thesis in 09-10.</td>
</tr>
<tr>
<td></td>
<td>All students (1 of 1) completed their thesis in 10-11.</td>
</tr>
<tr>
<td></td>
<td>All students (3 out of 3) completed their thesis in 11-12. In addition, 5 MS non-thesis graduated.</td>
</tr>
<tr>
<td></td>
<td>All students (3 of 3) completed their thesis in 12-13. In addition, 6 MS non-thesis graduated.</td>
</tr>
</tbody>
</table>

**Result Type:** Criterion Met

**Action Status:** In Progress

**Related Documents:**
- 2010 Student publications.docx
- Data_10-11.xlsx
- Narrative of continuous improvement Sept 2011.docx
- Data_11-12.xlsx
- Graduate Student Publications Abstracts and Awards 2012.pdf
- Narrative of continuous improvement Sept 2012.pdf
- Data_12-13.xlsx
- Graduate Student Publications Abstracts and Awards 2013.pdf
- Narrative of continuous improvement Sept 2013.pdf
- PSS MS Graduate Award 2-6-13.pdf
- PSS PhD Graduate Award 2-6-13.docx
- Data 2013-14 Graduate Student Enrollment 2013-14
- Narrative continuous improvement 2013-14.pdf
- PSS MS Graduate Award 2013-14
- PSS PhD Graduate Award 2013-14
- PSS Recruitment Plan 2013-14
### Student Learning Outcomes

<table>
<thead>
<tr>
<th>Degree Program</th>
<th>CASNR - Horticulture (MS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective:</strong></td>
<td>Students will demonstrate the use of critical thinking to identify problems and derive conclusions in a complex global society.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Outcome Types:</strong></th>
<th><strong>Student Learning</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start Date:</strong></td>
<td>02/01/2006</td>
</tr>
<tr>
<td><strong>End Date:</strong></td>
<td>04/30/2015</td>
</tr>
<tr>
<td><strong>Assessment Period:</strong></td>
<td>09/26/2013 - 04/30/2015</td>
</tr>
<tr>
<td><strong>Assessment Method:</strong></td>
<td>Students will defend their individual project and general knowledge in the field of Horticultural Science at their oral exam.</td>
</tr>
<tr>
<td><strong>Assessment Method Category:</strong></td>
<td>Oral exam</td>
</tr>
<tr>
<td><strong>Criterion:</strong></td>
<td>95% of students will successfully defend their individual project and general knowledge in the field of Horticultural Science at their oral exam.</td>
</tr>
</tbody>
</table>

#### Results

- **10/28/2014:** All students (4 of 4) successfully defended their thesis in 06-07.
- **11/05/2015:** All students (3 of 3) successfully defended their thesis in 07-08.
- **12/15/2015:** All students (2 of 2) successfully defended their thesis in 08-09.
- **12/16/2016:** All students (1 of 1) successfully defended their thesis in 09-10.
- **10/26/2017:** All students (3 of 3) successfully defended their thesis in 10-11.
- **10/26/2018:** All students (4 of 4) successfully defended their thesis in 11-12.
- **10/26/2013:** In addition, 3 MS non-thesis graduated.
- **10/26/2014:** In addition, 4 MS non-thesis graduated.
- **10/26/2015:** In addition, 5 MS non-thesis graduated.
- **10/26/2016:** In addition, 6 MS non-thesis graduated.
- **10/26/2017:** In addition, 7 MS non-thesis graduated.

#### Follow-Up: Evidence of Improvement

- **09/26/2013:** Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013. pdf, (4) PSS MS Graduate Award 2-6-13.pdf.pdf and (5) PSS PhD Graduate Award 2-6-13.

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#### Additional Notes

- Graduate Student Abst. & Proc. 2013-14
- Graduate Student Publications 2013-14
- Graduate Student Handbook 2013-14

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#### Means of Assessment & Criteria / Tasks

- Criteria: The major professor approved the submission.

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#### Action for Improvement & Follow-Up:

- Evidence of Improvement

---

**NOTE:** All tables and figures are omitted for brevity.
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement


Result Type: Criterion Met
Action Status: Action In Progress

Related Documents:
Narrative of continuous improvement Sept 2011.docx
2010 Student publications.docx
Data_10-11.xlsx
Data_11-12.xlsx
Graduate Student Publications Abstracts and Awards 2012.pdf
Narrative of continuous improvement Sept 2012.pdf
Data_12-13.xlsx
Gradmate Student Publications Abstracts and Awards 2013.pdf
Narrative of continuous improvement Sept 2013.pdf
PSS MS Graduate Award 2-6-13.pdf
PSS PhD Graduate Award 2-6-13.pdf
Data 2013-14 Graduate Student Enrollment 2013-14
Narrative continuous improvement 2013-14.pdf
PSS MS Graduate Award 2013-14
PSS Recruitment Plan 2013-14
PSS Graduate Handbook 2013-14
Graduate Student Abstracts & Proc. 2013-14
Graduate Student Publications 2013-14
PSS 2013-14
PSS Graduate Student Flyer 2013-14
09/26/2013 - Increase the percentage of students receiving an award (TTU, regional, national).
Follow-Up: Evidence of Improvement:
09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2-6-13.pdf, and (5) PSS PhD Graduate Award 2-6-13.

09/26/2013 - Increase the number of refereed journal publications with at least one graduate student listed as first author or co-author.
Follow-Up: Evidence of Improvement:
09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2-6-13.pdf, and (5) PSS PhD Graduate Award 2-6-13.

09/26/2013 - Increase the number of refereed conference publications with at least one graduate student listed as first author or co-author.
Follow-Up: Evidence of Improvement:
09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2-6-13.pdf, and (5) PSS PhD Graduate Award 2-6-13.
null
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement

PSS Recruitment Plan 2013-14
PSS Graduate Handbook 2013-14
Graduate Student Abstracts & Proceedings 2013-14
Graduate Student Publications 2013-14
PSS Graduate Student Flyer 2013-14

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the number of oral presentations (TTU, regional, national).
Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year:
- (1) Data-13-13.xlsx
- (2) Graduate Student Publications 2013-14
- (3) Narrative of Continuous Improvement Sept 2013
- (4) PSS MS Graduate Award 2-6-13.pdf
- (5) PSS PhD Graduate Award 2-6-13.pdf

09/26/2013 - Five files document the improvements:
- (1) Data-13-13.xlsx
- (2) Graduate Student Publications 2013-14
- (3) Narrative of Continuous Improvement Sept 2013
- (4) PSS MS Graduate Award 2-6-13.pdf
- (5) PSS PhD Graduate Award 2-6-13.pdf
Purpose Statement:
The College of Agriculture and Science and Natural Resources is dedicated to providing programs of excellence in teaching, research, and outreach. These educational programs are designed to prepare the student for the dynamic agricultural and renewable natural resources industry—an industry that encompasses five closely related segments: (1) producing agricultural products; (2) supplying agricultural chemical, feed, seed, and other production resources; (3) processing, storing, distributing, and other marketing functions for agricultural products; (4) developing and implementing sustainable agricultural practices; and (5) providing technical assistance, training, services, education, research, and communication to all sectors of the food, feed, fiber, and renewable resources system. Achievements in these fields are fundamental to the economic health of communities and the nation.

Student Learning Outcomes:

Degree Program - CASNR - Plant and Soil Science (MS) - Develop an understanding of both Applied and Theoretical Knowledge principles of Plant and Soil Science - Students will develop and demonstrate theoretical and applied knowledge within their field of Plant and Soil Science.

Outcome Types:

- Student Learning

Start Date: 08/25/2014

Outcome Status: Active

Assessment Method:
Students will write a thesis as evidence of applied and theoretical knowledge in their field of Plant and Soil Science.

Assessment Method Category:
Oral exam

Criterion:
95% of all students will successfully complete a thesis and defend their applied and theoretical knowledge in their field of Plant and Soil Science.

Results:
05/20/2015 - All students (14 of 14) successfully completed their thesis in 14-15.

Action for Improvement & Follow-Up:

Follow-Up: Evidence of Improvement:

05/28/2015 - Increase the percentage of students able to write successfully a publication for submission to a referee journal.

Related Documents:

GradStudent Info 2014-15.docx
GradStudent EnrollmentNumbers.2008toPresent.xlsx
GradStudent Abstracts&Proceedings 2014-15.docx
GradStudent Electronic Media 2014-15.docx
GradStudent Faculty Book Chapters 2014-15.docx
GradStudent Refereed Journals 2014-15.docx
<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assessment Method:</td>
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<tr>
<td></td>
<td>Students will write a thesis as evidence of applied and theoretical knowledge in their field of Plant and Soil Science</td>
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<tr>
<td></td>
<td>Assessment Method Category:</td>
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<tr>
<td></td>
<td>Oral exam</td>
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<tr>
<td></td>
<td>Criterion:</td>
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<tr>
<td></td>
<td>95% of all students will successfully complete a thesis and defend their applied and theoretical knowledge in their field of Plant and Soil Science</td>
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<tr>
<td></td>
<td>Result Type:</td>
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<tr>
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</table>

08/10/2015 - No assessment was performed for the

<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
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<th>Results</th>
<th>Action for Improvement &amp; Follow-Up</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Assessment Method:</td>
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<tr>
<td></td>
<td>Oral exam</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Criterion:</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>All students (2 of 2) successfully completed their thesis in 2014-15.</td>
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</tbody>
</table>

06/23/2015 - Increase the percentage of students able to write successfully a publication for submission to a referee journal.

<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
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<tr>
<td></td>
<td>Assessment Method:</td>
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<td></td>
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<td></td>
<td>Criterion:</td>
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<tr>
<td></td>
<td>All students (2 of 2) successfully completed their thesis in 2014-15.</td>
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<td>Result Type:</td>
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<tr>
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<td>Criterion Met</td>
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<tr>
<td></td>
<td>Action In Progress</td>
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<td></td>
</tr>
</tbody>
</table>

05/28/2015 - Five files document the actions for improvement this year. They are:

1. GradStudent.EnrollmentNumbers.2008toPresent.xlsx

06/23/2015 - All students (14 of 14) successfully completed their thesis in 14-15.

All students (2 of 2) successfully completed their non-thesis in 14-15.

Result Type: Criterion Met

Action Status: Action In Progress

08/10/2015 - No assessment was performed for the
<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Assessment Method</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will successfully complete their thesis and successfully defend their applied and theoretical knowledge of Horticultural science at their oral exam</td>
<td></td>
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<tr>
<td>Assessment Method Category: Oral exam</td>
<td>Criterion: 95% of all students will successfully complete their thesis research and defend their field of applied and theoretical knowledge of Plant and Soil Science</td>
<td>Action Status: Action In Progress</td>
<td>Action Status: Action In Progress</td>
</tr>
<tr>
<td>Assessment Method Category: Case Studies</td>
<td>Criterion: 95% of all students will develop relevant literature review of their research project</td>
<td>Action Status: Action In Progress</td>
<td>Action Status: Action In Progress</td>
</tr>
<tr>
<td>Assessment Method Category: Oral exam</td>
<td>Criterion: 95% of all students will successfully complete their thesis and successfully defend their applied and theoretical knowledge of Plant and Soil Science</td>
<td>Action Status: Action In Progress</td>
<td>Action Status: Action In Progress</td>
</tr>
</tbody>
</table>

**Degree Program - CASNR - Plant and Soil Science (MS) - Methodological Research Expertise and Critical Thinking**

Students will demonstrate the use of critical thinking in the field of Plant and Soil Science and be able to defend their research projects critically. Students will successfully complete their thesis project and successfully defend their applied and theoretical knowledge of Horticultural science at their oral exam.

**Assessment Method Category: Oral exam**

Criterion: 95% of all students will successfully complete their thesis research and defend their field of applied and theoretical knowledge of Plant and Soil Science.

**Related Documents:**
- GradStudent.EnrollmentNumbers.2008t to Present.xlsx
- GradStudent Refereed Journals 2014-15.docx
- GradStudent Faculty Book Chapters 2014-15.docx
- GradStudent Electronic Media 2014-15.docx
- GradStudent Abstracts&Proceedings 2014-15.docx
- GradStudent Refereed Journals 2014-15.docx

**Action Status:**
- Action In Progress
- Action In Progress
- Action In Progress
- Action In Progress
Student Learning Outcomes

<table>
<thead>
<tr>
<th>Course Level Assessment</th>
<th>Task</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Level Assessment</td>
<td>Task</td>
<td>Results</td>
<td>Action for Improvement &amp; Follow-Up</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start Date</th>
<th>08/25/2014</th>
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</thead>
<tbody>
<tr>
<td>Outcome Status</td>
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</table>

<table>
<thead>
<tr>
<th>Assessment Method Category</th>
<th>Criterion</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Course Level Assessment</td>
<td>Task</td>
<td>Results</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence of Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 05/20/2015 - All students (14 of 14) complete their thesis in 14-15.</td>
</tr>
<tr>
<td>- 05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings</td>
</tr>
</tbody>
</table>

**Follow-Up:** Evidence of Improvement

- 05/28/2015 - Five files document the actions for improvement this year. They are:
  - GradStudent EnrollName Dates 2008-Present.xlsx
  - GradStudent Abstracts & Proceedings 2014-15.docx
  - GradStudent Electronic Media 2014-15.docx
  - GradStudent Faculty Book Chapters 2014-15.docx
  - GradStudent Refereed Journals 2014-15.docx

- 06/22/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

**Related Documents:**
- GradStudent Info 2014-15.docx
- GradStudent Enrollment Numbers 2008-Present.xlsx
- GradStudent Abstracts & Proceedings 2014-15.docx
- GradStudent Electronic Media 2014-15.docx
- GradStudent Faculty Book Chapters 2014-15.docx
- GradStudent Refereed Journals 2014-15.docx
Student Learning Outcomes

Assessment Method Category: Course Level Assessment

Criterion:
95% of all students will successfully present a comprehensive oral exam in the field of Plant and Soil Science

Result Type: Criterion Met
Action Status: Action In Progress

Related Documents:
GradStudent Info 2014-15.docx

Action in Progress
Criterion:
70% of all students will successfully present a comprehensive oral exam in the field of Plant and Soil Science

Result Type: Inconclusive
Action Status: Action In Progress

Related Documents:
GradStudent Info 2014-15.docx

Assessment Method Category: Course Level Assessment
Assessment Method:
Students will write scientific peer-review publications and submit abstract for oral presentation

Result Type: Inconclusive
Action Status: Action In Progress

Related Documents:
GradStudent Info 2014-15.docx

Action in Progress
Criterion:
No thesis master students will present a comprehensive oral exam in the field of Plant and Soil Science

Result Type: Inconclusive
Action Status: Action In Progress

Related Documents:
GradStudent Info 2014-15.docx

Assessment Method Category: Course Level Assessment
Assessment Method:
Non-thesis master students will complete their non-thesis in 14-15.

Result Type: Inconclusive
Action Status: Action In Progress

Related Documents:
GradStudent Info 2014-15.docx

Assessment Method Category: Course Level Assessment
Assessment Method:
Non-thesis master students will complete their non-thesis in 14-15.

Result Type: Inconclusive
Action Status: Action In Progress

Related Documents:
GradStudent Info 2014-15.docx
<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up: Evidence of Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree Program - CASNR - Plant and Soil Science (MS)</strong></td>
<td><strong>Ability to design experiments and analyze data</strong></td>
<td><strong>Students will demonstrate their ability to design experimental plan for their research and analyze data generated</strong></td>
<td><strong>Action for Improvement &amp; Follow-Up: Evidence of Improvement</strong></td>
</tr>
<tr>
<td><strong>Outcome Types:</strong></td>
<td><strong>Student Learning</strong></td>
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<tr>
<td><strong>Start Date:</strong></td>
<td><strong>08/25/2014</strong></td>
<td><strong>Active</strong></td>
<td><strong>95% of students will successfully defend their thesis in their field of Plant and Soil Science.</strong></td>
</tr>
<tr>
<td><strong>Assessment Method:</strong></td>
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<td><strong>Action in Progress</strong></td>
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<tr>
<td><strong>Assessment Method Category:</strong></td>
<td><strong>Master's Comprehensive Exam</strong></td>
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<tr>
<td><strong>Criterion:</strong></td>
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<td><strong>Follow-Up:</strong></td>
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<tr>
<td><strong>Follow-Up: Evidence of Improvement</strong></td>
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</table>
Assessment Method Category: Master's Comprehensive Exam

Criterion: 95% of students will successfully defend their thesis in their field of Plant and Soil Science.

05/28/2015 - Five files document the actions for improvement this year. They are:
(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx
(3) GradStudent Electronic Media 2014-15.docx
(4) GradStudent Book Chapters 2014-15.docx
(5) GradStudent Refereed Journals 2014-15.docx

Assessment Method: Students will defend their individual project and general knowledge in the field of Plant and Soil Science.

Assessment Method Category: Master's Comprehensive Exam

Criterion: 95% of students will successfully defend their thesis in their field of Plant and Soil Science.

06/23/2015 - All students (14 of 14) successfully defended their individual project and general knowledge in the field of Plant and Soil Science.

Result Type: Criterion Met

Action Status: Action In Progress

Related Documents:
### Student Learning Outcomes

#### Means of Assessment & Criteria / Tasks

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
<th>Related Documents</th>
</tr>
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</table>

#### Results

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
<th>Related Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/28/2015 - Increase the number of oral presentations (TTU, Regional, National)</td>
<td>Follow-Up</td>
<td>Evidence of Improvement: Five files document the actions for improvement this year. They are: (1) GradStudent.progression 01/11/2015, (2) GradStudent.progression 02/09/2015, (3) GradStudent.progression 03/01/2015, (4) GradStudent.progression 03/25/2015, (5) GradStudent.progression 04/09/2015</td>
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#### Action for Improvement & Follow-Up: Evidence of Improvement

<table>
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<tr>
<th>Action</th>
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<th>Related Documents</th>
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<tbody>
<tr>
<td>05/28/2015 - Increase the number of oral presentations (TTU, Regional, National)</td>
<td>Follow-Up</td>
<td>Evidence of Improvement: Five files document the actions for improvement this year. They are: (1) GradStudent.progression 01/11/2015, (2) GradStudent.progression 02/09/2015, (3) GradStudent.progression 03/01/2015, (4) GradStudent.progression 03/25/2015, (5) GradStudent.progression 04/09/2015</td>
</tr>
</tbody>
</table>

### Degree Program - CASNR - Plant and Soil Science (MS) - Develop Communication Skills - Students will demonstrate their ability to communicate in oral form appropriate for a career in Plant and Soil Science

#### Outcome Types:

- Student Learning Outcome

#### Outcome Details:

- **Start Date:** 08/25/2014
- **Outcome Status:** Active

#### Assessment Method:

- Students will be able to present their thesis research in an oral presentation in seminar (PSS 5100)

#### Assessment Method Category:

- Course Level Assessment

#### Criterion:

- 95% of students will successfully present their thesis research in an oral presentation

#### Result Type:

- Criterion Met

#### Action Status:

- Action In Progress

### Related Documents:

- GradStudent.EnrollmentNumbers.2008t to Present.xlsx
- GradStudent.ElectronicMedia 2014-15.docx
- GradStudent.FacultyBookChapters 2014-15.docx
- GradStudent.ReferencedJournals 2014-15.docx

### GradStudent Info 2014-15.docx

- 11/05/2015 1:58 PM Generated by TracData a product of Nuventive.
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Follow-Up: Evidence of Improvement:

- 05/28/2015 - Increase the attendance and participation in field days
- 11/05/2015 - Increase the attendance and participation in field days

Follow-Up: Evidence of Improvement:

- 05/28/2015 - Five files document the actions for improvement this year.
- (1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- (4) GradStudent.Book Chapters.2014-15.docx

Follow-Up: Evidence of Improvement:

- 05/28/2015 - Five files document the actions for improvement this year.
- (1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- (4) GradStudent.Book Chapters.2014-15.docx
<table>
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<tr>
<th>Action Status</th>
<th>Assessment Method Category</th>
<th>Assessment Method</th>
<th>Criteria</th>
<th>Result Type</th>
<th>Action Status</th>
<th>Related Documents</th>
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<tbody>
<tr>
<td>Inconclusive</td>
<td>Course Level Assessment</td>
<td>Grading on final examination in seminar (PSS 5100)</td>
<td>95% of students will successfully present their research in an oral presentation</td>
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<td>Inconclusive</td>
<td>GradStudent.EnrollmentNumbers.2008toPresent.xlsx</td>
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<tr>
<td>Inconclusive</td>
<td>Course Level Assessment</td>
<td>Students will present in industry fields day organized by the department</td>
<td>95% of students will successfully present their research in an oral presentation in seminar and at conference</td>
<td>Inconclusive</td>
<td>Inconclusive</td>
<td>GradStudent.EnrollmentNumbers.2008toPresent.xlsx</td>
</tr>
<tr>
<td>Inconclusive</td>
<td>Course Level Assessment</td>
<td>Students will present posters and make oral presentation in conference</td>
<td>95% of all students will present posters and make oral presentation in conference</td>
<td>Inconclusive</td>
<td>Inconclusive</td>
<td>GradStudent.EnrollmentNumbers.2008toPresent.xlsx</td>
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<th>Evidence of Improvement</th>
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<tbody>
<tr>
<td></td>
<td>Assessment Method: Grading on final examination in seminar (PSS 5100)</td>
<td>Evidence of Improvement</td>
<td>Follow-Up</td>
</tr>
<tr>
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<td>Assessment Method: Students will present in industry fields day organized by the department</td>
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<td>Follow-Up</td>
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<tr>
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<td>Assessment Method: Students will present posters and make oral presentation in conference</td>
<td>Evidence of Improvement</td>
<td>Follow-Up</td>
</tr>
</tbody>
</table>

06/23/2015 - All students (14 of 14) successfully presented their research in seminar.

Results to be added January 31, 2016.

Action for Improvement:

(4) GradStudent Book Chapters 2014-15.docx
(5) GradStudent Refereed Journals 2014-15.docx

08/11/2015 - No assessment was performed for the summer

06/23/2015 - Increase the number of oral presentations (TTU, Regional, National).

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<table>
<thead>
<tr>
<th>Degree Program - CASNR - Plant and Soil Science (MS) - Applied and Theoretical Knowledge - Students will demonstrate applied and theoretical knowledge within their field of Plant and Soil Science.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome Types:</strong></td>
</tr>
<tr>
<td>Student Learning</td>
</tr>
<tr>
<td>Start Date: 08/19/2013</td>
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<tr>
<td>Outcome Status: Inactive</td>
</tr>
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</table>

**Assessment Method:** Students will write a thesis as evidence of applied and theoretical knowledge in their field of Plant and Soil Science.

**Assessment Method Category:** Oral exam

**Criterion:** 95% of all students will successfully complete a thesis and defend their applied and theoretical knowledge in their field of Plant and Soil Science.

**Action Status:** Action In Progress


**Result Type:** Criterion Met

11/05/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings

Follow-Up: Evidence of Improvement:

05/28/2015 - Four files document the actions for improvements this year. They are: (1) Data -13-13.xlsx, (2) Graduate students publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013, (4) PSS MS Graduate Award 2013-14.pdf.
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement

Follow-Up: Evidence of Improvement:

05/28/2015 - Four files document the actions for improvements this year. They are: (1) Data -13-13.xlsx,
(2) Graduate students publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013,
(4) PSS MS Graduate Award 2-6-13.pdf

Follow-Up:

05/28/2015 - Four files document the actions for improvements this year.

They are: (1) Data -13-13.xlsx, (2) Graduate students publications abstracts and awards 2013.pdf,
(3) Narrative of continuous improvement Sept 2013,
(4) PSS MS Graduate Award 2-6-13.pdf

05/28/2015 - Increase the number of refereed publications with at least one graduate student listed as author or co-author.

Follow-Up:

05/28/2015 - Four files document the actions for improvements this year. They are: (1) Data -13-13.xlsx,
(2) Graduate students publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013,
(4) PSS MS Graduate Award 2-6-13.pdf

Follow-Up:

05/28/2015 - Increase the percentage of students receiving an award (TTU, Regional, National)

Follow-Up:

05/28/2015 - Four files document the actions for improvements this year. They are: (1) Data -13-13.xlsx,
(2) Graduate students publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013,
(4) PSS MS Graduate Award 2-6-13.pdf

Follow-Up:

05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings.

Follow-Up:

05/28/2015 - Four files document the actions for improvements this year. They are: (1) Data -13-13.xlsx,
(2) Graduate students publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013,
(4) PSS MS Graduate Award 2-6-13.pdf

Follow-Up:

05/28/2015 - Increase the percentage of students able to write successfully a defended thesis in their field of plant and soil science.

Follow-Up:

05/28/2015 - Four files document the actions for improvements this year. They are: (1) Data -13-13.xlsx,
(2) Graduate students publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013,
(4) PSS MS Graduate Award 2-6-13.pdf

Follow-Up:
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement

Follow-Up: Evidence of Improvement:

05/28/2015 - Four files document the actions for improvements this year. They are:
(1) Data -13-13.xlsx,
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(3) Narrative of continuous improvement Sept 2013,
(4) PSS MS Graduate Award 2-6-13.pdf

Degree Program - CASNR - Plant and Soil Science (MS) - Upper-level Communication - Students will demonstrate their ability to communicate in oral form appropriate for a career in Plant and Soil Science

Outcome Types:

Student Learning

Start Date: 08/26/2013
End Date: 08/25/2014
Outcome Status: Inactive

Assessment Method:
Students will be able to present their thesis research in an oral presentation (PSS 5100).

Assessment Method Category:
Course Level Assessment

Criterion:
95% of students will successfully present their thesis research in an oral presentation.

Criterion Met:
10/28/2014 - Sixteen students passed seminar in 13-14

Result Type:
Criterion Met

Action Status:
Action In Progress

Related Documents:
Data 2013-14
Graduate Student Enrollement 2013-14
Narrative continuous improvement 2013-14
PSS MS Graduate Award 2013-14
PSS State of the Department Fall 2014
PSS Recruitment Plan 2013-14
PSS Graduate Handbook 2013-14
PSS Graduate Student Flyer 2013-14
Graduate Student Abst. & Proc. 2013-14
Graduate Student Publications 2013-14

05/28/2015 - Increase the attendance and participation in field days
05/28/2015 - Increase the number of students enrolled
05/28/2015 - Increase the attendance
05/28/2015 - Increase the number of students passed seminar in 13-14
10/28/2014 - Sixteen students passed seminar in 13-14
### Purpose Statement:
The College of Agriculture and Science and Natural Resources is dedicated to providing programs of excellence in teaching, research, and outreach. These educational programs are designed to prepare the student for the dynamic agricultural and renewable natural resources industry—an industry that encompasses five closely related segments: (1) producing agricultural products; (2) supplying agricultural chemical, feed, seed, and other production resources; (3) processing, storing, distributing, and other marketing functions for agricultural products; (4) planning and managing programs for renewable natural resources; and (5) providing technical assistance, training, services, education, research, and communications in all sectors of the food, feed, fiber, and natural resource industries. In addition, the cornerstone is the provision of excellent undergraduate education and research facilities and resources.

### Student Learning Outcomes

<table>
<thead>
<tr>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Degree Program - CASNR - Plant and Soil Science (PHD) Develop an understanding of both theoretical and applied principles of Plant and Soil Science</td>
<td>Students will develop and demonstrate a theoretical and applied knowledge of Plant and Soil Science</td>
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<td>Assessment Method</td>
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<td>Outcome Status: Active</td>
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<td>Start Date: 08/25/2014</td>
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<td>Outcome Status: Active</td>
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<td>Start Date: 08/25/2014</td>
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<td>Action Status: Action In Progress</td>
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</tbody>
</table>

### Evidence of Improvement

- 06/22/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.
- 05/20/2015 - All students (8 of 8) successfully defended their dissertation. Results to be added January 31, 2016.
<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) GradStudent EnrollmentNumbers.2008toPresent.xlsx</td>
<td>2014-15.docx</td>
<td>GradStudent Book Chapters 2014-15.docx</td>
<td>Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings.</td>
</tr>
<tr>
<td>(3) GradStudent Electronic Media 2014-15.docx</td>
<td>15-120.00</td>
<td>GradStudent Refereed Journals 2014-15.docx</td>
<td>Increase the percentage of students receiving an award (TTU, Regional, National).</td>
</tr>
<tr>
<td>(5) GradStudent Refereed Journals 2014-15.docx</td>
<td>15-120.00</td>
<td>GradStudent Refereed Journals 2014-15.docx</td>
<td>05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings.</td>
</tr>
<tr>
<td></td>
<td>2014-15.docx</td>
<td>GradStudent Refereed Journals 2014-15.docx</td>
<td>05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings.</td>
</tr>
</tbody>
</table>
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Evidence of Improvement

Follow-Up: Evidence of Improvement:

2014-15.docx

Assessment Method:
Develop relevant literature review of the research project

Assessment Method Category:
Course Level Assessment

Criterion:
95% of all students will develop relevant literature review of the research project

08/11/2015 - No assessment was performed for the summer

Result Type:
Inconclusive

Action Status:
Action In Progress

06/23/2015 - All students (8 of 8) successfully developed literature review relevant to their research projects

Result Type:
Criterion Met

Action Status:
Action In Progress

06/23/2015 - Increase the number of students developing relevant literature review of their research projects

Assessment Method:
Students will write peer-review papers in refereed journals

Assessment Method Category:
Course Level Assessment

Criterion:
95% of all students will write at least 2 peer-review papers in refereed journals

08/11/2015 - No assessment was performed for the summer

Result Type:
Inconclusive

Action Status:
Action In Progress

06/23/2015 - 22 doctoral students generate peer-review papers.

3 doctoral students generated 1 book chapter.

Result Type:
Criterion Met

Action Status:
Action In Progress

06/23/2015 - Increase the number of peer-review publications generated by doctoral students

Related Documents:
GradStudent.EnrollmentNumbers.2008t0Present.xlsx
GradStudent Abstracts&Proceedings 2014-15.docx
GradStudent Electronic Media 2014-15.docx
GradStudent Book Chapters 2014-15.docx
GradStudent Refereed Journals 2014-15.docx
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Follow-Up: Evidence of Improvement

05/28/2015 - Five files document the actions for improvement this year. They are:
(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx,
(2) GradStudent.Abschluss.Fragen.2015,
(3) GradStudent.Book.Chapters.2014-2015,
(4) GradStudent.Electronic.Media.2014,

Follow-Up: Evidence of Improvement

05/28/2015 - Increase the percentage of students ability to write successfully a publication for submission to a referee journal.

Follow-Up: Evidence of Improvement

05/28/2015 - Increase the percentage of students receiving an award (TTU, Regional, National).

Follow-Up: Evidence of Improvement

08/11/2015 - No assessment was performed for the summer.

Follow-Up: Evidence of Improvement

05/28/2015 - All students (8 of 8) presented their dissertation. Results to be added January 31, 2016.

Follow-Up: Evidence of Improvement

06/22/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

Follow-Up: Evidence of Improvement

05/28/2015 - Five files document the actions for improvement this year. They are:
(1) GradStudent.EnrollmentNumbers.2008toPresent.xlsx,
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Follow-Up: Evidence of Improvement

05/28/2015 - Increase the percentage of students receiving an award (TTU, Regional, National).

Follow-Up: Evidence of Improvement

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(3) GradStudent.Book.Chapters.2014-2015,
(4) GradStudent.Electronic.Media.2014,

Follow-Up: Evidence of Improvement

05/28/2015 - Increase the percentage of students receiving an award (TTU, Regional, National).
Assessment Method:
Students will write scientific peer-review publications and submit abstracts for oral presentation.

Assessment Method Category:
Course Level Assessment

Criterion:
95% of all students will write peer-review publications and submit abstracts for oral presentation.

05/28/2015 - Five files document the actions for improvement this year. They are:
1. GradStudent.EnrollmentNumbers.2010toPresent.xlsx
4. GradStudent Book Chapters 2014-15.docx
5. GradStudent Refereed Journals 2014-15.docx

Follow-Up: Evidence of Improvement:
05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings.

06/23/2015 - 22 peer-review publications were generated by doctoral students.
52 external presentations were made by doctoral students.

Result Type: Criterion Met
Action Status: Action In Progress

08/11/2015 - No assessment was performed for the summer.

Result Type: Inconclusive
Action Status: Action In Progress

Related Documents:
GradStudent Refereed Journals 2014-15.docx

06/23/2015 - Increase the number of doctoral students generating peer-review publications and presenting external presentations.

Follow-Up: Evidence of Improvement:
11/05/2015 2:01 PM - No assessment was performed for the summer.

Related Documents:
GradStudent Refereed Journals 2014-15.docx

Follow-Up: Evidence of Improvement:
05/28/2015 - Five files document the actions for improvement this year. They are:
1. GradStudent.EnrollmentNumbers.2010toPresent.xlsx
4. GradStudent Book Chapters 2014-15.docx
5. GradStudent Refereed Journals 2014-15.docx

06/23/2015 - 22 peer-review publications were generated by doctoral students.
52 external presentations were made by doctoral students.

Result Type: Criterion Met
Action Status: Action In Progress

08/11/2015 - No assessment was performed for the summer.

Result Type: Inconclusive
Action Status: Action In Progress

Related Documents:
GradStudent Refereed Journals 2014-15.docx

Follow-Up: Evidence of Improvement:
11/05/2015 2:01 PM - No assessment was performed for the summer.

Related Documents:
GradStudent Refereed Journals 2014-15.docx
<table>
<thead>
<tr>
<th>Outcome Learning Outcome</th>
<th>Means of Assessment &amp; Criteria / Tasks</th>
<th>Results</th>
<th>Action for Improvement &amp; Follow-Up: Evidence of Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will defend their individual project and general knowledge in the field of Plant and Soil Science</td>
<td>Qualifying Exam</td>
<td>95% of students will successfully defend their individual project and general knowledge in the field of Plant and Soil Science</td>
<td>08/11/2015 - No assessment was performed for the summer</td>
</tr>
<tr>
<td>06/23/2015 - All students (8 of 8) defended their individual project (qualifying exam).</td>
<td></td>
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<td>Result Type: Criterion Met</td>
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<tr>
<td>05/20/2015 - All students (8 of 8) successfully passed their qualifying exams and successfully defended their dissertation.</td>
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<td>Action Status: Action In Progress</td>
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<td>05/28/2015 - Increase the percentage of students able to write successfully an abstract for submission to a conference</td>
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<td>Follow-Up: Evidence of Improvement: 5 files document the actions for improvement this year</td>
</tr>
</tbody>
</table>
| 11/05/2015 2:01 PM | Generated by TracData a product of Nuventive.
Means of Assessment & Criteria / Tasks

Assessment Method: Develop experimental design to conduct research project

Action: In Progress

Results:
95% of all students will develop experimental design to conduct research projects.

Assessment Method Category: Course Level Assessment

Criterion:
95% of all students will develop experimental design to conduct research projects.

08/11/2015 - No assessment was performed for the summer term.

Follow-Up:

06/23/2015 - All students (8 of 8) successfully developed experimental design to conduct research projects.

05/28/2015 - Five files document the actions for improvement this year. They are:
1. GradStudent.EnrollmentNumbers.2010toPresent.xlsx
4. GradStudent Book Chapters 2014-15.docx
5. GradStudent Refereed Journals 2014-15.docx

05/28/2015 - Increase the percentage of students receiving an award (TTU, Regional, National)

Follow-Up:

05/28/2015 - Five files document the actions for improvement this year. They are:
1. GradStudent.EnrollmentNumbers.2010toPresent.xlsx
4. GradStudent Book Chapters 2014-15.docx
5. GradStudent Refereed Journals 2014-15.docx

Assessment Method:
Develop experimental design to conduct research project

Action: In Progress

08/11/2015 - No assessment was performed for the summer term.
Degree Program - CASNR - Plant and Soil Science (PHD) - Develop Communication Skills - Students will communicate in oral form appropriate for research level position in Plant and Soil Science

**Outcome Start Date:** 08/25/2014

**Outcome Status:** Assess

**Assessment Method:** Students will present their thesis research in PSS 5100 seminar

**Assessment Method Category:** Course Level Assessment

**Criterion:** 95% of students will pass PSS 5100 seminar

**Result Type:** Criterion Met

**Result:** 05/20/2015 - All students (8 of 8) passed PSS 5100 seminar.

**Action for Improvement & Follow-Up:**

**Evidence of Improvement**

**Result Type:** Inconclusive

**Action Status:** Action In Progress

05/20/2015 - Al students (8 of 8) passed PSS 5100 seminar.

**Related Documents:**
- GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- GradStudent.BookChapters.2014-15.docx

---

**Student Learning Outcomes**

**Means of Assessment & Criteria / Tasks**

05/28/2015 - Increase the attendance and participation in field days.

**Result Type:** Criterion Met

**Result:** 05/28/2015 - Increase the attendance and participation in field days.

**Action for Improvement & Follow-Up:**

**Evidence of Improvement**

**Result Type:** Criterion Met

**Result:** 05/28/2015 - Increase the attendance and participation in field days.

---

**Student Learning Outcomes**

**Means of Assessment & Criteria / Tasks**

05/28/2015 - Increase the number of doctoral students developing experimental design to conduct research.

**Result Type:** Criterion Met

**Result:** 05/28/2015 - Increase the number of doctoral students developing experimental design to conduct research.

**Action for Improvement & Follow-Up:**

**Evidence of Improvement**

**Result Type:** Inconclusive

**Action Status:** Action In Progress

05/20/2015 - Al students (8 of 8) successfully developed experimental design to conduct research.

**Related Documents:**
- GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- GradStudent.BookChapters.2014-15.docx

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**Student Learning Outcomes**

**Means of Assessment & Criteria / Tasks**

05/28/2015 - Increase the number of doctoral students developing experimental means to analyze data produced in the research project.

**Result Type:** Criterion Met

**Result:** 05/28/2015 - Increase the number of doctoral students developing experimental means to analyze data produced in the research project.

**Action for Improvement & Follow-Up:**

**Evidence of Improvement**

**Result Type:** Criterion Met

**Result:** 05/28/2015 - Increase the number of doctoral students developing experimental means to analyze data produced in the research project.

**Related Documents:**
- GradStudent.EnrollmentNumbers.2008toPresent.xlsx
- GradStudent.BookChapters.2014-15.docx
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Follow-Up: Evidence of Improvement for 05/28/2015:

1. Increase the number of oral presentations (TTU, Regional, National)

Follow-Up: Evidence of Improvement for 11/05/2015:

1. Increase the attendance and participation in producers meetings (11/05/2015)
Student Learning Outcomes

Assessment Method:

Students will present posters and make oral presentations in conferences.

Assessment Method Category:

Course Level Assessment

Criterion:

95% of all students will present posters and make oral presentations in conferences.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - 52 external presentations were made by doctoral students.

Result Type:

Criterion Met

Action Status:

Action In Progress

06/23/2015 - Results to be added January 31, 2016.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

Related Documents:

GradStudent Abstracts & Proceedings 2014-15.docx

GradStudent Electronic Media 2014-15.docx

GradStudent Book Chapters 2014-15.docx

GradStudent Refereed Journals 2014-15.docx

Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

Assessment Types:

Criterion:

95% of all students will participate and present their research in industry field day organized by the department.

Action Status:

Action In Progress

06/23/2015 - Results to be added January 31, 2016.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

Related Documents:

GradStudent Abstracts & Proceedings 2014-15.docx

GradStudent Electronic Media 2014-15.docx

GradStudent Book Chapters 2014-15.docx

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Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

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Action Status:

Action In Progress

06/23/2015 - Results to be added January 31, 2016.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

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GradStudent Electronic Media 2014-15.docx

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Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

Assessment Types:

Criterion:

95% of all students will participate and present their research in industry field day organized by the department.

Action Status:

Action In Progress

06/23/2015 - Results to be added January 31, 2016.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

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Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

Assessment Types:

Criterion:

95% of all students will participate and present their research in industry field day organized by the department.

Action Status:

Action In Progress

06/23/2015 - Results to be added January 31, 2016.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

Related Documents:

GradStudent Abstracts & Proceedings 2014-15.docx

GradStudent Electronic Media 2014-15.docx

GradStudent Book Chapters 2014-15.docx

GradStudent Refereed Journals 2014-15.docx

Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

Assessment Types:

Criterion:

95% of all students will participate and present their research in industry field day organized by the department.

Action Status:

Action In Progress

06/23/2015 - Results to be added January 31, 2016.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

Related Documents:

GradStudent Abstracts & Proceedings 2014-15.docx

GradStudent Electronic Media 2014-15.docx

GradStudent Book Chapters 2014-15.docx

GradStudent Refereed Journals 2014-15.docx

Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

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Result Type:

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Action Status:

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Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.

Assessment Types:

Criterion:

95% of all students will participate and present their research in industry field day organized by the department.

Action Status:

Action In Progress

06/23/2015 - Results to be added January 31, 2016.

Result Type:

Inconclusive

Action Status:

Action In Progress

06/23/2015 - Given our program's newly revised assessment plan, our program is currently awaiting the end of the fall and spring semesters to analyze new data and formulate an action plan based on the new data.

Related Documents:

GradStudent Abstracts & Proceedings 2014-15.docx

GradStudent Electronic Media 2014-15.docx

GradStudent Book Chapters 2014-15.docx

GradStudent Refereed Journals 2014-15.docx

Degree Program - CASNR - Plant and Soil Science (PHD) - Knowledge - Students will demonstrate a basic understanding of their field of study.
95% of the students will write an acceptable dissertation.

All students (6 of 6) wrote an acceptable dissertation in 2010-11.

All students (8 of 8) wrote an acceptable dissertation in 2011-12.

All students (5 of 5) wrote an acceptable dissertation in 2012-13.

All students (5 of 5) wrote an acceptable dissertation in 2013-14.

Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-14.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2013.pdf, and (5) PSS PhD Graduate Award 2013.pdf.

09/26/2013 - Increase the percentage of students receiving an award (TTU, regional, national).

Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-14.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2013.pdf, and (5) PSS PhD Graduate Award 2013.pdf.

09/26/2013 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings (Criteria: The major professor approved the submission).

Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-14.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2013.pdf, and (5) PSS PhD Graduate Award 2013.pdf.
<table>
<thead>
<tr>
<th>Degree Program - CASNR - Plant and Soil Science (PHD) - Communication - Students will communicate in oral form appropriate for their area of specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Learning Outcomes</strong></td>
</tr>
<tr>
<td><strong>Means of Assessment &amp; Criteria / Tasks</strong></td>
</tr>
<tr>
<td><strong>Results</strong></td>
</tr>
<tr>
<td><strong>Action for Improvement &amp; Follow-Up:</strong></td>
</tr>
</tbody>
</table>

**Evidence of Improvement**

09/26/2013 - Increase the percentage of students able to write successfully a publication for submission to a conference with proceedings (Criteria: the student major professor approved the submission).

**Follow-Up:** Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2-6-13.pdf, and (5) PSS PhD Graduate Award 2-6-13.pdf.

---

**Assessment Method:**

Students will present their dissertation research in an oral presentation in seminar (PSS 5100).

**Assessment Method Category:**

Course Level Assessment

**Criterion:**

95% of students will pass seminar (PSS 5100).

10/28/2014 - All students (10 of 10) passed seminar in 06-07.

All students (7 of 7) passed seminar in 07-08.

All students (2 of 2) passed seminar in 08-09.

Two students (2 of 9) passed seminar in 09-10. Seminar was cancelled in Spring 10.

All students (8 of 8) passed seminar in 10-11.

All students (11 of 11) passed seminar in 11-12.

All students (5 of 5) passed seminar in 09-10. Seminar was cancelled in 09-10.

All students (7 of 7) passed seminar in 07-08. Two students (2 of 9) passed seminar in 08-09.

10/28/2014 - All students (10 of 10) passed seminar in 06-07.

**Result Type:** Criterion Met

**Action Status:** Action In Progress

**Related Documents:**

Data_10-11.xlsx

2010 Student publications.docx

Narrative of continuous improvement Sept 2011.docx

Data_11-12.xlsx

Narrative of continuous improvement Sept 2012.docx

Graduate Student Publications Abstracts and Awards 2012.pdf

Data_12-13.xlsx

Graduate Student Publications Abstracts and Awards 2013.pdf

Narrative of continuous improvement Sept 2013.pdf

---

09/26/2013 - Increase the attendance and participation in field days.

**Follow-Up:** Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2-6-13.pdf, and (5) PSS PhD Graduate Award 2-6-13.pdf.

**Assessment Method:**

Students will present their dissertation research in an oral presentation in seminar (PSS 5100).

**Assessment Method Category:**

Course Level Assessment

**Criterion:**

Students will present their dissertation research in an oral presentation in seminar (PSS 5100).

Performance in Progress

**Action Status:**

Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2-6-13.pdf, and (5) PSS PhD Graduate Award 2-6-13.pdf.
Student Learning Outcomes

Degree Program - CASNR - Plant and Soil Science (PHD) - Critical thinking - Students will demonstrate the use of critical thinking to identify problems and derive conclusions in a complex global society.

Outcome Types:

- Student Learning

Start Date: 02/01/2006
End Date: 05/20/2015
Outcome Status: Inactive

Assessment Method:
Students will defend their dissertation within their field of study.

Assessment Method Category: Dissertation

Criterion: 95% of the students will successfully pass their dissertation defense.

10/28/2014 - All students (2 of 2) successfully defended their dissertation in 06-07.
10/28/2014 - All students (4 of 4) successfully defended their dissertation in 07-08.
10/28/2014 - All students (2 of 2) successfully defended their dissertation in 08-09.
10/28/2014 - All students (9 of 9) successfully defended their dissertation in 09-10.
10/28/2014 - All students (6 of 6) successfully defended their dissertation in 10-11.
10/28/2014 - All students (8 of 8) successfully defended their dissertation in 11-12.
10/28/2014 - All students (5 of 5) successfully defended their dissertation in 13-14.

Result Type: Criterion Met
Action Status: Action In Progress

Related Documents:
- Narrative student learning outcome 2010.docx
- 2010 Student publications.docx
- Data_10-11.xlsx
- Data_11-12.xlsx
- Graduate Student Publications Abstracts and Awards 2013.pdf
- Graduate Student Publications Abstracts and Awards 2014.pdf
- Narrative of continuous improvement Sept 2013.pdf
- PSS MS Graduate Award 2-6-13.pdf
- PSS PhD Graduate Award 2-6-13.pdf

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the number of oral presentations (TTU, regional, national).

Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are:
1. Data-13-13.xlsx
2. Graduate student publications abstracts and awards 2013.pdf
3. Narrative of continuous improvement Sept 2013.pdf
4. PSS MS Graduate Award 2-6-13.pdf
5. PSS PhD Graduate Award 2-6-13.pdf

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the number of patents or plant registrations with at least one graduate student listed as inventor or co-inventor.

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the number of research awards received (TTU, regional, national).

Follow-Up: Evidence of Improvement:

09/25/2012 - Three files document the actions for improvement this year. They are:
1. Data-11-12.xlsx
2. Graduate student publications abstracts and awards 2013.pdf
3. Narrative of continuous improvement Sept 2013.pdf

Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are:
1. Data-13-13.xlsx
2. Graduate student publications abstracts and awards 2013.pdf
3. Narrative of continuous improvement Sept 2013.pdf
4. PSS MS Graduate Award 2-6-13.pdf
5. PSS PhD Graduate Award 2-6-13.pdf
Student Learning Outcomes

Means of Assessment & Criteria / Tasks

Results

Action for Improvement & Follow-Up:

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings (Criteria: The major professor approved the submission).

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the percentage of students able to write successfully a publication for submission to a referee journal (Criteria: the student major professor approved the submission).

Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013-14.pdf, (3) Narrative of continuous improvement Sept 2012.pdf, (4) PSS MS Graduate Award 2-6-13.pdf and (5) PSS PhD Graduate Award 2-6-13.

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the percentage of students able to write successfully an abstract for submission to a conference with proceedings (Criteria: The major professor approved the submission).

Follow-Up: Evidence of Improvement:

09/26/2013 - Five files document the actions for improvement this year. They are: (1) Data-13-13.xlsx, (2) Graduate student publications abstracts and awards 2013-14.pdf, (3) Narrative of continuous improvement Sept 2013.pdf, (4) PSS MS Graduate Award 2-6-13.pdf and (5) PSS PhD Graduate Award 2-6-13.

Follow-Up: Evidence of Improvement:

09/26/2013 - Increase the percentage of students able to write successfully a publication for submission to a referee journal (Criteria: the student major professor approved the submission).
09/26/2013 - Five files document the actions for improvement this year. They are:
1. Data-13-13.xlsx
2. Graduate student publications abstracts and awards 2013.pdf
3. Narrative of continuous improvement Sept 2013. pdf
4. PSS MS Graduate Award 2-6-13.pdf
5. PSS PhD Graduate Award 2-6-13.pdf

11/05/2015 2:01 PM Generated by TracDat a product of Nuventive.
APPENDIX J

COURSES CROSS LISTED (TANDEM)
INSTRUCTOR: Scott Longing, Ph.D.
OFFICE: 207 Agricultural Sciences
OFFICE HOURS: Monday afternoon, 1:00-3:00pm or other times by appointment
LECTURES: MWF 10:00 – 10:50 a.m., 206 Food Technology.


COURSE DESCRIPTION This course will explore several key and important aspects of pesticides – what they are, what they do, and how to use them effectively, safely and economically. The course is divided into four sections, each containing several lectures: (I) Introduction to Agricultural Compounds and Pesticides (II) Pesticides: Classes and Modes of Action, (III) Calibration and Pest Management, and (IV) Selected Topics in Pest Management.

COURSE PURPOSE The purpose of this course is to introduce students to pesticides in the context of integrated pest management (IPM), human and environmental toxicity, and emerging technologies. Students should gain an understanding of how agricultural compounds are used to control pests.

EXPECTED LEARNING OUTCOMES
- Understand the past and present use of pesticides
- Understand the categories and modes of actions of major pesticide groups
- Understand the importance of integrated pest management principles
- Solve pesticide calibration problems
- Understand the relationships of biodiversity, pest management and agricultural production
- Understand some emerging concepts in pesticide development

METHODS FOR ASSESSING THE EXPECTED LEARNING OUTCOMES
Assessments will involve four exams, a final exam, 14 article summaries, and a student term paper. One exam will be given at the end of each section I – IV. The final exam will be comprehensive and given on May 12th, 1:30 - 4:00 p.m.

GRADING A total of 790 points will be possible for the course (four, 100 point lecture exams, a 150 point final exam, 140 points for article summaries, and a 100 point term paper). Course grades will be given as A = 90%, B = 80%, C = 70%, etc. of the point total. Exams are expected to be taken at the scheduled time. If there
is any reason why you cannot take an exam during the scheduled time, you should discuss the reason with the instructor before the exam to plan accordingly.

**CLASSROOM CONDUCT**

Students are expected to assist in maintaining a classroom environment that is conducive to learning. Please SILENCE and DO NOT USE phones in class.

**ACADEMIC REGULATIONS:** Please refer to the 2013-2014 Texas Tech University Undergraduate and Graduate Catalog for a complete list of “Academic Regulations.”

**Students with Disabilities:** Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.

**Academic Integrity:** It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.

**Student Resolution Center:** The Student Resolution Center is available to assist students with any conflict or problem that has to do with being a student at Texas Tech University. You may visit the Center in 202 Student Union Building or call 742-4791.

**Reporting Illness:** In case of illness that will require absence from class for more than one week, the student should notify his or her academic dean. The dean’s office will inform the student’s instructors through the departmental office. In case of class absences because of a brief illness, the student should inform the instructor directly. Other information related to illness is found in the Student Handbook and the Residence Halls Handbook.

**Absence Due to Religious Observance:** The Texas Tech University Catalog states that a student who is absent from classes for the observance of a religious holiday will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after their absence.

**Absence Due to Officially Approved Trips:** Absence due to officially approved trips – The Texas Tech University Catalog states that the person responsible for a student missing class due to a trip should notify the instructors of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missed.
## Lecture Schedule:

<table>
<thead>
<tr>
<th>Lecture Period</th>
<th>Date</th>
<th>Lecture topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Section I: Introduction to Agricultural Compounds</strong></td>
</tr>
<tr>
<td>1</td>
<td>15-Jan</td>
<td>Introduction</td>
</tr>
<tr>
<td>2</td>
<td>17-Jan</td>
<td>Pesticides, Transgenics and IPM</td>
</tr>
<tr>
<td></td>
<td>20-Jan</td>
<td>NO CLASS</td>
</tr>
<tr>
<td>3</td>
<td>22-Jan</td>
<td>Pesticides Use and Naming</td>
</tr>
<tr>
<td>4</td>
<td>24-Jan</td>
<td>Student-Led Discussion - Article Group 1</td>
</tr>
<tr>
<td>5</td>
<td>27-Jan</td>
<td>Chemistry and Formulations</td>
</tr>
<tr>
<td>6</td>
<td>29-Jan</td>
<td>Toxicity and Poisoning</td>
</tr>
<tr>
<td>7</td>
<td>31-Jan</td>
<td>Handling, Regulations and Labelling</td>
</tr>
<tr>
<td>8</td>
<td>3-Feb</td>
<td>EXAM 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Section II: Pesticides: Classes and Modes of Action</strong></td>
</tr>
<tr>
<td>9</td>
<td>5-Feb</td>
<td>Insecticide Classification</td>
</tr>
<tr>
<td>10</td>
<td>7-Feb</td>
<td>Insecticide Modes of Action</td>
</tr>
<tr>
<td>11</td>
<td>10-Feb</td>
<td>Student-Led Discussion - Article Group 2</td>
</tr>
<tr>
<td>12</td>
<td>12-Feb</td>
<td>Insecticide Modes of Action</td>
</tr>
<tr>
<td>13</td>
<td>14-Feb</td>
<td>Molluscidicides and Nematicides</td>
</tr>
<tr>
<td>14</td>
<td>17-Feb</td>
<td>Rodenticides, Molluscidicides and Avicides</td>
</tr>
<tr>
<td>15</td>
<td>19-Feb</td>
<td>Piscicides and Repellents</td>
</tr>
<tr>
<td>16</td>
<td>21-Feb</td>
<td>Herbicides</td>
</tr>
<tr>
<td>17</td>
<td>24-Feb</td>
<td>Defoliants, Desiccants and PGRs (No Class - See PDF on Blackboard)</td>
</tr>
<tr>
<td>18</td>
<td>26-Feb</td>
<td>Fungicides and Bactericides (No Class - See PDF on Blackboard)</td>
</tr>
<tr>
<td>19</td>
<td>28-Feb</td>
<td>Student-Led Discussion - Article Group 3</td>
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<tr>
<td>20</td>
<td>3-Mar</td>
<td>EXAM 2</td>
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<tr>
<td></td>
<td></td>
<td><strong>Section III: Calibration and Pest Management</strong></td>
</tr>
<tr>
<td>21</td>
<td>5-Mar</td>
<td>Equipment, Spraying and Drift</td>
</tr>
<tr>
<td>22</td>
<td>7-Mar</td>
<td>Calibration</td>
</tr>
<tr>
<td>23</td>
<td>10-Mar</td>
<td>Calibration</td>
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<tr>
<td>24</td>
<td>12-Mar</td>
<td>Calibration</td>
</tr>
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<td>25</td>
<td>14-Mar</td>
<td>Student-Led Discussion - Article Group 4</td>
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<tr>
<td></td>
<td></td>
<td>SPRING BREAK - March 15th - 23rd</td>
</tr>
<tr>
<td>26</td>
<td>24-Mar</td>
<td>Greenhouse Pests and IPM</td>
</tr>
<tr>
<td>27</td>
<td>26-Mar</td>
<td>Pest Management in Organic Farming</td>
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<tr>
<td>28</td>
<td>28-Mar</td>
<td>Turfgrass Pests and IPM</td>
</tr>
<tr>
<td></td>
<td>31-Mar</td>
<td>NO CLASS</td>
</tr>
<tr>
<td>29</td>
<td>2-Apr</td>
<td>Cotton Pests and IPM</td>
</tr>
<tr>
<td>30</td>
<td>4-Apr</td>
<td>Student-Led Discussion - Article Group 5</td>
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<tr>
<td>31</td>
<td>7-Apr</td>
<td>EXAM 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Section IV: Selected Topics in Pest Management</strong></td>
</tr>
<tr>
<td>32</td>
<td>9-Apr</td>
<td>Biorationalls</td>
</tr>
<tr>
<td>33</td>
<td>11-Apr</td>
<td>Management of Resistance</td>
</tr>
<tr>
<td>34</td>
<td>14-Apr</td>
<td>Management of Resistance in Transgenics</td>
</tr>
<tr>
<td>35</td>
<td>16-Apr</td>
<td>Toxicity to Mammalian and Arthropod Non-Targets</td>
</tr>
<tr>
<td>36</td>
<td>18-Apr</td>
<td>Pesticide Use in Developing Countries - Use and Human Threats</td>
</tr>
<tr>
<td>37</td>
<td>21-Apr</td>
<td>Emerging Insects Pests</td>
</tr>
<tr>
<td>38</td>
<td>23-Apr</td>
<td>Student-Led Discussion - Article Group 6</td>
</tr>
<tr>
<td>39</td>
<td>25-Apr</td>
<td>Term Paper Presentations</td>
</tr>
<tr>
<td>40</td>
<td>28-Apr</td>
<td>Term Paper Presentations</td>
</tr>
<tr>
<td>41</td>
<td>30-Apr</td>
<td>Term Paper Presentations</td>
</tr>
<tr>
<td>42</td>
<td>2-May</td>
<td>EXAM 4</td>
</tr>
<tr>
<td>43</td>
<td>5-May</td>
<td>Wrap Up and Review for Final Exam</td>
</tr>
</tbody>
</table>

Final Exam: May 12, 2014, 1:30 - 4:00pm.
Plant and Soil Science 5312, Section D01
Vineyard Management
Syllabus, Spring 2015

Instructors: Dr. Edward Hellman
e-mail: ed.hellman@ttu.edu
Phone : 746-4038
Office: PS 260
Office Hours: By appointment

Course Description:
PSS 4310 Viticulture II – Grape Production. Prerequisite: PSS 3310 Viticulture I
Blackboard Lectures: 3/week
Online Discussion and Assignments

Course Purpose:
The purpose of our course is to enable the student to display knowledge of the application of viticultural principles to the commercial production of grapes. Students will gain knowledge of the practical aspects of establishing and operating a vineyard including site selection, vineyard design, variety and rootstock selection, planting, training, pruning, canopy management, irrigation, soil management, nutrition, pests, diseases, maturity monitoring, harvesting, and economics.

Required Text: Grape Grower's Handbook
Author: Ted Goldammer
Publisher: Apex Publishers
Publication Date: August 2013

Required Content Online (Blackboard)
Narrated Powerpoint presentations for lectures
Supplemental reading and websites
Assignments
Class Discussion

Learning Objectives
1. Students will demonstrate an understanding of the effects that physical characteristics (climate, soils etc.) of growing sites have upon grape production.
2. Students will demonstrate an understanding of the effects that vineyard management practices have upon yield and fruit quality.
3. Students will demonstrate the integration of viticultural knowledge to make decisions essential to vineyard management.

**Expected Learning Outcomes**

1. Students will demonstrate applied and theoretical knowledge within the field of Horticulture.
2. Students will demonstrate technical and professional skills needed to function within a complex and global society.

**Methods for Assessing Expected Learning Outcomes**

Learning outcomes will be assessed by:
1. Closed-book exams
2. Vineyard design project
3. Student presentations
4. Scheduled quizzes

**Grading Procedures**

**Exams and Assignments:**

<table>
<thead>
<tr>
<th></th>
<th>Points Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (3 @ 100 points)</td>
<td>300</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>100</td>
</tr>
<tr>
<td>Vineyard design project</td>
<td>100</td>
</tr>
<tr>
<td>Research Paper Reviews</td>
<td>150</td>
</tr>
<tr>
<td>Assignments (2 @ 10 points)</td>
<td>20</td>
</tr>
<tr>
<td>Scheduled Quizzes (3 @ 10 points)</td>
<td>30</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>700</strong></td>
</tr>
</tbody>
</table>

**Grading Standards:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Final Avg. Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 to 100%</td>
</tr>
<tr>
<td>B</td>
<td>80 to 89%</td>
</tr>
<tr>
<td>C</td>
<td>70 to 79%</td>
</tr>
<tr>
<td>D</td>
<td>60 to 69%</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 60%</td>
</tr>
</tbody>
</table>
General Information

Instructional Methods
Instructional methods include recorded lectures and readings on Blackboard.

Course Organization:
This course is organized into 15 Learning Modules. You will follow the course schedule at the end of this syllabus. It includes all exam and assignment due dates.

Viewing Your Grades:
You can access your grades on the Blackboard menu (My Grades). Grades will be posted after the due date and after all assignments have been graded.

E-mail:
• Instructors will respond to your e-mail messages within 24 hours on weekdays, and within 48 hours on weekend.

Technology Requirements:
• Internet access. A high-speed connection is recommended for Blackboard. If you do not have Internet access at home, you can probably find it at public libraries.
• Microsoft Office (free download from your E-raider account)
• Blackboard

Technical Assistance:
• For general technical assistance, call 806-742-HELP.
• For assistance with Blackboard, visit the Blackboard Student Support website at http://www.tltc.ttu.edu/content/asp/blackboard/SupportStudent.asp

Technical Skill Requirements:
You are expected to have a working knowledge of Microsoft Word, e-mail, using Internet search engines, downloading plug-ins and applications such as Flash and Java. You are also expected to submit assignments through the Blackboard Assignment Tool.

Class Policies

Make-up Exams/Quizzes
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Texas Tech University treats plagiarism as a very serious offense. Sanctions for plagiarism could range from dismissal from the university to failing the assignment on which the plagiarism occurred. Plagiarism, cheating and related issues are addressed by university Operating Procedure 34.12.

Student Disability Services

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<td>Spring Break</td>
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Plant and Soil Science 4310, Section D01
Viticulture II – Grape Production
Syllabus, Spring 2015

Instructors: Dr. Edward Hellman
             e-mail: ed.hellman@ttu.edu
             Phone : 746-4038
             Office: PS 260
             Office Hours: By appointment

Course Description:
PSS 4310 Viticulture II – Grape Production. Prerequisite: PSS 3310 Viticulture I
Blackboard Lectures: 3/week
Online Discussion and Assignments

Course Purpose:
The purpose of our course is to enable the student to display knowledge of the application of viticultural principles to the commercial production of grapes. Students will gain knowledge of the practical aspects of establishing and operating a vineyard including site selection, vineyard design, variety and rootstock selection, planting, training, pruning, canopy management, irrigation, soil management, nutrition, pests, diseases, maturity monitoring, harvesting, and economics.

Required Text: 
Grape Grower’s Handbook
Author: Ted Goldammer
Publisher: Apex Publishers
Publication Date: August 2013

Required Content Online (Blackboard)
Narrated Powerpoint presentations for lectures
Supplemental reading and websites
Assignments
Class Discussion

Learning Objectives
1. Students will demonstrate an understanding of the effects that physical characteristics (climate, soils etc.) of growing sites have upon grape production.
2. Students will demonstrate an understanding of the effects that vineyard management practices have upon yield and fruit quality.
3. Students will demonstrate the integration of viticultural knowledge to make decisions essential to vineyard management.

Expected Learning Outcomes

1. Students will demonstrate applied and theoretical knowledge within the field of Horticulture.
2. Students will demonstrate technical and professional skills needed to function within a complex and global society.

Methods for Assessing Expected Learning Outcomes

Learning outcomes will be assessed by:
1. Closed-book exams
2. Vineyard design project
3. Student presentations
4. Scheduled quizzes

Grading Procedures

<table>
<thead>
<tr>
<th>Exams and Assignments:</th>
<th>Points Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (3 @ 100 points)</td>
<td>300</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>100</td>
</tr>
<tr>
<td>Vineyard design project</td>
<td>100</td>
</tr>
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<td>Assignments (3 @ 10 points)</td>
<td>30</td>
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<td>Scheduled Quizzes (3 @ 10 points)</td>
<td>30</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>560</strong></td>
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Grading Standards:

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<tr>
<td>A</td>
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<td>F</td>
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General Information

Instructional Methods
Instructional methods include recorded lectures and readings on Blackboard.

Course Organization:
This course is organized into 15 Learning Modules. You will follow the course schedule at the end of this syllabus. It includes all exam and assignment due dates.

Viewing Your Grades:
You can access your grades on the Blackboard menu (My Grades). Grades will be posted after the due date and after all assignments have been graded.

E-mail:
- Instructors will respond to your e-mail messages within 24 hours on weekdays, and within 48 hours on weekend.

Technology Requirements:
- Internet access. A high-speed connection is recommended for Blackboard. If you do not have Internet access at home, you can probably find it at public libraries.
- Microsoft Office (free download from your E-raider account)
- Blackboard

Technical Assistance:
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INSTRUCTOR:  Joey Young, Ph.D.
    Plant Science, Room 256
    Phone: 806-742-2838 ext. 238
    Email: joey.young@ttu.edu

OFFICE HOURS:  Arrange by appointment/Open door policy

CLASS LOCATION AND TIME:  PS 109; T, Th 3:30 – 4:50 PM

PREREQUISITE:  PSS 3309, or
    Consent of instructor

TEXTBOOKS:
    •  Compendium of Turfgrass Diseases 3rd Ed. R. Smiley, P. Dernoeden, and B.
      Clarke. APS Press.
    •  Weed Control in Turf and Ornamentals. A. Turgeon, L. McCarty, and N.
      Christians. Pearson Ag
      of Amer.

COURSE DESCRIPTION:  A comprehensive study of common turfgrass pests
    including weeds, diseases, and insects. The ability to identify these common pests is
    imperative to be able to implement the best management practices. An integrated pest
    management approach will be discussed for turfgrass pests covered in the class.

EXPECTED LEARNING OUTCOMES:  Upon completion of this course, students
    will be able to:

    1. Identify problematic turf pests from all regions of the US.
    2. Comprehend the biological life cycle of pests that affect turfgrass
    3. Apply integrated pest management strategies for common turfgrass pests
    4. Understand modes-of-action for common pesticides used in turf management.

METHODS OF MEASURING EXPECTED OUTCOMES:
    ATTENDANCE:  Students will start the semester with a 100 for attendance. Students
    will be allowed 2 inexcusable absences without a reduction in attendance points. For each
    absence thereafter, 5 points will be subtracted from the starting 100 points. Students that
    do not miss a single class throughout the semester will receive an additional 10 points to
    their attendance grade for a total of 110 points.

    QUIZZES:  Several quizzes will be given throughout the semester. These quizzes will
    cover lecture material, homework exercises, and any class assignments (readings,
    handouts, etc.).
HOMEWORK ASSIGNMENTS: Several reading or video exercises will be assigned throughout the semester that will stress material presented in lecture. Discussion on the topic will occur the next class period.

EXAMS: There will be three semester exams that will cover lecture material, homework assignments, and any class assignments (readings, handout, etc.). Exams will emphasize short answer, essay, problem solving questions, true/false, and multiple choice questions. The Final Exam will be comprehensive.

EXAM POLICY:
Exams are expected to be taken at the scheduled time. If there is any reason why you can not take an exam during the scheduled time, you should discuss the reason with me before the exam.

GRADING: The following activities will contribute to your grade:

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<td>100 pts</td>
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<td>300 pts</td>
</tr>
<tr>
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<td><strong>Total</strong></td>
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A 630 – 700 pts  90 – 100%
B 560 – 629 pts  80 – 89%
C 490 – 559 pts  70 – 79%
D 420 – 489 pts  60 – 69%
F 419 or below  < 60%

CLASS ATTENDANCE: Students are expected to have read assigned readings prior to the day’s class, attend each class lecture, complete and return homework assignments by each deadline, and actively participate in each class session. Students are expected to notify Dr. Young regarding excusable absences according to the university’s “Academic Regulations” policy.

ACADEMIC REGULATIONS: Please refer to the 2013-2014 Texas Tech University Undergraduate and Graduate Catalog for a complete list of “Academic Regulations”.

Reporting Illness: In case of illness that will require absence from class for more than one week, the student should notify his or her academic dean. The dean’s office will inform the student’s instructors through the departmental office. In case of class absences because of a brief illness, the student should inform the instructor directly. Other information related to illness is found in the Student Handbook and the Residence Halls Handbook.
Absence Due to Religious Observance: A student who is absent from class for the observance of a religious holy day, according to the legal definition, will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence if, not later than the 15th day after the first day of the semester, the student has notified the instructor of each scheduled class that the student will be absent for a religious holy day.

This notification will be in writing and will be delivered by the student personally, with the receipt of the notification acknowledged and dated by the instructor, or by certified mail, return receipt requested, addressed to the instructor.

A student who is excused under this policy must not be penalized for the absence, but the instructor may appropriately respond if the student fails to satisfactorily complete the assignment.

Absence Due to Officially Approved Trips: Department chairpersons, directors, coaches, or person responsible for a student representing the university on officially approved trips should notify the student’s instructors of the departure and return schedule in advance. The instructor so notified must not penalize the student, although the student is responsible for material missed.

Academic Integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.

“Scholastic dishonesty” includes, but not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student or the attempt to commit such an act.

Cheating: Dishonesty on examinations, quizzes, or homework assignments; illegal possession of examinations, the use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry to or unauthorized presence in an office are instances of cheating.

Plagiarism: Offering the work of another as one’s own, without proper acknowledgement, is plagiarism; therefore any student who fails to give credit for quotations or an essentially identical expression of material taken from books, encyclopedias, magazines, and other reference works, or from the themes, reports, or other writings of a fellow student, is guilty of plagiarism.

Classroom Conduct: Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to ensure that all students have an
opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from using cellular phones or beepers or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a request to leave class.

1. Please turn off cellular phones and pagers, no texting, do not eat or drink in class, talk to neighbors, or engage in any other forms of distraction.
2. Please treat others with courtesy. People engaged in disruptive or rude behavior may be asked to leave the classroom.
3. Suspected cases of cheating or plagiarism will be handled according to the academic regulations of the University. If it is determined that cheating occurred, the student will be dismissed and fail the class.
4. Quizzes, written assignments, project designs, and exams may be made up only with a valid excuse, and prior approval of the instructor.
5. “The department, college, and university endorse PL 101-336, the Americans with Disabilities Act of 1990. Students with disabilities are encouraged to inform the faculty member so that any needed accommodations can be provided. All attempts will be made to maintain confidentiality.”
6. It is the policy of the university to accommodate the religious observances of students, based on Texas statutes. If there are religious observances that would interfere with student participation in class events, please let the instructor know as soon as possible, so that alternate arrangements may be made.

Students with Disabilities: Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.

Student Resolution Center: The Student Resolution Center is available to assist students with any conflict or problem that has to do with being a student at Texas Tech University. You may visit the Student Resolution Center in 232E Student Union Building or call 742-7233.
## Tentative Course Outline

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16</td>
<td>Syllabus/Course Outline/Get to know everyone</td>
</tr>
<tr>
<td>1/21</td>
<td>General Turfgrass Weed Introduction</td>
</tr>
<tr>
<td>1/23</td>
<td>Turfgrass Weed Identification</td>
</tr>
<tr>
<td>1/28</td>
<td>Turfgrass Weed Identification</td>
</tr>
<tr>
<td>1/30</td>
<td>Turfgrass herbicide Mode of Action</td>
</tr>
<tr>
<td>2/4</td>
<td>No Class – Dr. Young at GCSAA Meeting</td>
</tr>
<tr>
<td>2/6</td>
<td>No Class – Dr. Young at GCSAA Meeting</td>
</tr>
<tr>
<td>2/11</td>
<td>Grass and Sedge control in Turf</td>
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<tr>
<td>2/13</td>
<td>Grass and Sedge control in Turf/Review for Exam</td>
</tr>
<tr>
<td>2/18</td>
<td>Exam I on Turf Weeds</td>
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<tr>
<td>2/20</td>
<td>Turf Pathology Introduction</td>
</tr>
<tr>
<td>2/25</td>
<td>Fungicide classifications, modes of action, and terminology</td>
</tr>
<tr>
<td>2/27</td>
<td>Foliar turfgrass diseases</td>
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<tr>
<td>3/4</td>
<td>Root infecting diseases</td>
</tr>
<tr>
<td>3/6</td>
<td>Specific turf diseases and Fungicide resistance management</td>
</tr>
<tr>
<td>3/11</td>
<td>Fungicide resistance management and Review for Exam</td>
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<tr>
<td>3/13</td>
<td>Exam II on Turf Diseases</td>
</tr>
<tr>
<td>3/18</td>
<td>No Class – Spring Break</td>
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<tr>
<td>3/20</td>
<td>No Class – Spring Break</td>
</tr>
<tr>
<td>3/25</td>
<td>Introduction to turfgrass entomology</td>
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<tr>
<td>3/27</td>
<td>Description of turfgrass insects #1</td>
</tr>
<tr>
<td>4/1</td>
<td>Description of turfgrass insects #2</td>
</tr>
<tr>
<td>4/3</td>
<td>Description of turfgrass insects #3</td>
</tr>
<tr>
<td>4/8</td>
<td>Description of turfgrass insects #4</td>
</tr>
<tr>
<td>4/10</td>
<td>IPM for turfgrass insects</td>
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<tr>
<td>4/15</td>
<td>Microbial and insecticide control options for turf insects</td>
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<tr>
<td>4/17</td>
<td>Insecticides and managing resistance</td>
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<tr>
<td>4/22</td>
<td>Review for Exam</td>
</tr>
<tr>
<td>4/24</td>
<td>Exam III on Turf Insects</td>
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<tr>
<td>4/29</td>
<td>Sprayer calibration math</td>
</tr>
<tr>
<td>5/1</td>
<td>Sprayer calibration math</td>
</tr>
<tr>
<td>5/6</td>
<td>Final Exam Review</td>
</tr>
<tr>
<td>5/8</td>
<td>Final Exam (4:30 – 7:00 PM)</td>
</tr>
</tbody>
</table>
II. **Course Description:**

The focus of this course is the physiological principles and industry practices in the production, moving, care, and maintenance of ornamental trees, shrubs, and ground covers. The purpose of this course is to provide students the career tools to install and maintain woody plants. This goal will be accomplished through the review of the pertinent literature and through class exercises designed to improve the students’ skills and knowledge of woody plant physiology, care and maintenance. This course is designed for students without previous experience in arboriculture.

III. **Course Purpose:**

The overarching purpose of this course is to introduce students to the tree care industry and to develop an appreciation and understanding of tree physiology and growth.

IV. **Text:** *Arboriculture: Integrated Management of landscape Trees, Shrubs, and Vines (4th Edition)* - Harris, Clark, and Matheny

V. **References Used for This Class:**

A. *Tree Maintenance* - P. P. Pirone
B. *Diseases of Trees and Shrubs* - Sinclair, Lyon & Johnson
C. *Insects That Feed on Trees and Shrubs* - Johnson & Lyon
VI. **Expected Learning Outcomes:**

Upon completion of this course, the students will be able to:

A. Demonstrate their knowledge of the impact of environmental conditions on the growth and maintenance of trees and shrubs
B. Demonstrate knowledge of tree physiology and maintenance
C. Evaluate tree health and complete tree appraisals
E. Diagnose common tree problems
F. Select appropriate, healthy trees for planting

VII. **Methods for Assessing the Expected Learning Outcomes:**

The expected learning outcomes for the course will be assessed through several of the following methods: exams, content application exercises, class discussions using the discussion board, writing assignments, projects or article critiques.

VIII. **Course Assignments and Grading Procedures:**

A. **Hourly Exams:** There will be four hourly exams worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, short answer and essay. Exam dates are listed in the Course Schedule. The final exam will not be comprehensive. It will be the same format as the 3 prior exams.

B. **Proctor:** You will be required to locate a proctor to take your hourly exams. You may select from the following resources: Testing facilities at another institution, your commanding officer, learning centers, a librarian (in a small town only), or a school counselor. Please forward your proctor information to: Ms. Diann Merriman at: [diann.merrian@ttu.edu](mailto:diann.merrian@ttu.edu) Ms. Merriman will be responsible for approving your proctor and will also send out all of the key phrases to allow you to take your exams online. You must have your proctor information submitted 1 week prior to the first exam. If you do not do so, you will not be able to make up your missed exam.

B. **Review Quizzes:** There will be three review quizzes during the semester that will each be worth 10 points. These quizzes are intended to determine the students’ comprehension of presented material and encourage the students to keep up with their reading assignments. These quizzes must be completed within the time
allotted. There will be no makeup quizzes offered as this is part of your participation and attendance points.

C. **Daily Assignments:** There will be two daily assignments during the semester in which the students will apply their understanding of the course materials and complete exercises such as estimating tree value, determining fertility needs or other common tree care practices. Each assignment will be worth 20 points.

D. **Article Critiques:** There will be 4 article critiques that will be worth 50 points each. These articles may be from popular publications, trade journals or industry magazines covering woody plants such as *American Horticulturist, Arbor Age* or *American Nurseryman*. Alternately you may use article from referee journals such as *The Journal of Arboriculture* or *The J. of Amer. Soc. of Hort. Sci.* Please make sure you have a mixture of sources and include at least two referee journals in your selections. You will find these assignments as discussions under the **Discussions** link on the homepage menu. For the first critique, you may use one of the articles located in the **Critique 1 Articles** folder on the home page. Your remaining 3 articles must be sourced from another location. The following format should be followed for each critique:

1. Type the citation at the top of the paper in citation format.
2. In the body of the critique, give a brief summary of the article. This should be about 1 page long.
3. For the second page, identify what you found thought provoking.
4. Discuss whether you agree or disagree with the position of the author and explain why.
5. State the value of this article to the discipline and whether you would recommend that your classmates should read it.
6. Submit your critique to **turnitin.com prior** to submitting it through the course platform. Your turnitin.com originality report must be 20% or less before you load it into the Blackboard website. Please scan and e-mail or provide a hot link to the article you are critiquing. All articles must be by the date provided in the course calendar.
7. You may access turnitin.com at the following location: [http://library.ttu.edu/turnitin/turnitin.php](http://library.ttu.edu/turnitin/turnitin.php)
   Use your eRaider credentials to sign in. Your password is “texastech” all in lower case.
E. **Term Paper**: The course project for this class will be a term paper on a subject that is approved by the instructor. This paper will be worth 100 points and due on the date listed in the course outline. The following guidelines must be followed:

1. Double-spaced
2. 8 or more references, no more than 2 of these may be from unrefereed sources.
3. 6-8 pages in length excluding references and illustrations. Please be concise.
4. Citations. Follow the ASHS citation methodology.

**In Text:**
(Jones & Baker, 1999)

**In Literature Cited Section:**


5. Suggested References (These are just a few):

*Hort Science*  
*American Forestry*

*Journal of Forestry*  
*Text books*

*Gov and State Extension Bulletins*  
*Journal of Arboriculture*

*Journal of Amer Soc of Hort Sci*

6. Suggested Potential Topics (These are just a few):

Herbicide Injury  
Compaction

Saving Trees on Construction Sites  
Growth Regulators

Diagnostic Techniques  
Tree Ordinances

**IX. Grades:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight (pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
<td>4 @ 100 pts</td>
</tr>
<tr>
<td>Term Paper</td>
<td>1 @ 100 pts</td>
</tr>
<tr>
<td>Daily Assignments</td>
<td>2 @ 20 pts</td>
</tr>
<tr>
<td>Article Critiques</td>
<td>4 @ 50 pts</td>
</tr>
<tr>
<td>Review Quizzes</td>
<td>3 @ 10 pts</td>
</tr>
</tbody>
</table>
Student Homepage   1 @   10 pts   10
Syllabus Quiz   1@   10 pts   10
TOTAL          800

X. **Point Distribution:**

\[
A = 800-720 \\
B = 719-640 \\
C = 639-560 \\
D = 559-480 \\
F = 479 and below
\]

XI. **General Information:**

A. All late work will have **10 %** deducted for each day or part of a day it is late.

B. If you miss an exam for any reason, you must make appropriate arrangements within 3 days or a score of "0" will be recorded.

C. If you are consistently absent, I will notify your dean and consider your attendance when giving the final grade.

D. There will be no extra credit offered in this course. Please do not ask.

E. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from “AccessTECH” located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process.” The URL for AccessTECH is located at:

http://www.accesstech.dsa.ttu.edu/default.asp

F. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction.
G. “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.”

XII. **Tentative Lecture Schedule:**

Introduction, History of the Industry

Plant Classification

The Urban Forest, Climate and Environment

Plant Function

Planting Site and Appropriate Tree Selection

Roots

Stems

Shoots and Leaves

**Exam 1**

Physiology

Basic Needs

Construction

Fertility

Tree Feeding

Container Planting

Bare Root Planting Practices
Exam 2

B and B Planting Practices
Planting Containerized Plants
Plant Staking and After Care
Mulching
Why Prune
Pruning Practice
Controlling Plant Growth

Exam 3

Tree Hazard Management - Tree Repair
Bracing and Cabling
Tree Appraisal
Diagnosis of Tree Problems
Nonparasitic Problems
Abiotic Damage
Diseases

Plant Pests and Pathogens

Final Exam

* Topics or exam dates may change with prior notification
INTRODUCTORY ARBORICULTURE
SYLLABUS*
PSS 4313

Lecture Instructor:
Dr. Cynthia McKenney
Department of Plant and Soil Science
Texas Tech Univ
M.S. 2122
Lubbock, TX  79409-2122

Phone:  806-742-2854
Fax:  806-742-0775
e-mail:  cynthia.mckenney@ttu.edu

II.  Course Description:
The focus of this course is the physiological principles and industry practices in the production, moving, care, and maintenance of ornamental trees, shrubs, and ground covers. The purpose of this course is to provide students the career tools to install and maintain woody plants. This goal will be accomplished through the review of the pertinent literature and through class exercises designed to improve the students’ skills and knowledge of woody plant physiology, care and maintenance. PSS 1411 or the equivalent is a prerequisite.

III.  Course Purpose:
The overarching purpose of this course is to introduce students to the tree care industry and to develop an appreciation and understanding of tree physiology and growth. This upper division course is one of the directed electives for both the horticulture major and minor.


V.  References Used for This Class:
   A.  Tree Maintenance - P. P. Pirone
   B.  Diseases of Trees and Shrubs - Sinclair, Lyon & Johnson
VI. **Expected Learning Outcomes:**

Upon completion of this course, the students will be able to:

A. Demonstrate their knowledge of the impact of environmental conditions on the growth and maintenance of trees and shrubs
B. Demonstrate knowledge of tree physiology and maintenance
C. Evaluate tree health and complete tree appraisals
D. Demonstrate knowledge of plant classification and binomial nomenclature
E. Diagnose common tree problems
F. Select appropriate, healthy trees for planting

VII. **Methods for Assessing the Expected Learning Outcomes:**

The expected learning outcomes for the course will be assessed through several of the following methods: exams, content application exercises, daily quizzes, class discussion, writing assignments, projects or article critiques.

VIII. **Course Assignments and Grading Procedures:**

A. **Hourly Exams:** There will be four hourly exams worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, short answer and essay. Exam dates are listed in the Course Schedule. The final exam will not be comprehensive. It will follow the same format at the 3 prior exams.

If you are within 50 miles of the TTU campus, you are expected to come in and take your exams at the scheduled time. If you are further away than 50 miles, you may take your exams with an approved proctor. You may access a Sylvan Learning Center, a local library with Internet access and a librarian willing to proctor you, a testing center at a local community college, a commanding officer in the military, or a local high school counselor. You are responsible for any required fees. In order to utilize this option, your proctor’s
information and credentials must be approved in advance. The day of your exam, report to your proctor with a photo ID and your proctor will supply your password to access the exam. Please take the time to secure your proctor within the first two weeks of the course. On the day of the exam, if there are any problems accessing your exam, please call! Take my contact information with you to the exam.

B. Review Quizzes: There will be four review quizzes during the semester that will each be worth 10 points. These quizzes are intended to determine the students’ comprehension of presented material and encourage the students to keep up with their reading assignments. These quizzes will be available one week before each of the hourly exams and must be completed within the time allotted.

C. Assignments: There will be two assignments during the semester in which the students will apply their understanding of the course materials and complete exercises such as estimating tree value, determining fertility needs or other common tree care practices. Each assignment will be worth 20 points. You will find these assignments under the ASSESSMENT link. By the end of the first week of class each student will submit a document that contains their picture that introduces themselves to the class. This assignment will be worth 10 points.

D. Article Critiques/Discussions: There will be 3 article critiques that will be worth 20 points each. These articles should be from refereed journals such as The Journal of Arboriculture or The Journal of American Society of Horticultural Science. The following format should be followed:

1. In the discussion area start a new discussion topic for the appropriate article critique. Use your name as the topic heading.
2. Type the citation at the top of the message. The critique you type in the message area should be the equivalent of one (1) typewritten page.
3. In the body of the message, give a brief summary of the article.
4. Identify what you found thought provoking.
5. Discuss whether you agree or disagree with the position of the author and explain why.
6. State the value of this article to the discipline and whether you would recommend that your classmates should read it.

7. Each student must respond to a minimum of two students in the class regarding their critique for each round of critiques.

8. Each response must be a minimum of 4 sentences and use “G” rated language.

7. Use one of the eight articles provided in a folder on the homepage for this course in Blackboard. You must find your own refereed journal article for Critique 2 and 3, and attach the article you are critiquing.

IX. Grades:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
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<tr>
<td>Assignments</td>
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<td>40</td>
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<td>Review Quizzes</td>
<td>4 @ 10 pts</td>
<td>40</td>
</tr>
<tr>
<td>Article Critiques</td>
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<td>60</td>
</tr>
<tr>
<td>Student Homepage</td>
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X. Point Distribution:

\[
A = 550-495 \\
B = 494-440 \\
C = 439-385 \\
D = 384-330 \\
F = 329 and below
\]

XI. General Information:

A. All late work will have **10 points** deducted for each day or part of a day it is late.

B. If you miss an exam for any reason, you must make appropriate arrangements within 3 days or a score of "0" will be recorded.

C. There will be no extra credit offered in this course.

D. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification
from “AccessTECH” located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process.” The URL for AccessTECH is located at: http://www.accesstech.dsa.ttu.edu/default.asp

E. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction.

F. “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.”

XII. Lecture Schedule:

- Introduction, History of the Industry
- The Urban Forest, Climate and Environment
- Plant Structure: Roots and Stems, Shoots and Leaves
- Physiology, Basic Needs
- Basic Needs,
- Planting Site and Appropriate Tree Selection
- Exam 1
- Bare Root Planting Practices
- B and B Planting Practices
- Environmental Modifications
- Pruning
- Nutrition
- Exam 2
- Fertility
- Preserving Existing Trees
- Abnormalities of Woody Plants
- Tree Repair
- Tree Appraisal
Exam 3

- Diagnosis of Woody Plant Problems
- Nonparasitic Problems
- Insects and Mites
- Pathogenic Injury
- Integrated Plant Management

Final Exam

*...Topics or exam dates may change with prior notification*
PSS 5317-001  
Advanced NURSERY MANAGEMENT  
SPRING 2011

I. Instructor:  
Dr. Cynthia McKenney  
Plant Science Building Room 105

Class Location:  
MWF 10:00-10:50   PSS 108  
Exams:  ATLC Computer Lab

Phone:  
806-742-2854

e-mail:  
cynthia.mckenney@ttu.edu

II. Course Description:

This course focuses on the principles of management, marketing, structures, and distribution for retail nursery establishments. At the completion of this course, the students will be expected to complete a nursery startup proposal.

III. Course Purpose:

This upper division horticulture class is one of the two courses designed to fulfill the capstone course requirement for the Horticulture program at Texas Tech University. Thus, knowledge gained in several lower division classes provides the basis for the analysis and synthesis of new information to provide plausible solutions to management problems. In addition, this course serves as a writing intensive course for the discipline. The exercises incorporated in this course and the individual feedback provided on these exercises is designed to improve the students’ verbal and written communication skills within the discipline. The overarching purpose of this course is to introduce the students to current nursery industry theories and practices and to facilitate the application of this knowledge to complete a nursery startup proposal.

IV. Text:  
*The Complete Guide to Garden Center Mgmt*-Stanley  
*The Business Planning Guide*- Bangs
VI. References:

A. *Nursery Management Administration and Culture* - Davidson and Mecklenburg  
B. *Garden Center Management* - Barton  
C. *Profitable Garden Center Management* - Berninger

VII. Expected Learning Outcomes:

Upon completion of this course, the students will be able to:

A. Complete financial statements  
B. Analyze current industry problems /issues while posing practical solutions  
C. Critique and modify any problems within an existing garden center’s layout  
D. Prepare a proposal to start up a private nursery operation  
E. Design functional and appropriate displays  
F. Interview and train personnel  
G. Demonstrate their ability to handle daily business decisions such as pricing merchandise and selecting product mix and services

VIII. Methods for Assessing the Expected Learning Outcomes:

The expected learning outcomes for the course will be assessed through several of the following methods: exams, content application exercises, daily quizzes, class discussion, writing assignments and projects.

IX. Course Assignments and Grading Procedures:

A. Field Trips: Two independent field trips will be taken during this course. Reports summarizing the trips will be completed following the excursion and the due dates will be outlined on the course website. These reports should have a title page and include an introduction, critique of the business being visited and a conclusion. The reports should be about one page in length per location and submitted through the WebCT platform. Each report is worth 20 points.

B. Hourly Exams: There will be four hourly exams worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, short answer and essay. Exam dates are listed on the course website. The final exam will not be comprehensive. It will have the same format at the 3 prior exams. Students that are on a participating campus must report to the
designated testing facility indicated. Those students in excess of 50 miles from a campus must secure a proctor and provide information to the instructor of the course prior to the exam.

C. **Content Quizzes:** There will be four content quizzes during the semester that will each be worth 10 points. These quizzes are intended to determine the students’ comprehension of presented material and encourage the students to keep up with their reading assignments. These quizzes must be completed at the assigned time.

D. **Calculation Assignment:** During this course you will complete an assignment in which you will calculate the balance sheets, income statements and profit and loss forms for a nursery business. All calculations will be entered into the WebCT platform and will be automatically graded. This assignment is worth 20 points.

E. **Business Startup Project:** The term project for this course is to create a business plan/proposal suitable to submit to a bank for financing. Your primary resource for this task should be your business planning guide available at the bookstore. This project in and of itself is not difficult; however, it is very time consuming. Given this, it is imperative that you begin work immediately and work steadily on it throughout the semester. It is not possible to complete this plan the weekend before it is due. Please complete a document for each of the sample pages provided in the guide. This project is worth 150 points. The due date may be located on the course site.

F. **Article Critiques**
   During this course you will complete 4 journal article critiques which will be worth 25 points each. These are designed to familiarize you with the literature of the industry, hone your writing skills and allow you to improve your critical thinking. These will be uploaded via the course website in the assignment section. They will be published for your peers to review as material for upcoming exams. Further instructions are found on the course website.

G. **Lecture Presentation**
   You will prepare a 1 hour powerpoint presentation for the class to cover material pertinent with the course. Your topic and the presentation need to be approved by the instructor. This will provide you the opportunity to do a bit more in-depth research into the industry itself. The date will be provided by your instructor. This will be worth 50 points.
X. **Grades:**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
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</tr>
<tr>
<td>Final Exam</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Business Start Up</td>
<td>1 @150 pts</td>
<td>150</td>
</tr>
<tr>
<td>Calculations</td>
<td>1 @ 20 pts</td>
<td>20</td>
</tr>
<tr>
<td>Field Trip Reports</td>
<td>2 @ 20 pts</td>
<td>40</td>
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<tr>
<td>Article Critiques</td>
<td>4 @ 25 pts</td>
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<tr>
<td>Lecture Presentation</td>
<td>1 @ 50 pts</td>
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XI. **Point Distribution:**

\[
A = 800-736 \\
B = 735-656 \\
C = 639-600 \\
D = 599-520 \\
F = 519 and below
\]

XII. **General Information:**

A. All late work will have 10 points deducted for each day or part of a day it is late.

B. No makeup exams will be given unless prior arrangements have been made due to a scheduling conflict. If you miss an exam due to an illness, you have until the next class to make arrangements with me before a "0" is recorded. I will decide at that time if the absence is excused.

C. "The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from "AccessTECH" located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at:

http://www.accesstech.dsa.ttu.edu/default.asp.
D. Integrity and professionalism are expected at this level of education. Unauthorized collaboration on assignments or projects, as well as dishonesty on exams and quizzes will not be tolerated. **Suspected cases of cheating or plagiarism and grade disputes and appeals will be handled according to the academic regulations of the University.**

**Texas Tech University, Operating Policy and procedures 34.12, Grading Procedures:** It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempts of students to present as their own any work not honestly performed (as outlined below) is regarded by the faculty and administration as a most serious offense and renders offenders liable to serious consequences, possibly suspension for the Texas Tech University. Dishonesty of any kind on examinations, quizzes, or written assignments, illegal possession of examinations, use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry of unauthorized presence in an office, are all instances of cheating. The instructor in a course is responsible for initiating action in each case of dishonesty or plagiarism that occurs in that class. In cases of convincing evidence or of admitted academic dishonesty or plagiarism, an instructor should take appropriate action as described below. Before taking such action, however, the instructor should attempt to discuss the matter with the student. In cases in which guilt is admitted by the student or determined by the instructor, after attempting to contact the student, the offending student may be given a failing grade in a course as a result of academic dishonesty or plagiarism, the instructor should report in writing to the instructor’s department chairperson the facts of the case and the action to be taken against the student. The chairperson will provide a copy of the letter to the student, the student’s dean, the Student Mediation Center, and the chairperson’s dean. The Student Mediation Center shall retain a copy of this report in its discipline files. The student will have the right to appeal the receipt of a failing grade in a course through the established grade appeal procedure. The student may not appeal a failing grade given for class assignments.
E. “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.”

F. There will be no extra credit offered in this course. Please do not ask.

XIII. **Tentative Lecture Schedule:**

I. **Going into Business:**

   Introduction, History of the Industry
   Location & Market
   Site Selections and Layout
   Organizational Structure
   Product Mix and Services / Image
   Energy Conservation and Safety

II. **Merchandizing and Marketing:**

   Seasonal Variations in Trade
   Public Relations and Advertising
   **Exam 1**
   Signs, Promotions, and Selling Aids
   Pricing
   Sales Areas, Flow and Displays

III. **Financial Planning and Management:**

   Balance Sheets and Income Statements
   Profit and Loss / Record Keeping
   Cash Flow
   Payroll
   **Exam II**
   Inventory
   Financial Ratios, Break Even Analysis
   Buying and Selling a Business
   Credit, Loans and Financing
   Labor and Production Costs
   **Exam III**
IV. Daily Operations and Management

Communications
Management Styles
Family Conflicts
Interviews
Hiring and Training
Laws and Codes / Grades & Standards / Shipping and Receiving
Plant Maintenance and Water Quality

Final Exam
I. **Instructor:**

Dr. Cynthia McKenney  
Plant Science Building Room 105  

Office: PS 105  
Phone: 806-834-0722  
e-mail: cynthia.mckenney@ttu.edu

II. **Course Description:**

This course focuses on the principles of management, marketing, structures, and distribution for retail nursery establishments. At the completion of this course, the students will be expected to complete a nursery startup proposal.

III. **Course Purpose:**

This upper division horticulture class is one of the two courses designed to fulfill the capstone course requirement for the Horticulture program at Texas Tech University. Thus, knowledge gained in several lower division classes provides the basis for the analysis and synthesis of new information to provide plausible solutions to management problems. In addition, this course serves as a writing intensive course for the discipline. The exercises incorporated in this course and the individual feedback provided on these exercises is designed to improve the students’ verbal and written communication skills within the discipline. The overarching purpose of this course is to introduce the students to current nursery industry theories and practices and to facilitate the application of this knowledge to complete a nursery startup proposal.

IV. **Text:** *The Complete Guide to Garden Center Mgmt* - Stanley  
*The Business Planning Guide* - Bangs

V. **Expected Learning Outcomes:**
Upon completion of this course, the students will be able to:

A. Complete financial statements
B. Analyze current industry problems /issues while posing practical solutions
C. Critique and modify any problems within an existing garden center’s layout
D. Prepare a proposal to start up a private nursery operation
E. Design functional and appropriate displays
F. Interview and train personnel
G. Demonstrate their ability to handle daily business decisions such as pricing merchandise and selecting product mix and services

VI. Methods for Assessing the Expected Learning Outcomes:

The expected learning outcomes for the course will be assessed through several of the following methods: exams, content application exercises, daily quizzes, class discussion, writing assignments and projects.

VII. Course Assignments and Grading Procedures:

A. Field Trips: Two independent field trips will be taken during this course. Reports summarizing the trips will be completed following the excursion and the due dates will be outlined on the course website. These reports should have a title page and include an introduction, critique of the business being visited and a conclusion. The reports should be about one page in length per location and submitted through the Blackboard platform. Each report is worth 20 points.

B. Hourly Exams: duplicate from herbaceous

C. Content Quizzes: There will be 10 module content quizzes during the semester that will each be worth 10 points. These quizzes are intended to determine the students’ comprehension of presented material and encourage the students to keep up with their reading assignments. These quizzes must be completed online at the assigned time. Generally, these quizzes will be open for one week prior to each examination. The due dates may be located on the course schedule.

D. Calculation Assignment: During this course you will complete an assignment in which you will calculate the balance sheets, income statements and profit and loss forms for a nursery business. All
calculations will be completed via the Blackboard platform and will be automatically graded. This assignment is worth 50 points. The due date may be located on the course schedule.

E. **Blog Assignments:** Please copy from herbaceous.

F. **Business Startup Project:** The term project for this course is to create a business plan/proposal suitable to submit to a bank for financing. Your primary resource for this task should be your business planning guide available at the bookstore. This project in and of itself is not difficult; however, it is very time consuming. Given this, it is imperative that you begin work immediately and work steadily on it throughout the semester. It is not possible to complete this plan the weekend before it is due. Please complete a document for each of the sample pages provided in the guide. This project is worth 150 points. The due date may be located on the course schedule.

G. **Article Critiques:** You will complete two article critiques for this course in which you review current literature and write an analysis of what you agree and disagree with. These will be posted for the class to utilize. Each will be worth 25 points.

H. **Seasonal Sales Plan:** You will create a seasonal sales plan which will provide for your operation to be successful year round. Identify the promotions by date and the impact they will have. Be sure to include any special activities or advertisement programs. This will be worth 50 points.

XIII. **Grades:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests: 4 @ 100 pts.</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Term Project: 1 @ 150 pts.</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Calculations: 1 @ 50 pts.</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Field Trip Reports: 2 @ 50 pts</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Blogs and Intros: 4 @ 25 pts</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Article Critiques: 2 @ 25 pts</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Seasonal Sales Plan: 1 @ 50 pts</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Content Quizzes: 10 @ 10 pts.</td>
<td>100</td>
<td>1000</td>
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</table>

IX. **Point Distribution:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>900 – 1000 (90-100%)</td>
</tr>
<tr>
<td>B</td>
<td>899 – 800 (80-89%)</td>
</tr>
<tr>
<td>C</td>
<td>799 – 700 (70-79%)</td>
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</tbody>
</table>
\[ D = 699 - 600 \quad (60-69\%) \]
\[ F = 599 \text{ and below} \quad (0-59\%) \]

X. General Information:

A. Missed exams will be recorded as "0" unless you contact me before the next class period concerning your absence. However, you must have a reasonable excuse (documented illness, death in the family, etc.) before a make-up exam will be considered.

B. Material turned in late will be penalized 10% for each day beyond the due date.

C. There will be **NO** extra credit offered in this course. Please do not ask.

D. "The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from “AccessTECH” located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: [http://www.accesstech.dsa.ttu.edu/default.asp](http://www.accesstech.dsa.ttu.edu/default.asp)

E. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction.

F. Integrity and professionalism are expected at this level of education. Unauthorized collaboration on assignments or projects, as well as dishonesty on exams and quizzes will not be tolerated. **Suspected cases of cheating or plagiarism and grade disputes and appeals will be handled according to the academic regulations of the University.**

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G. “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.”

H. Online learners are expected to maintain professionalism in communication at all times. Discussion forums and email messages should be courteous, grammatically correct and well proofed. Profanity, slang and flaming will not be tolerated.

XI. Tentative Lecture Schedule:

I. Going into Business:
Introduction, History of the Industry  
Location & Market  
Site Selections and Layout  
Organizational Structure  
Product Mix and Services / Image  
Energy Conservation and Safety

II. Merchandizing and Marketing:

Seasonal Variations in Trade  
Public Relations and Advertising  
Exam 1  
Signs, Promotions, and Selling Aids  
Pricing  
Sales Areas, Flow and Displays

III. Financial Planning and Management:

Balance Sheets and Income Statements  
Profit and Loss / Record Keeping  
Cash Flow  
Payroll  
Exam II  
Inventory  
Financial Ratios, Break Even Analysis  
Buying and Selling a Business  
Credit, Loans and Financing  
Labor and Production Costs  
Exam III

IV. Daily Operations and Management

Communications  
Management Styles  
Family Conflicts  
Interviews  
Hiring and Training  
Laws and Codes / Grades & Standards / Shipping and Receiving  
Plant Maintenance and Water Quality  
Final Exam
PSS 4316/5318 Distance Turfgrass Physiology and Ecology
Spring 2014

INSTRUCTOR:  Joey Young, Ph.D.  
Plant Science, Room 256  
Phone: 806-742-2838 ext. 238  
Fax: 806-742-0775  
Email: Use blackboard or joey.young@ttu.edu

PREREQUISITE:  PSS 3309  
or by consent of instructor

OFFICE HOURS:  Arrange by appointment via BB, email, phone, or Skype

CLASS LOCATION AND TIME:  January 15 – May 6, 2014

TEXTBOOK:  Turfgrass Physiology and Ecology, G. Bell. Modular Texts. (Required)

SUGGESTED READING:  
Best Golf Course Management Practices, L. B. McCarty. 2nd ed.


EXPECTED LEARNING OUTCOMES:  Upon completion of this course, students will be able to:

1. Identify the key components of C3 and C4 metabolism.
2. Determine the physiological response of turfgrass to several biotic and abiotic stresses.
3. Understand how ecological management can improve turfgrass competition.
4. Develop strategy for turf management with water restrictions or poor quality water.

METHODS OF MEASURING EXPECTED OUTCOMES:
BLACKBOARD DISCUSSIONS:  Participation type grade. Undergraduate and graduate students are separated in Blackboard, but expectations to participate in discussions will be required. I will post a topic related to class activities that each student should provide incite from their perspective.

HOMEWORK ASSIGNMENTS:  Several reading or video exercises will be assigned throughout the semester that will stress material presented in lecture. Discussion on the topic will occur the next class period.
QUIZZES: Several quizzes will be given throughout the semester. These quizzes will cover lecture material, homework exercises, and any class assignments (readings, handouts, etc.).

RESEARCH PROJECT: A research project will be assigned midway through the semester that will focus on a particular area of study. Students will work individually to gather information about their scenario and determine best management practices. A written report will turned in near the end of the semester.

EXAMS: There will be two semester exams that will cover lecture materials, homework assignments, and any class assignments (readings, handout, etc.). Exams will emphasize short answer, essay, problem solving questions, and multiple choice. The final exam will NOT be comprehensive.

REVIEW SESSIONS: Although this is a distance class, I would like to utilize technology for us to review items before tests. This could be accomplished throughout the semester using Skype, or I would like to schedule one or two times to have a Google+ Hangout. This is an option through the social media site Google+ and could allow many of us to have a video conference together in order for me to answer questions you may have regarding material that will be covered on the next day’s exam. Attendance at review sessions would not be required.

GRADING: The following activities will contribute to your grade:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB discussions</td>
<td>100 pts</td>
</tr>
<tr>
<td>Quizzes</td>
<td>100 pts</td>
</tr>
<tr>
<td>Research Projects</td>
<td>200 pts</td>
</tr>
<tr>
<td>Semester Exams</td>
<td>200 pts</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100 pts</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>700 pts</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>630 – 700 pts</td>
<td>90 – 100%</td>
</tr>
<tr>
<td>B</td>
<td>560 – 629 pts</td>
<td>80 – 89%</td>
</tr>
<tr>
<td>C</td>
<td>490 – 559 pts</td>
<td>70 – 79%</td>
</tr>
<tr>
<td>D</td>
<td>420 – 489 pts</td>
<td>60 – 69%</td>
</tr>
<tr>
<td>F</td>
<td>419 or below</td>
<td>&gt; 60%</td>
</tr>
</tbody>
</table>

GENERAL INFORMATION:

A. The class notes and lectures will be located on www.blackboard.ttu.edu the Texas Tech University BlackBoard website.

B. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. Any student who, because of a disability, may
require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.”

C. “Students are expected to assist in maintaining a classroom environment, which is conducive to learning. In order to assure that all students have an opportunity to gain from time spent in class”

D. This course is governed by the Texas Tech University academic integrity policy as elucidated at the following URL:

http://www.depts.ttu.edu/studentjudicialprograms/PDF-WordFiles/IntegrityMatters.pdf

GENERAL POLICIES

When sending emails or conversing with classmates in this class, here are some basic rules to help you get the most out of your online learning:

- ALL CAPS IMPLIES THAT YOU ARE SHOUTING – Please do not do this.
- Watch your “tone” – it is written, not verbal communication. It can be very easy to misinterpret someone’s meaning online.
- Check spelling – Always!
- Make your messages easier to read by making your paragraphs short and to the point.
- Never “say” anything that you would not want posted on the wall of a face-to-face classroom, because it could be!
- Behave as you would in a face-to-face classroom.
- Remember there is a real live person at the other end reading your posts and emails. Treat them with respect.
- Foul language, insults and harassment are not tolerated (just as it would not be tolerated in a face-to-face classroom)
- Think about what you have written before you submit it.

EXAM PROCTORING INFORMATION

You are enrolled in PSS 4316/5318, Applied Turfgrass Physiology and Ecology (distance version). All course information will be provided in BlackBoard. The link is http://www.depts.ttu.edu/lms/ You will login with your raider information. I will upload lectures that will be recorded via webcam. All lectures for each exam will be available via separate modules in BlackBoard. You will also find homework assignments and any additional information in each BlackBoard module associated with each lecture or section of the class.
Email: from this point forward, please use BlackBoard for all correspondence. It is a means for me to keep up with class separate from other emails. In an emergency, you may use the TTU account or call my office phone. I have BlackBoard set up to forward me any emails you send to my TTU account, so I will receive notification as soon as you send them.

Exam and Proctor details: There will be 3 exams worth 100 points including your Final Exam. Each exam will include a variety of question types (multiple choice, short answer, and essay). Exam dates are listed on the Course Calendar and tentative course outline below. All exams will be given online via BlackBoard. To ensure student integrity, each Exam will be proctored. Those on campus, or within driving distance of Texas Tech University may take Exams with Academic Testing Services (ATS, 806.742.3671). If you plan to use ATS, you need to let the instructor know you are following this option. Those not within driving distance of Texas Tech must submit their potential proctor’s name, title, business, physical address, phone number, and e-mail address to the instructor and Diann Merriman (diann.merriman@ttu.edu). Proctors may not be friends, family members, or have previously associated with students in any way (other than being a proctor for a previous course). Proctors must be located at an institution of higher education (testing center), Sylvan type Learning Center, high school library, public library, etc. After you submit information, the instructor will send each potential proctor an email requesting their willingness to participate. Some proctor for free, while others may charge for each Exam given. Please submit your information to me by 5:00 pm, January 24, 2014. There will be no exceptions to these requirements. If you do not submit proctor information by the above date and time, you will not be allowed to take Exams. In addition, if you do not make previous arrangements with the course professor and you miss an Exam you will not be able to make up the missed Exam.
# Tentative Course Outline

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/15-1/18</td>
<td>Syllabus/Course Outline/Introductions</td>
</tr>
<tr>
<td>1/15-1/18</td>
<td>Assignment - Brief introduction about yourself (10 pts)</td>
</tr>
<tr>
<td>1/20-1/24</td>
<td>Assignment – NTEP.org (20 pts quiz)</td>
</tr>
<tr>
<td>1/24</td>
<td>Deadline – Provide Exam proctor information (10 pt quiz)</td>
</tr>
<tr>
<td>1/24</td>
<td>C3 vs C4/Respiration and carbohydrate production</td>
</tr>
<tr>
<td>1/27-1/31</td>
<td>Transpiration effects/Management effects on physiology</td>
</tr>
<tr>
<td>2/10-2/14</td>
<td>Turf Soil and Nutrition/High Temperature Stress</td>
</tr>
<tr>
<td>2/17-2/21</td>
<td>Cold Temperature Stress/Prepare for Exam 1</td>
</tr>
<tr>
<td>2/25-2/27</td>
<td>Exam 1 Available (100 pts)</td>
</tr>
<tr>
<td>2/24-2/28</td>
<td>Introduction to Ecology</td>
</tr>
<tr>
<td>3/3-3/7</td>
<td>Turfgrass Ecology/Competition among plant species</td>
</tr>
<tr>
<td>3/10-3/14</td>
<td>Competition among plant species and pests</td>
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<tr>
<td>3/17-3/21</td>
<td>Spring Break</td>
</tr>
<tr>
<td>3/24-3/28</td>
<td>Making the right decisions/Prepare for Exam II</td>
</tr>
<tr>
<td>3/31</td>
<td>Review for Exam 2</td>
</tr>
<tr>
<td>4/1-4/3</td>
<td>Exam 2 Available (100 pts)</td>
</tr>
<tr>
<td>3/31-4/4</td>
<td>Irrigation management for turfgrasses</td>
</tr>
<tr>
<td>4/7-4/11</td>
<td>Water management/Water restrictions in Turf Management</td>
</tr>
<tr>
<td>4/14-4/18</td>
<td>Growing grass on soil, sand, and salt</td>
</tr>
<tr>
<td>4/21-4/25</td>
<td>Poor irrigation quality and turf management</td>
</tr>
<tr>
<td>4/28-5/7</td>
<td>Reviewing for final exam and preparing research paper</td>
</tr>
<tr>
<td>5/1</td>
<td>Research Project Paper Due (200 pts)</td>
</tr>
<tr>
<td>5/8-5/12</td>
<td>Final Exam Available (100 pts)</td>
</tr>
</tbody>
</table>
PSS 5319 Hybrid
Interior Plants
Tentative Syllabus

Lecture Instructor: Dr. Cynthia McKenney
Dept. of Plant and Soil Science
Phone: 806-835-0722
Fax: 806-742-0775
e-mail: cynthia.mckenney@ttu.edu

Lab Instructor: Ms. Summer Loneragan
Dept. of Plant and Soil Science
Phone: TBA
Fax: 806-742-0775
e-mail: summer.loneragan@ttu.edu

Class Location: Lecture: This graduate level course is offered as a hybrid with the lecture content on the internet using the Texas Tech University Blackboard portal. The URL for this course is: www.blackboard.ttu.edu

Lab: The laboratory content offered at the University Greenhouse in GH105. Lecture time is asynchronous; however, your laboratory is scheduled for Tuesday from 2:00-3:20.

Exams: Online testing will be conducted in the basement of the library during your normally scheduled laboratory time.

I. Course Description:

The focus of this course is the physiological principles and industry practices in the production, moving, care, and maintenance of interior plants. This course will provide students the career tools to design, install and maintain interior plantscapes. This goal will be accomplished through the review of the pertinent literature and through class exercises designed to improve your skills and
knowledge of interior plant physiology, care and maintenance.

II. **Course Purpose:**

The overarching purpose of this course is to introduce you the student to the interior plant industry and to develop an appreciation and understanding of foliage plant physiology and growth. This undergraduate level course is a frequently selected course for a M.S. in Horticulture.

III. **Text:** Lecture - No lecture text is required
Lab - Reference will be the online database of plant materials available at [http://www.pssc.ttu.edu/interiorscape/START.HTM](http://www.pssc.ttu.edu/interiorscape/START.HTM)

IV. **References Used for This Class that may be Available at Your Library or by Interlibrary Loan from Texas Tech:**

A. *Interior Plantscapes* – Manaker
B. *Flowering and Foliage Plant Book* - J. Henry
C. *Interior Landscaping* - Furuta
D. *Interior Plantscaping* - Gaines
E. *Garden Plants and Flowers* - Hays

V. **Expected Learning Outcomes:**

Upon completion of this course, you will be able to:

A. Demonstrate knowledge of the impact of environmental conditions on the growth and maintenance of interior plants.
B. Demonstrate knowledge of foliage plant physiology and maintenance.
C. Analyze current issues in the industry and supply plausible solutions.
D. Learn the growth and culture of over 150 foliage plants.
E. Become familiarized with the tropical plant families.
F. Evaluate existing interior installations and pose plausible solutions.

VI. **Methods for Assessing the Expected Learning Outcomes:**
The expected learning outcomes for the course will be assessed through several of the following methods: exams, content
application exercises, daily quizzes, class discussion using the discussion board, writing assignments, and projects.

VII. Course Assignments and Grading Procedures:
A. Hourly Exams: There will be four hourly exams worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, short answer and essay. Exam dates are listed in the Course Schedule. The fourth exam will be your final exam and it will not be comprehensive.

1. Grading on the listing questions will be as follows:
   - 2 pts for each plant
   - 1 pt for scientific name
   - 1 pt for spelling

2. Essay and short answer questions will be graded on the following:
   - 70% content
   - 30% grammar and spelling

Exams will be taken in the basement of the library. If for any reason you miss an exam, you must make arrangements for a makeup exam within three days or I will record a zero for your score. Make an appointment to take your exam early and check with your proctor before the exam date to be sure they have received your testing credentials to access the exam. Be sure none of your communications by e-mail use the term password as this will relegate your mail to the trash/spam folder of most computers.

B. Article Critiques: You will need to select 3 articles from peer reviewed journals on a relevant topic for the course. Read the article carefully and compose a 2 page article review. Put your name and date in the header. Give the article citation in ASHS format first. The Journal of HortScience follows this format. The first half of the review should summarize the study including the purpose, methods and findings. The second half should include your recommendations and reflections on how this study impacts the industry. Your critique should no longer than 2 pages excluding images and will be worth a total of 33 points. Use
C. Virtual Field Trip Assignments: There will be 3 discussion assignments during the semester in which you will have the opportunity to complete design critiques by traveling to a local facility, taking an image of the design and critiquing the physical accommodations, plant selection, lighting and plant maintenance level. Identify the highlights of the design and also include suggestions for improvement. Post your discussions in the blog area provided. It should be a minimum of one page and a maximum of 2 pages. In addition, respond to two of your classmates postings by critiquing their posts. In order to count as a response, your responding post must be a minimum of 10 sentences in total. The response must be on topic, professional, and insightful. You will be graded on the number and quality of posting/ responses you provide with each set of postings worth 50 pts. The grading is based on:

<table>
<thead>
<tr>
<th>Posting Content</th>
<th>23 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
<td>2 @ 5pts 10 pts</td>
</tr>
<tr>
<td>Total</td>
<td>33 pts</td>
</tr>
</tbody>
</table>

D. Plant Identification Exams and Quizzes: There will be 9 plant identification quizzes completed throughout the course with each quiz being worth 30 points. You will demonstrate your knowledge of the plant family, scientific name and
common name for a series of plants. Plants will be cumulative throughout the semester. These quizzes will be taken online but do not need to be proctored. A minimal time limit will be enforced as this is not designed to be open book.

Likewise, there will be plant ID questions on your hourly exams, thus, please stay current on your plants as you prepare for you hourly exam. ½ credit will be deducted for spelling or capitalization error.

E. **Student Homepage:** You will complete the student homepage by providing a picture, a few lines about yourself including your location during the class (this is not an address), career, and future career aspirations. The course is password protected so only class members will have access to the site. The homepages will allow you to get to know each of your virtual peers a bit more easily and will allow you to practice your skills at uploading materials and complete online assignments. Your homepage is due the seventh day after the course officially begins and is noted on the course calendar. It will be worth 15 points.

Grading will be as follows:

- Image: 3 pts
- Name, classification: 3 pts
- Major, hometown: 3 pts
- Plans for the future: 3 pts
- Fun fact about themselves: 3 pts

F. **Syllabus Quiz:** In order to help familiarize yourself with Blackboard 9.1 and the parameters of the course, you will be provided with a syllabus quiz located in the assessment section of the course. Please complete the quiz during the first week of the class. You will have 3 attempts at the quiz and the highest score will be recorded. This quiz will be worth 15 points.

VIII. **Grades:**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homepage and Quiz</td>
<td>2@</td>
<td>15 pts.</td>
</tr>
<tr>
<td>Hourly Exams</td>
<td>4@</td>
<td>100 pts.</td>
</tr>
<tr>
<td>Plant I.D. Quizzes</td>
<td>9@</td>
<td>30 pts.</td>
</tr>
</tbody>
</table>
IX. Point Distribution:

\[ A = 900 - 810 \]
\[ B = 809 - 720 \]
\[ C = 719 - 630 \]
\[ D = 629 - 540 \]
\[ F = 539 \text{ and below} \]

X. General Information:

A. All late work will have 10\% deducted for each day or part of a day it is late.

B. If you miss an exam for any reason, you must contact the instructor and make appropriate arrangements within 3 days or a score of "0" will be recorded. Makeup exams will be taken at the Academic Testing Service or with your proctor depending on your location. It is your responsibility to book the time and convey that information to the instructor so that an exam will be available for you when you arrive.

C. There will be no extra credit offered in this course. Please do not request any.

D. You will have about 15 to 20 plants a week to learn. It is important to keep up daily as the number of plants builds up quickly.

E. Due to the nature of this course, it includes both audio and visual components. The images of the interior designs and laboratory plant materials will not be accessible to those who are visually impaired. The scripts for the audio portion of the presentations are available in the course modules. Please contact the instructor if you need accommodations that are not provided.

F. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special
accommodations in order to participate, please contact AccessTECH with appropriate verification. “AccessTECH” is located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: http://www.accesstech.dsa.ttu.edu/default.asp

G. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction. **This includes opening of other websites during an exam.**

I. "Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class." Appropriate behavior online falls within this University guideline.

**Tentative Lecture Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Module Topic</th>
</tr>
</thead>
</table>
| WK 1 | Homepage and Syllabus Quiz  
History of the Interior Industry |
| WK 2 | Design I  
Design II  
Plant Material List 1 |
| WK 3 | Design III  
Plant Material List 2 |
| WK 4 | Environmental Concerns I  
Environmental Concerns II  
Plant Materials List 3 |
| WK 5 | Media  
Nutrients and Fertilizers |
Exam 1 (Lists 1-3)

WK 6  
Nutrients and Fertilizers  
Light I  
Plant Material List 4

WK 7  
Light II  
Installation  
Plant Material List 5

WK 8  
Maintenance  
Contracts I  
Plant Materials List 6

WK 9  
Contracts II  
Containers

Exam 2 (List 1-6)

WK 10  
Plant Growth and Quality Materials  
Poisonous Plants  
Plant Material List 7

WK 11  
Color Rotation  
Shipping and Receiving  
Plant Materials List 8

WK 12  
Acclimatization  
Pests and Pesticide Usage  
Plant Material List 9

WK 13  
Exam 3 (list 1-9)  
Biological Control  
Diagnosis

WK 14  
Diseases I  
Plant Materials List 10  
Holiday

WK 15  
Diseases II  
Industry Trends  
Final Exam (List 1-10)
PSS 3317 Hybrid
Interior Plants
Tentative Syllabus

Lecture Instructor: Dr. Cynthia McKenney
Dept. of Plant and Soil Science
Phone: 806-835-0722
Fax: 806-742-0775
e-mail: cynthia.mckenny@ttu.edu

Lab Instructor: Ms. Summer Loneragan
Dept. of Plant and Soil Science
Phone: TBA
Fax: 806-742-0775
e-mail: summer.loneragan@ttu.edu

Class Location: Lecture: This undergraduate level course is offered as a hybrid with the lecture content on the internet using the Texas Tech University Blackboard portal. The URL for this course is: www.blackboard.ttu.edu

Lab: The laboratory content offered at the University Greenhouse in GH105. Lecture time is asynchronous; however, your laboratory is scheduled for Tuesday from 2:00-3:20.

Exams: Online testing will be conducted in the basement of the library during your normally scheduled laboratory time.

I. Course Description:

The focus of this course is the physiological principles and industry practices in the production, moving, care, and maintenance of interior plants. This course will provide students the career tools to design, install and maintain interior plantscapes. This goal will be accomplished through the review of the pertinent literature and through class exercises designed to improve your skills and
knowledge of interior plant physiology, care and maintenance.

II. Course Purpose:

The overarching purpose of this course is to introduce you the student to the interior plant industry and to develop an appreciation and understanding of foliage plant physiology and growth. This undergraduate level course is a frequently selected course for a B.S. in Horticulture.

III. Text: Lecture - No lecture text is required
Lab - Reference will be the online database of plant materials available at http://www.pssc.ttu.edu/interiorscape/START.HTM

IV. References Used for This Class that may be Available at Your Library or by Interlibrary Loan from Texas Tech:
A. *Interior Plantscapes* – Manaker
B. *Flowering and Foliage Plant Book* - J. Henry
C. *Interior Landscaping* - Furuta
D. *Interior Plantscaping* - Gaines
E. *Garden Plants and Flowers* - Hays

V. Expected Learning Outcomes:
Upon completion of this course, you will be able to:

A. Demonstrate knowledge of the impact of environmental conditions on the growth and maintenance of interior plants.
B. Demonstrate knowledge of foliage plant physiology and maintenance.
C. Analyze current issues in the industry and supply plausible solutions.
D. Learn the growth and culture of over 150 foliage plants.
E. Become familiarized with the tropical plant families.
F. Evaluate existing interior installations and pose plausible solutions.

VI. Methods for Assessing the Expected Learning Outcomes:
The expected learning outcomes for the course will be assessed through several of the following methods: exams, content
application exercises, daily quizzes, class discussion using the discussion board, writing assignments, and projects.

VII. **Course Assignments and Grading Procedures:**

A. **Hourly Exams:** There will be four hourly exams worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, short answer and essay. Exam dates are listed in the Course Schedule. The fourth exam will be your final exam and it will not be comprehensive.

1. Grading on the listing questions will be as follows:
   - 2 pts for each plant
   - 1 pt for scientific name
   - 1 pt for spelling

2. Essay and short answer questions will be graded on the following:
   - 70% content
   - 30% grammar and spelling

Exams will be taken in the basement of the library. If for any reason you miss an exam, you must make arrangements for a makeup exam within three days or I will record a zero for your score. Make an appointment to take your exam early and check with your proctor before the exam date to be sure they have received your testing credentials to access the exam. Be sure none of your communications by e-mail use the term password as this will relegate your mail to the trash /spam folder of most computers.

B. **Virtual Field Trip Assignments:** There will be 2 discussion assignments during the semester in which you will have the opportunity to complete design critiques by traveling to a local facility, taking an image of the design and critiquing the physical accommodations, plant selection, lighting and plant maintenance level. Identify the highlights of the design and also include suggestions for improvement. Post your discussions in the blog area provided. It should be a minimum of one page and a maximum of 2 pages. In addition, respond to two of your classmates postings by critiquing their posts. In order to count as a response, your responding post must
be a minimum of 10 sentences in total. The response must be on topic, professional, and insightful. You will be graded on the number and quality of posting/responses you provide with each set of postings worth 50 pts. The grading is based on:

<table>
<thead>
<tr>
<th>Posting Content</th>
<th>30 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
<td>2 @10pts 20 pts</td>
</tr>
<tr>
<td>Total</td>
<td>50 pts</td>
</tr>
</tbody>
</table>

C. **Plant Identification Exams and Quizzes**: There will be 9 plant identification quizzes completed throughout the course with each quiz being worth 30 points. You will demonstrate your knowledge of the plant family, scientific name and common name for a series of plants. Plants will be cumulative throughout the semester. These quizzes will be taken online but do not need to be proctored. A minimal time limit will be enforced as this is not designed to be open book.

Likewise, there will be plant ID questions on your hourly exams, thus, please stay current on your plants as you prepare for you hourly exam. ½ credit will be deducted for spelling or capitalization error.

D. **Student Homepage**: You will complete the student homepage by providing a picture, a few lines about yourself including your location during the class (this is not an address), career, and future career aspirations. The course is password protected so only class members will have access to the site. The homepages will allow you to get to know each of your virtual peers a bit more easily and will allow you to practice your skills at uploading materials and complete online assignments. Your homepage is due the seventh day after the course officially begins and is noted on the course calendar. It will be worth 15 points.

Grading will be as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image</td>
<td>3 pts</td>
</tr>
<tr>
<td>Name, classification</td>
<td>3 pts</td>
</tr>
<tr>
<td>Major, hometown</td>
<td>3 pts</td>
</tr>
<tr>
<td>Plans for the future</td>
<td>3 pts</td>
</tr>
<tr>
<td>Fun fact about themselves</td>
<td>3 pts</td>
</tr>
</tbody>
</table>
F. **Syllabus Quiz:** In order to help familiarize yourself with Blackboard 9.1 and the parameters of the course, you will be provided with a syllabus quiz located in the assessment section of the course. Please complete the quiz during the first week of the class. You will have 3 attempts at the quiz and the highest score will be recorded. This quiz will be worth 15 points.

VIII. Grades:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Homepage and Quiz</td>
<td>2@</td>
<td>15 pts.</td>
<td>30</td>
</tr>
<tr>
<td>Hourly Exams</td>
<td>4@</td>
<td>100 pts.</td>
<td>400</td>
</tr>
<tr>
<td>Plant I.D. Quizzes</td>
<td>9@</td>
<td>30 pts.</td>
<td>270</td>
</tr>
<tr>
<td>Virtual Field Trip Postings</td>
<td>2@</td>
<td>50 pts.</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>800</strong></td>
</tr>
</tbody>
</table>

IX. Point Distribution:

\[
\begin{align*}
A & = 800 - 720 \\
B & = 719 - 640 \\
C & = 639 - 560 \\
D & = 559 - 480 \\
F & = 479 and below
\end{align*}
\]

X. **General Information:**

A. All late work will have **10 % deducted for each day or part of a day** it is late.

B. If you miss an exam for any reason, you must contact the instructor and make appropriate arrangements within 3 days or a score of "0" will be recorded. Makeup exams will be taken at the Academic Testing Service or with your proctor depending on your location. It is your responsibility to book the time and convey that information to the instructor so that an exam will be available for you when you arrive.

C. There will be no extra credit offered in this course. Please do not request any.

D. You will have about 15 to 20 plants a week to learn. It is important to keep up daily as the number of plants builds up quickly.
E. Due to the nature of this course, it includes both audio and visual components. The images of the interior designs and laboratory plant materials will not be accessible to those who are visually impaired. The scripts for the audio portion of the presentations are available in the course modules. Please contact the instructor if you need accommodations that are not provided.

F. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact AccessTECH with appropriate verification. “AccessTECH” is located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: http://www.accesstech.dsa.ttu.edu/default.asp

G. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction. This includes opening of other websites during an exam.

I. “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class." Appropriate behavior online falls within this University guideline.

**Tentative Lecture Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Module Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>WK 1</td>
<td>Homepage and Syllabus Quiz</td>
</tr>
<tr>
<td></td>
<td>History of the Interior Industry</td>
</tr>
</tbody>
</table>
WK 2  Design I  
Design II  
Plant Material List 1

WK 3  Design III  
Plant Material List 2

WK 4  Environmental Concerns I  
Environmental Concerns II  
Plant Materials List 3

WK 5  Media  
Nutrients and Fertilizers  
**Exam 1 (Lists 1-3)**

WK 6  Nutrients and Fertilizers  
Light I  
Plant Material List 4

WK 7  Light II  
Installation  
Plant Material List 5

WK 8  Maintenance  
Contracts I  
Plant Materials List 6

WK 9  Contracts II  
Containers  
**Exam 2 (List 1-6)**

WK 10  Plant Growth and Quality Materials  
Poisonous Plants  
Plant Material List 7

WK 11  Color Rotation  
Shipping and Receiving  
Plant Materials List 8

WK 12  Acclimatization  
Pests and Pesticide Usage  
Plant Material List 9
WK 13  **Exam 3 (list 1-9)**
    Biological Control
    Diagnosis

WK 14  Diseases I
    Plant Materials List 10
    Holiday

WK 15  Diseases II
    Industry Trends
    **Final Exam (List 1-10)**
I. **Instructor:**
Dr. Dick Auld  
Rockwell Professor - Plant & Soil Science Dept.  
Texas Tech University  
Food Tech 204A  
Lubbock, TX 79409-2123  
Phone: 806-742-5704  
E-mail: dick.auld@ttu.edu  
Office Hours: 11:00 to 11:30 TTh or by Appointment

II. **Course Description:**
This course provides practical application of genetics and biotechnology in the breeding and improvement of plants.

III. **Course Purpose:**
The objective of this class is to:

a. Understand how to apply genetic principles to plant improvement.

b. Understand conventional plant breeding methods and new technologies that are used in the development of new germplasm and varieties of agronomic and horticultural plants.

IV. **Optional Text:**
Breeding Field Crops, 1995 (Fifth Edition) by John M. Poehlman and David A. Sleper, Iowa State University (Optional).

V. **Expected Learning Outcomes:**
Upon completion of this course, the student will be able to:

a. Demonstrate the ability to apply genetic principles to plant improvement.

b. Demonstrate the ability to understand how biotechnology can enhance plant improvement.

c. Demonstrate the ability to prepare a comprehensive plant improvement program supported by scientific publications.

V. **Methods for Assessing the Expected Learning Outcomes:**
The expected learning outcomes for the course will be assessed through several of the following methods: course participation, take home tests, and a final term project.
VII. **Grading/Point Distribution:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
</tr>
<tr>
<td>B</td>
<td>80-89%</td>
</tr>
<tr>
<td>C</td>
<td>70-79%</td>
</tr>
<tr>
<td>D</td>
<td>60-69%</td>
</tr>
<tr>
<td>F</td>
<td>0-59%</td>
</tr>
</tbody>
</table>

Students are expected to attend all classes unless excused prior to the class by the instructor. Roll will be taken every class period. Students are allowed 3 unexcused absences. Please send the instructor an e-mail if you want an excused absence. **Students with 4 or more unexcused absences are subject a reduction in the final grade.**

**Graded Assignments will include the following:**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal Exams &amp; Pop Quizzes</td>
<td>300 pts</td>
</tr>
<tr>
<td>Term Project</td>
<td>100 pts</td>
</tr>
</tbody>
</table>

**Total possible Pts.** 400 pts

The **Term Project** will be a 10 to 12 page paper that each student will prepare that describes a complete plant improvement program on a plant species jointly approved by both the student and the instructor. The paper will use a minimum of ten scientific citations to describe the gene(s) that impact the traits targeted; the biochemistry of the trait; and the impact it will have on commercial production. This paper will also include a flow chart that shows how the program will be conducted over time. The paper will be typed and evaluated on grammar, spelling, composition as well as scientific merit. The paper will be due on Thursday, April 17th.

VII. **General Information:**

Exam and quiz questions will come from lecture notes, class discussions, handouts, and assigned reading materials. Exam questions will primarily be short answer, problems, and short discussions in format. If at any time you have questions, please do not hesitate to contact me. You may 1) see me before or after class; 2) set up an appointment during office hours; or 3) just come by my office at 204A in the Food Tech Building.
VIII. **Expected Learning Outcomes and Assessment:**

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon completion of this course, the students will be able to:</td>
<td>As measured by:</td>
</tr>
<tr>
<td>Describe the genetic system and manipulation of major crop species across the globe.</td>
<td>Exams, quizzes, homework assignments, class discussions and term assignments.</td>
</tr>
<tr>
<td>Identify the main reproductive components of the plant and explain their function(s).</td>
<td>Exams, quizzes, homework assignments, class discussions, and term assignments.</td>
</tr>
<tr>
<td>Design a program to genetically improve a selected crop species</td>
<td>Exams, quizzes, homework assignments, class discussions, and term assignments.</td>
</tr>
<tr>
<td>Discuss the genetic composition of plants and how such interacts with the environment (soil and climate) to affect plant growth, reproduction, and crop improvement.</td>
<td>Exams, quizzes, homework assignments, class discussions, and term assignments.</td>
</tr>
<tr>
<td>Demonstrate the ability to prepare a comprehensive written paper and oral presentation that that describes some emerging area of plant improvement with the support of scientific publications.</td>
<td>Class discussions and term assignments.</td>
</tr>
</tbody>
</table>

IX. **Course Policies:**

**Assignments:**
- All assignments and presentations are due on the expected due date.
- Late assignments will not be accepted.
- All written assignments must be typed and follow instructor's style guideline.
- All assignments are expected to be stylistically and grammatically appropriate for the assignment.
- Please keep records of all your work (attendance, discussion posts, etc.) until you receive your final grade for the course.

**Academic Integrity:** "It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension." (2012-13 Texas Tech University Catalog, p.56). Plagiarism will result in an immediate "F" for the course and may result in dismissal from Texas Tech University. **Cheating** can be defined as: dishonesty on written assignments.
Class Meeting Attendance and Participation: Because of the nature of this course, your participation is necessary for each class meeting. Your contribution is essential to achieving the stated learning outcomes. Therefore, your attendance and participation are required. More than one unexcused absences will result in your grade lowered by one letter grade. Please notify the instructor before class if you will be absent. However, simply notifying the instructor of an upcoming absence does not necessarily mean that you will be excused (an excused absence is up to the discretion of the course instructor). Only in extreme circumstances will students be permitted to receive a deadline extension on their assigned course work.

Announcements and Class Information: Students are expected to adapt to any changes in due dates, readings and schedules. If you miss a class meeting, you are responsible for obtaining any information disseminated during that class. Students should watch Blackboard for important announcements regarding deadline changes and/or campus activities.

Class Meeting Etiquette: Arriving on time and having read the assignments before class meetings is expected. This demonstrates respect for the learning community we are creating for one another. Supporting one another in dialogue is also encouraged. In class meetings, we want to hear your opinions and ideas and those of others are to be respected and acknowledged even if you disagree with them. Although the instructor will provide lectures on course material, other teaching methods will be used from time to time, which will require a considerable amount of participation and discussion on your part; here is when you have an opportunity to really demonstrate your knowledge and receive valuable participation points.

American's with Disabilities Act: Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor within the first week or two of the semester to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.

Observance of a religious holy day: Texas House Bill 256 requires institutions of higher education to excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day. The student shall also be excused for time necessary to travel. An institution may not penalize the student for the absence and allows for the student to take an exam or complete an assignment from which the student is excused. No prior notification of the instructor is required.

Technical Assistance:
IT Help Central is available to assist with eRaider sign-in problems, browser errors, and other technical difficulties you may encounter. For technical assistance, please contact IT Help Central at (806) 742-HELP, email them at ithelpcentral@ttu.edu, or visit the IT Help Central website at www.ithelpcentral.ttu.edu.
For student assistance with Blackboard, visit the Blackboard Student Support website at: http://www.tlpd.ttu.edu/content/asp/blackboard/SupportStudent.asp
PSS 3324/5326--SEED SCIENCE/ADVANCED SEED SCIENCE

1. **Instructor:** Norman W. Hopper
   Office: Goddard Range, Wildlife, and Fisheries Bldg.- Room 108 I
   Phone: 742-2808 (Office- TTU)
   792-3947 (Home)
   Office Hours: By appointment
   E-mail : n.hopper@ttu.edu

2. **Course Description:** Examination of seed morphology, anatomy, and chemistry. A study of the germination, emergence, and dormancy processes in seed in addition to various quality aspects—vigor, longevity, deterioration, etc. Genetically engineered seeds and other hot topics in seed science will also be included.

3. **Course Purpose:** The purpose of this course is to introduce students to the basic facets of seed science. This will include an in-depth study of the physical and chemical components of the different types of seeds along with the sequence of events in seed development. In addition, the basic principles of seed viability and vigor will be introduced along with their application to seed germination and seedling establishment. A discussion of seed dormancy, seed longevity, seed deterioration, and seed drying will be included to enhance the understanding of these concepts.

4. **Capstone Status:** NA

5. **Text:** Strongly recommended: Principles of Seed Science and Technology—Fourth Edition (Copeland and McDonald)

6. **Expected Learning Outcomes and Assessments:**

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upon completion of this course, the students will be able to:</td>
<td>As measured by</td>
</tr>
<tr>
<td>Identify the major morphological and anatomical components of the different types of seeds (monocots and dicots).</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
<tr>
<td>Describe the main chemical components of seeds (lipids, carbohydrates, proteins, etc.).</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
<tr>
<td>Outline the steps in seed development from early cell differentiation through mature seed formation and maturation.</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Explain the phenomenon of dormancy and the different types.</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
<tr>
<td>Discuss the concept of seed viability and vigor and their relationship to seed germination and seedling establishment.</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
<tr>
<td>Describe the events that occur as seed deteriorate and the relationship to seed longevity.</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
<tr>
<td>Explain the effects of time, temperature and humidity on the drying of seed.</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
<tr>
<td>Perform calculations to determine seeding rate.</td>
<td>Exams, quizzes, homework assignments, class discussions, and polling the class.</td>
</tr>
</tbody>
</table>

### 7. Course Assignments and Grading Procedures:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>PSS 3324</th>
<th>PSS 5326</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments/Quizzes (10 @ 10 pts. each)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Hour Exams (2 @ 100 pts. each)</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Article Critiques (2 @ 50 pts. each)</td>
<td>100</td>
<td>NA</td>
</tr>
<tr>
<td>Term Paper</td>
<td>NA</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam (Date—TBA &amp; comp.)</td>
<td>150</td>
<td>150</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>550</strong></td>
<td><strong>550</strong></td>
</tr>
</tbody>
</table>

### 8. Point Distribution:

- **A=** 90 – 100%
- **B=** 80 – 89%
- **C=** 70 – 79%
- **D=** 60 – 69%
- **F=** <60%

### 9. General Information:

- **Meeting:** Distance
- **Prerequisites:** None (PSS 1321 or other introductory plant science course desirable)
Notice:
Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.

Absence due to religious observance - The Texas Tech University Catalog states that a student shall be excused from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.

Absence due to officially approved trips – The Texas Tech University Catalog states that the person responsible for a student missing class due to a trip should notify the instructors of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missed.

10. Exams:
   Exam Dates- To be announced (at least one week in advance)
   Exams may be exclusively or a combination of multiple choice, matching, fill-in-the-blank, definitions, short answer, problems, and discussion questions.

   Make-Up Exams: By prior arrangement of instructor if on official University business or due to a religious observance.

11. Course Topics
   Seed morphology and anatomy
   Seed chemistry and composition
   Seed formation and development
   Seed germination and seedling establishment
   Seed dormancy / Seed viability and viability testing
   Seed and seedling vigor
   Seed longevity and deterioration / Seed drying
   Seed laws and certification
   Genetically engineered seeds
Syllabus for Forages and Livestock in Pasture Ecosystems PSS 5328

Instructor: Dr. Charles P. West, Phone 806-742-1625, Food Technology 101B
E-mail: chuck.west@ttu.edu.
Office Hours: By arrangement. Usually available from MWF 1:00-5:00, TT all day.

Course Description:
Class time: MWF 9:00-9:50
PSS 5328 Forage and Pasture Crops (3:3:0) The production and use of forage plant species used for pasture, hay and silage in the U.S., with emphasis on introduced species in and around Texas. The agronomy and ecology of forage growth, development, production, nutritional quality, and grazing systems. Design of forage systems in relation to available resources and livestock production goals. Cross-listed with PSS 3321.

Course Goals and Student Outcomes:
The goals are to provide students with the scientific background that explains how to produce and manage forage crops and grazing systems that are economically profitable, meet goals for soils, plants and animals, and that are compatible with local natural resources. This course builds on material in Agronomic Plant Science (PSS 1321), Principles and Practices in Soils (PSS 2432), and complements material in Crop Physiology (PSS 3323) and Crop Water Management (PSS 4325).
Successful students will be able to do the following:
1. Explain how forage growth processes affect forage management and quality.
2. Describe techniques for forage cultivar selection, stand establishment, pasture renovation, fertilization and weed control.
3. Present guidelines for designing and managing grazing systems
4. Explain forage quality as determined by chemical composition, environment and management practices.
5. Describe techniques of hay and silage production and storage.


Other References:
Terminology: See Glossary in the back of the textbook.
Arkansas Grazing Manual will be made available for downloading.

Lecture Format:
Traditional lecture using PowerPoint slides will be presented. Slide handouts in pdf format will be made available on Blackboard by midnight previous to the lecture. We will spend time in some periods doing lab-type demonstrations and problem-solving sessions. We will make at least one field trip to the research farm at New Deal for field demonstrations. There will be some problem-solving exercises requiring the use of a calculator and computer spreadsheet.
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<td>2</td>
<td>Jan 16</td>
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<td>Forage ecology in Texas</td>
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<td>3</td>
<td>Jan 21</td>
<td></td>
<td>Forage ecology in the US and World</td>
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<tr>
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<td>Quiz</td>
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<td>Chap. 2</td>
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<td>Chap. 2</td>
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<tr>
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<td>Nutrient cycling &amp; soil</td>
<td>Chap. 12, Handout</td>
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<td>Fertilizers</td>
<td>Chap. 12</td>
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<td>16</td>
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<td>Fertilizer calculations</td>
<td>Handout</td>
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<td>Feb 23</td>
<td>Quiz</td>
<td>Soil sampling &amp; fertilizer recommendations</td>
<td>Handout</td>
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<td>18</td>
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<td>Feb 27</td>
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<td>20</td>
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<td>Warm-season perennial grasses- WW-BDahl</td>
<td>Chap. 7, 11</td>
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<td>Exam</td>
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<td>23</td>
<td>Mar 9</td>
<td></td>
<td>Cool-season annual grasses</td>
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<td>24</td>
<td>Mar 11</td>
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<td>Legume forages</td>
<td>Chap. 7, 11</td>
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<tr>
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<td>Mar 13</td>
<td></td>
<td>Legume forages</td>
<td>Chap. 7, 11</td>
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<td></td>
<td>Mar 16-20</td>
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<td><strong>SPRING BREAK</strong></td>
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<td>26</td>
<td>Mar 23</td>
<td></td>
<td>Forage quality: general</td>
<td>Chap. 16, 17:393-4</td>
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<tr>
<td>27</td>
<td>Mar 25</td>
<td>Quiz</td>
<td>Forage quality: analysis</td>
<td>Chap. 16, 17:393-4</td>
</tr>
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<td>28</td>
<td>Mar 27</td>
<td>Quiz</td>
<td>Forage quality: analysis</td>
<td>Chap. 16, 17:393-4</td>
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<td>29</td>
<td>Mar 30</td>
<td></td>
<td>Animal disorders</td>
<td>Chap. 18</td>
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<td>30</td>
<td>Apr 1</td>
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<td>Animal disorders</td>
<td>Chap. 18</td>
</tr>
<tr>
<td>31</td>
<td>Apr 3</td>
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<td>Animal disorders</td>
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<td>32</td>
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<td>33</td>
<td>Apr 8</td>
<td>Exam</td>
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<tr>
<td>34</td>
<td>Apr 10</td>
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<td>Hay production</td>
<td>Chap. 19</td>
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<tr>
<td>35</td>
<td>Apr 13</td>
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<td>Hay production</td>
<td>Chap. 19</td>
</tr>
<tr>
<td>36</td>
<td>Apr 15</td>
<td></td>
<td>Silage production</td>
<td>Chap. 19</td>
</tr>
<tr>
<td>37</td>
<td>Apr 17</td>
<td></td>
<td>Silage production</td>
<td>Chap. 19</td>
</tr>
<tr>
<td>38, 39</td>
<td>Apr 22</td>
<td>Quiz</td>
<td>Grazing calculations, Pasture layout</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>40</td>
<td>Apr 24</td>
<td></td>
<td>Forage systems for cow-calf</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>41</td>
<td>Apr 27</td>
<td></td>
<td>Forage systems for cow-calf</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>42</td>
<td>Apr 29</td>
<td></td>
<td>Forage systems for stockers</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>43</td>
<td>May 1</td>
<td></td>
<td>Forage systems for dairy</td>
<td>Chap. 17:411-412</td>
</tr>
<tr>
<td>44</td>
<td>May 4</td>
<td></td>
<td>Forage systems for horses</td>
<td>Chap. 17:410-411</td>
</tr>
<tr>
<td>45</td>
<td>May 6</td>
<td></td>
<td>Review day</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>May 8</td>
<td>Exam</td>
<td>Final Exam 7:30-10:00 Since last exam, April 8 on</td>
<td></td>
</tr>
</tbody>
</table>
Assessment:
Hour exams and Final exam will be some essay and mostly multiple choice. There will be 5 quizzes. Each will consist of 20 points, and will only cover material since the last quiz or exam. There will be 3 hour exams. The final exam will cover the entire semester with emphasis on last half. Students will also write a paper on a special topic to be assigned early in the semester.

<table>
<thead>
<tr>
<th>Points</th>
<th>%</th>
<th>Grading scale:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (5 x 20 pt.)</td>
<td>100</td>
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<tr>
<td>Hour exams (3 x 100 pt)</td>
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<tr>
<td>Final exam</td>
<td>100</td>
<td>16.7</td>
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<tr>
<td>Graduate paper</td>
<td>100</td>
<td>16.7</td>
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<tr>
<td>Total</td>
<td>600</td>
<td>100</td>
</tr>
</tbody>
</table>

Internet resources – Class notes, syllabus, and some other handouts will be posted on Blackboard before class. My home page is http://www.orgs.ttu.edu/forageresearch/index.html. For another web page to find links to support the lecture material, I suggest you browse through the following web site: http://forages.oregonstate.edu/ This is the Forage Information System, a forage encyclopedia and rich source of information on forages. A good source of images of forages is the following: http://www.fao.org/ag/AGP/AGPC/doc/Gallery/pic.htm

Expectations:
1. It is important that you do your own work during quizzes and exams in this class. Evidence of collaboration on answers will be given an ‘F’ with no make-up examination.
2. You are welcome and encouraged to come and see me, call me, and contact me by e-mail if you need help or have questions or just want to discuss forages.
3. You are expected to attend classes with no more than three absences during the semester and to arrive in class on time. Please contact me ahead of time for school or work-related absences.
4. Eating, drinking, and use of cell phones are not allowed in this classroom.
5. Disruptive behavior is not tolerated and you will be excused from the classroom.
6. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from “AccessTECH” located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: http://www.accesstech.dsa.ttu.edu/default.asp
7. Contact me if you have special needs such as American Disabilities Act conditions, which includes hearing-impaired needs.
8. Inclement weather: Class will be canceled if the campus officially closes for inclement weather conditions.
Instructor: Dr. Charles P. West, Phone 806-742-1625, Food Technology 101B  
E-mail: chuck.west@ttu.edu. 
Office Hours: By arrangement. Usually available from MWF 1:00-5:00, TT all day.

Course Description:  
Class time: MWF 9:00-9:50  
PSS 3321 Forage and Pasture Crops (3:3:0) The production and use of forage plant species used for pasture, hay and silage in the U.S., with emphasis on introduced species in and around Texas. The agronomy and ecology of forage growth, development, production, nutritional quality, and grazing systems. Design of forage systems in relation to available resources and livestock production goals. Cross-listed with PSS 5328.

Course Goals and Student Outcomes:  
The goals are to provide students with the scientific background that explains how to produce and manage forage crops and grazing systems that are economically profitable, meet goals for soils, plants and animals, and that are compatible with local natural resources. This course builds on material in Agronomic Plant Science (PSS 1321), Principles and Practices in Soils (PSS 2432), and complements material in Crop Physiology (PSS 3323) and Crop Water Management (PSS 4325).
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4. Explain forage quality as determined by chemical composition, environment and management practices.
5. Describe techniques of hay and silage production and storage.


Other References:
Terminology: See Glossary at the back of the textbook.

Lecture Format:
Traditional lecture using PowerPoint slides will be presented. Slide handouts in pdf format will be made available on Blackboard by midnight previous to the lecture. We will spend time in some periods doing lab-type demonstrations and problem-solving sessions. We will make at least one field trip to the research farm at New Deal for field demonstrations. There will be some problem-solving exercises requiring the use of a calculator and computer spreadsheet.
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<td>Jan 30</td>
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<td>9</td>
<td>Feb 4</td>
<td></td>
<td>Nitrogen fixation and inoculation</td>
<td>Chap. 4 p. 85-87</td>
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<tr>
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<td>24</td>
<td>Mar 11</td>
<td></td>
<td>Legume forages</td>
<td>Chap. 7, 11</td>
</tr>
<tr>
<td>25</td>
<td>Mar 13</td>
<td></td>
<td>Legume forages</td>
<td>Chap. 7, 11</td>
</tr>
<tr>
<td></td>
<td>Mar 16-20</td>
<td></td>
<td>SPRING BREAK</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Mar 23</td>
<td></td>
<td>Forage quality: general</td>
<td>Chap. 16, 17:393-4</td>
</tr>
<tr>
<td>27</td>
<td>Mar 25</td>
<td>Quiz</td>
<td>Forage quality: analysis</td>
<td>Chap. 16, 17:393-4</td>
</tr>
<tr>
<td>28</td>
<td>Mar 27</td>
<td></td>
<td>Forage quality: analysis</td>
<td>Chap. 16, 17:393-4</td>
</tr>
<tr>
<td>29</td>
<td>Mar 30</td>
<td></td>
<td>Animal disorders</td>
<td>Chap. 18</td>
</tr>
<tr>
<td>30</td>
<td>Apr 1</td>
<td></td>
<td>Animal disorders</td>
<td>Chap. 18</td>
</tr>
<tr>
<td>31</td>
<td>Apr 3</td>
<td></td>
<td>Animal disorders</td>
<td>Chap. 18</td>
</tr>
<tr>
<td>32</td>
<td>Apr 6</td>
<td>NoClass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Apr 8</td>
<td>Exam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Apr 10</td>
<td></td>
<td>Hay production</td>
<td>Chap. 19</td>
</tr>
<tr>
<td>35</td>
<td>Apr 13</td>
<td></td>
<td>Hay production</td>
<td>Chap. 19</td>
</tr>
<tr>
<td>36</td>
<td>Apr 15</td>
<td></td>
<td>Silage production</td>
<td>Chap. 19</td>
</tr>
<tr>
<td>37</td>
<td>Apr 17</td>
<td></td>
<td>Silage production</td>
<td>Chap. 19</td>
</tr>
<tr>
<td></td>
<td>Apr 21</td>
<td></td>
<td>Grazing concepts</td>
<td>Chap. 17:402; Ch. 20</td>
</tr>
<tr>
<td>38, 39</td>
<td>Apr 22</td>
<td>Quiz</td>
<td>Grazing calculations, Pasture layout</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>40</td>
<td>Apr 24</td>
<td></td>
<td>Forage systems for cow-calf</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>41</td>
<td>Apr 27</td>
<td></td>
<td>Forage systems for cow-calf</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>42</td>
<td>Apr 29</td>
<td></td>
<td>Forage systems for stockers</td>
<td>Chap. 20</td>
</tr>
<tr>
<td>43</td>
<td>May 1</td>
<td></td>
<td>Forage systems for dairy</td>
<td>Chap. 17:411-412</td>
</tr>
<tr>
<td>44</td>
<td>May 4</td>
<td></td>
<td>Forage systems for horses</td>
<td>Chap. 17:410-411</td>
</tr>
<tr>
<td>45</td>
<td>May 6</td>
<td></td>
<td>Review day</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>May 8</td>
<td>Exam</td>
<td></td>
<td>Final Exam 7:30-10:00 Since last exam, April 8 on</td>
</tr>
</tbody>
</table>
Assessment:
Hour exams and Final exam will be some essay and mostly multiple choice. There will be 5 quizzes. Each will consist of 20 points, and will only cover material since the last quiz or exam. There will be 3 hour exams. The final exam will cover the entire semester with emphasis on last half.

<table>
<thead>
<tr>
<th>Points</th>
<th>%</th>
<th>Grading scale:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (5 x 20 pt.)</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Hour exams (3 x 100 pt)</td>
<td>300</td>
<td>60</td>
</tr>
<tr>
<td>Final exam (hour)</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td>100</td>
</tr>
</tbody>
</table>

Internet resources – Class notes, syllabus, and some other handouts will be posted on Blackboard before class. My home page is [http://www.orgs.ttu.edu/forageresearch/Index.html](http://www.orgs.ttu.edu/forageresearch/Index.html). For another web page to find links to support the lecture material, I suggest you browse through the following website: [http://forages.oregonstate.edu/](http://forages.oregonstate.edu/) This is the Forage Information System, a forage encyclopedia and rich source of information on forages. A good source of images of forages is the following: [http://www.fao.org/ag/AGP/AGPC/doc/Gallery/pic.htm](http://www.fao.org/ag/AGP/AGPC/doc/Gallery/pic.htm)

Expectations:
1. It is important that you do your own work during quizzes and exams in this class. Evidence of collaboration on answers will be given an ‘F’ with no make-up examination.
2. You are welcome and encouraged to come and see me, call me, and contact me by e-mail if you need help or have questions or just want to discuss forages.
3. You are expected to attend classes with no more than three absences during the semester and to arrive in class on time. Please contact me ahead of time for school or work-related absences. Students who skip class do poorly on quizzes and exams because they miss the extra information and nuances I provide in lecture and our discussions.
4. Eating, drinking, and use of cell phones are not allowed in this classroom.
5. Disruptive behavior is not tolerated and you will be excused from the classroom.
6. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from “AccessTECH” located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: [http://www.accesstech.dsa.ttu.edu/default.asp](http://www.accesstech.dsa.ttu.edu/default.asp)
7. Contact me if you have special needs such as American Disabilities Act conditions, which includes hearing-impaired needs.
8. Inclement weather: Class will be canceled if the campus officially closes for inclement weather conditions.
I. Instructor
Dr. Theo Udeigwe, Room 206 Plant and Soil Science Building, 806-742-2838, ext. 223
e-mail: Students should use the Blackboard e-mail function specific to this course.

Office Hours: By appointment.

II. Course Description
PSS 4330/5330: Environmental Soil Chemistry/Advanced Soil Chemistry (3:3:0).
Prerequisite: PSS 2432. Chemistry of inorganic and organic soil components with emphasis on environmental significance of solution-solid phase equilibria, sorption phenomena in soil systems, organic matter chemistry, ion exchange, oxidation-reduction reactions, and chemistry of soil acidity and salinity.

Lecture: Tuesday and Thursday 9:30-10:50, Plant and Soil Science Building Room 109

III. Course Purpose
Our purpose is to discuss important soil chemical components and processes as they apply to soil and water systems. Organic and inorganic components of soil and their interactions will be emphasized. Students will develop a better understanding of soil chemical processes and their applications to agricultural systems and environmental quality.

IV. Course Materials:
Supplemental Materials: Lectures, lecture notes, class discussion and other supplemental materials that will be available on the Blackboard site for the course.
Readings: Students are expected to keep up with assigned reading. Readings are shown on the course schedule and are taken from the text and other sources (where applicable).

V. Expected Learning Outcomes
Students will demonstrate through performance on written examinations, quizzes, and homework assignments their ability to apply the knowledge of soil chemistry to solve problems in the fields of agricultural and natural sciences, physical sciences and engineering.

VI. Methods for Assessing Expected Learning Outcomes
Learning outcomes will be assessed by a) quizzes, b) closed-book examinations, and c) homework assignments/projects.
### VII. Grading Procedures

**Activity Potential Points†**

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>Potential Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (10)</td>
<td>100</td>
</tr>
<tr>
<td>Examinations (2)</td>
<td>200</td>
</tr>
<tr>
<td>Homework Assignment (All students) (2)</td>
<td>30</td>
</tr>
<tr>
<td>Final, Cumulative Examination (1)</td>
<td>150</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>480</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graduate</th>
<th>Potential Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes (10)</td>
<td>100</td>
</tr>
<tr>
<td>Examinations (2)</td>
<td>200</td>
</tr>
<tr>
<td>Homework Assignment (All students) (2)</td>
<td>30</td>
</tr>
<tr>
<td>Extra Homework Assignments (Graduate) (3)</td>
<td>45</td>
</tr>
<tr>
<td>Final, Cumulative Examination (1)</td>
<td>150</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>525</strong></td>
</tr>
</tbody>
</table>

†Exam objectives will be posted on Blackboard for each exam. These exam objectives will provide a structure for your reading of the textbook, reviewing class notes and lectures. The exam objectives will be your best guides when studying for the quizzes and exams.

No makeup exams will be allowed, except in extreme and unusual cases, which will be considered on a case-by-case basis.

Attendance is strongly encouraged since most quizzes will be taken in class.

Grade Final Average needed
- **A** 90-100%
- **B** 80-89%
- **C** 70-79%
- **D** 60-69%
- **F** < 60%

### VIII. General Information

Policies

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may
0contact the Student Disability Services office in 335 West Hall or 806-742-2405.

"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Integrity and professionalism are expected of all students. Collaboration on assignments other than as specified, as well as any instance of “scholastic dishonesty” as described in OP 34.12 will not be tolerated. The guidelines set forth by the University will be followed with any infraction.

Students will be expected to check the class Blackboard site several days each week. The class Blackboard site will be used by the instructor as the primary location for announcements, accepting written submissions, and coordination of information between all sections of the class.
X. Tentative Course Schedule, Spring 2015
PSS 4330/5330: Environmental Soil Chemistry/Advanced Environmental Soil Chemistry

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic</th>
<th>Chapter Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 15</td>
<td>Introduction/Chemistry Review</td>
<td>Syllabus/Lecture</td>
</tr>
<tr>
<td>Jan 19-23</td>
<td>Inorganic Components of Soils</td>
<td>2</td>
</tr>
<tr>
<td>Jan 26-30</td>
<td>Inorganic Components of Soils/Organic Matter Chemistry</td>
<td>2 and 3</td>
</tr>
<tr>
<td>Feb 2-6</td>
<td>Organic Matter Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Feb 9-13</td>
<td>Soil Solution-Solid Phase Equilibria/Review</td>
<td>4</td>
</tr>
<tr>
<td>Feb 16-20</td>
<td><strong>Exam 1</strong></td>
<td></td>
</tr>
<tr>
<td>Feb 23-26</td>
<td>Sorption Phenomena in Soil Systems</td>
<td>5</td>
</tr>
<tr>
<td>March 2-6</td>
<td>Sorption Phenomena in Soil Systems/Ion Exchange</td>
<td>5 and 6</td>
</tr>
<tr>
<td>March 9-13</td>
<td>Ion Exchange/Kinetics of Chemical Processes</td>
<td>6 and 7</td>
</tr>
<tr>
<td>March 16-20</td>
<td><strong>Spring Break</strong></td>
<td></td>
</tr>
<tr>
<td>March 23-27</td>
<td>Redox Chemistry of Soils/Review</td>
<td>8</td>
</tr>
<tr>
<td>March 30-April 3</td>
<td><strong>Exam 2</strong></td>
<td></td>
</tr>
<tr>
<td>April 6-10</td>
<td>Chemistry of Soil Acidity</td>
<td>9</td>
</tr>
<tr>
<td>April 13-17</td>
<td>Chemistry of Soil Acidity/Soil Salinity</td>
<td>9 and 10</td>
</tr>
<tr>
<td>April 20-24</td>
<td>Soil Salinity</td>
<td>10</td>
</tr>
<tr>
<td>April 27-May 1</td>
<td>Final Exam Review</td>
<td></td>
</tr>
<tr>
<td>May 5</td>
<td>Independent Study</td>
<td></td>
</tr>
<tr>
<td>May 7</td>
<td><strong>Final Exam: May 7, 7:30-10:00 AM</strong></td>
<td></td>
</tr>
</tbody>
</table>
PSS 5331 – Advanced Plant Nutrient Management
Fall 2015
Tu – Th, 11:00 am – 12:20 pm
Blackboard Link: 201627-PSS-5331-001-Advanced Nutrient Management

INSTRUCTOR: Dr. Katie L. Lewis

Office(s):
Campus - Plant Science, 111C*, 806-834-6664
*office location after September 21st

Texas A&M AgriLife Research and Extension Center
1102 East FM 1294, Lubbock, TX 79403
(From I-27, take Exit 11, and go east ~½ mile)

Office hours:
Monday: by appointment
Tuesday*: 8:30 am - 10:30 am
Wednesday: by appointment
Thursday*: 8:30 am - 10:30 am
Friday: by appointment
*Office hours will vary from August 24th to September 21st due to construction; please contact me via email to make an appointment.

Phone: 361-815-3836 (cell)
E-mail: katie.lewis@ttu.edu

COURSE DESCRIPTION:
PSS 5331. Advanced Plant Nutrient Management (3). Prerequisite: PSS 2432. Evaluation and application of theory to plant nutrient management; a study of nutrient needs and nutrient reactions in soil; and predicting nutrient need and response.

COURSE PURPOSE:
1. Important soil chemical, biological and physical properties and their impacts on nutrient availability in plant production systems,
2. Nutrient acquisition and use by plants,
3. Nutrient cycling in soil-plant systems,
4. Nutrient analyses and recommendation,
5. Modern methods of nutrient management, and tools for maximizing nutrient use efficiency,
6. Agricultural sustainability and its impact on plant production, and
7. Nutrients in agricultural systems and impact on environmental quality.
TEXT:
2. Additional materials from alternate sources will be available on the Blackboard site and provided by the instructor when required.

EXPECTED LEARNING OUTCOMES:
1. Students will demonstrate through performance on written examinations, written essays, and a semester project their ability to apply theoretical knowledge within the fields of crop and soil science and horticulture,
2. Students will demonstrate the ability to communicate effectively in written form, as appropriate for an entry-level position within the fields of crop and soil science and horticulture,
3. Students will demonstrate technical and professional skills needed to function within a complex and global society through performance on assignments.

METHODS FOR ASSESSING EXPECTED LEARNING OUTCOMES:
The instructor will issue topic related problem sets, quizzes, exams, and written assignments, and expects student discussion and participation to assess learning outcomes.

Quizzes will be given unannounced at the beginning of class and will be turned in after approximately 5 min. Students will not be allowed to take any quiz after they have been taken up.

Problem sets consisting of soil-related calculations will be assigned.

Three writing assignments summarizing peer-reviewed journal articles relevant to course topics will be given during the semester. Each student will be required to write a short summary (one to two pages) of the article. Essays will be graded for content and quality of writing. Report deadlines are as follows: Report #1 – 1-Oct, Report #2 – 29-Oct, Report #3 – 24-Nov. All reports must be submitted in Blackboard. Students will be required to provide a brief oral presentation (10 minutes) for one of your reports on the date it is due. Presentation dates will be decided upon by graduate students. Distance students will complete one additional report summarizing a soil related journal article.

The semester project for PSS 5331 will be a combined problem-solving and writing assignment. Each student is required to turn in both a first and final draft of the report. The project will involve a real-world scenario. Assignment announcements and due dates will be communicated to students.

A comprehensive final exam will be administered in the classroom on Wednesday, Dec 9th from 1:30 pm to 4:00 pm.
GRADING:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance and Participation*</td>
<td>100</td>
</tr>
<tr>
<td>Exams (3 x 100)</td>
<td>300</td>
</tr>
<tr>
<td>Quizzes (5 x 10)</td>
<td>50</td>
</tr>
<tr>
<td>Problem Sets (3 x 50)</td>
<td>150</td>
</tr>
<tr>
<td>Reports (3 x 50)</td>
<td>150</td>
</tr>
<tr>
<td>Report Presentation</td>
<td>50</td>
</tr>
<tr>
<td>Semester Project</td>
<td>200</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
</tr>
</tbody>
</table>

TOTAL 1200

*Attendance and participation will be assessed throughout the semester. See section below for more details.

Course grades will be based on the percentage of 1200 possible points*:

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Percentage</th>
<th>Points Accumulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100</td>
<td>≥ 1080</td>
</tr>
<tr>
<td>B</td>
<td>80 - 89</td>
<td>960 - 1073</td>
</tr>
<tr>
<td>C</td>
<td>70 - 79</td>
<td>840 - 953</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69</td>
<td>720 - 833</td>
</tr>
<tr>
<td>F</td>
<td>≤ 59</td>
<td>≤ 713</td>
</tr>
</tbody>
</table>

*Attendance and in-class participation will be considered in assigning final grades.

GENERAL INFORMATION:

Students will be allowed to make up missed exams (not quizzes) if there is a valid reason (i.e. personal reason, University sponsored activity, etc.). Make-up exams must be completed within a week following the exam, unless specified differently by the instructor. Composition of make-up exams will be at the discretion of the instructor.

My role as an instructor is to help students learn the discipline of soil fertility and application of nutrient management. I will make every possible effort to facilitate students learning and encourage interaction and questions in class. In addition, I welcome any constructive criticism regarding my teaching style and/or the material covered.

Students will be expected to check the class Blackboard site several days each week. The class Blackboard site will be used by the instructor as the primary location for announcements, accepting written submissions, and coordination of information between all sections of the class.
ATTENDANCE:
Students are expected to attend each class and to be fully prepared to participate in lecture discussions. With the exception of religious holidays (see below) and pre-approved official TTU absences, there are no excused absences. There are approximately 28 scheduled class meetings this semester, thus approximately 3.6 points will be deducted from your accumulated points for each absence. Class participation will be used in the determination of final grades.

Observances of a religious holy day: Texas House Bill 256 requires institutions of higher education to excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day. The student shall also be excused for time necessary to travel. An institution may not penalize the student for the absence and allows for the student to take an exam or complete an assignment from which the student is excused. No prior notification of the instructor is required.

ACADEMIC REGULATIONS:
Please refer to the “Code of Student Conduct” and Student Handbook of Texas Tech University available at http://www.depts.ttu.edu/studentconduct/ for further information regarding student conduct.

This course is governed by the Texas Tech University academic integrity policy as elucidated at the following URL:

Academic Integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension. "Academic dishonesty" includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act. The Code of Student Conduct contains the definitions of Academic Integrity Code violations and can be accessed at http://www.depts.ttu.edu/dos/handbook/.

Cheating: Dishonesty on examinations, quizzes, or homework assignments; illegal possession of examinations, the use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry to or unauthorized presence in an office are instances of cheating.

Plagiarism: Offering the work of another as one’s own, without proper acknowledgement, is plagiarism; therefore any student who fails to give credit for quotations or an essentially identical expression of material taken from books, encyclopedias, magazines, and other reference works, or from the themes, reports, or other writings of a fellow student, is guilty of plagiarism.
STUDENTS WITH DISABILITIES:
The University is committed to the principle that in no aspect of its programs shall there be
differences in the treatment of persons because of race, creed, national origin, age, sex, or
disability, and that equal opportunity and access to facilities shall be available to all.

Any student who, because of a disability, may require special arrangements in order to meet the
course requirements should contact the instructor as soon as possible to make any necessary
arrangements. Students should present appropriate verification from Student Disability Services
during the instructor's office hours. Please note instructors are not allowed to provide classroom
accommodations to a student until appropriate verification from Student Disability Services has
been provided. For additional information, you may contact the Student Disability Services
office in 335 West Hall or 806-742-2405.
### TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Topic(s)</th>
<th>Textbook Chapter</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-Aug</td>
<td>1</td>
<td>Introduction &amp; Historical Background</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>27-Aug</td>
<td>2</td>
<td>Plant Essential Elements</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1-Sep</td>
<td>3</td>
<td>Soil-Plant Relationships</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3-Sep</td>
<td>4</td>
<td>Calculations in Soil Fertility</td>
<td></td>
<td>Problem Set #1 (assigned)</td>
</tr>
<tr>
<td>8-Sep</td>
<td>5</td>
<td>Soil Acidity and Alkalinity</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10-Sep</td>
<td>6</td>
<td>Soil Acidity and Alkalinity</td>
<td>3</td>
<td>Problem Set #1 (due)</td>
</tr>
<tr>
<td>15-Sep</td>
<td>7</td>
<td>Soil Acidity and Alkalinity</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>17-Sep</td>
<td>8</td>
<td><strong>EXAM I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22-Sep</td>
<td>9</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
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<tr>
<td>24-Sep</td>
<td>10</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
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<tr>
<td>29-Sep</td>
<td>11</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
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<tr>
<td>1-Oct</td>
<td>12</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
<td>Report #1 (due) - grad pres. (x2)</td>
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<tr>
<td>6-Oct</td>
<td>13</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
<td>Problem Set #2 (assigned)</td>
</tr>
<tr>
<td>8-Oct</td>
<td>14</td>
<td><strong>EXAM II</strong></td>
<td></td>
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<tr>
<td>13-Oct</td>
<td>15</td>
<td>Soil Phosphorus</td>
<td>5, 10</td>
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<td>15-Oct</td>
<td>16</td>
<td>Soil Phosphorus</td>
<td>5, 10</td>
<td>Problem Set #2 (due)</td>
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<tr>
<td>20-Oct</td>
<td>17</td>
<td>Soil Phosphorus</td>
<td>5, 10</td>
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<td>22-Oct</td>
<td>18</td>
<td>Soil Potassium</td>
<td>6</td>
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<td>27-Oct</td>
<td>19</td>
<td>Soil Potassium</td>
<td>6</td>
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<tr>
<td>29-Oct</td>
<td>20</td>
<td>Soil Potassium</td>
<td>6</td>
<td>Report #2 (due) - grad pres. (x2)</td>
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<tr>
<td>3-Nov</td>
<td>21</td>
<td>Sulfur, Calcium, and Magnesium</td>
<td>7</td>
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<tr>
<td>5-Nov</td>
<td>22</td>
<td>Micronutrients</td>
<td>8</td>
<td>Problem Set #3 (assigned)</td>
</tr>
<tr>
<td>10-Nov</td>
<td>23</td>
<td><strong>EXAM III</strong></td>
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<tr>
<td>12-Nov</td>
<td>24</td>
<td>Soil Fertility Evaluation</td>
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<td>17-Nov</td>
<td>25</td>
<td>Nutrient Management</td>
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<tr>
<td>19-Nov</td>
<td>26</td>
<td>Nutrient Management, Other</td>
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<td>Problem Set #3 (due)</td>
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<tr>
<td>24-Nov</td>
<td>27</td>
<td>Ag Production and the Environment</td>
<td>12</td>
<td>Report #3 (due) - grad pres. (x2)</td>
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<td>26-Nov</td>
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<td>Thanksgiving Holiday</td>
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<tr>
<td>1-Dec</td>
<td>28</td>
<td>Review</td>
<td></td>
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<tr>
<td>3-Dec</td>
<td></td>
<td>Independent Study</td>
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<tr>
<td>9-Dec</td>
<td></td>
<td><strong>Final Exam, 1:30 - 4:00 pm</strong></td>
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</table>
PSS 4335 – Soil Fertility and Nutrient Management
Fall 2015
Tu – Th, 11:00 am – 12:20 pm
Blackboard Link: 201627-PSS-4335-001-Soil Fertility Nutrient Mgmt

INSTRUCTOR: Dr. Katie L. Lewis
Office(s):
Campus - Plant Science, 111C*, 806-834-6664
*office location after September 21st

Texas A&M AgriLife Research and Extension Center
1102 East FM 1294, Lubbock, TX 79403
(From I-27, take Exit 11, and go east ~½ mile)

Office hours:
Monday: by appointment
Tuesday*: 8:30 am - 10:30 am
Wednesday: by appointment
Thursday*: 8:30 am - 10:30 am
Friday: by appointment
*Office hours will vary from August 24th to September 21st due to construction; please contact me via email to make an appointment.

Phone: 361-815-3836 (cell)
E-mail: katie.lewis@ttu.edu

COURSE DESCRIPTION:
PSS 4335. Soil Fertility and Nutrient Management (3). Prerequisite: PSS 2432.
Nutrient availability as influenced by soil properties, modern methods of nutrient management
and tools for maximizing nutrient use efficiency.

COURSE PURPOSE:
1. Important soil chemical, biological and physical properties and their impacts on
   nutrient availability in plant production systems,
2. Nutrient acquisition and use by plants,
3. Nutrient cycling in soil-plant systems,
4. Nutrient analyses and recommendation,
5. Modern methods of nutrient management, and tools for maximizing nutrient use
   efficiency,
6. Agricultural sustainability and its impact on plant production, and
7. Nutrients in agricultural systems and impact on environmental quality.

WRITING-INTENSIVE STATUS: This is a writing-intensive course
TEXT:
2. Additional materials from alternate sources will be available on the Blackboard site and provided by the instructor when required.

EXPECTED LEARNING OUTCOMES:
1. Students will demonstrate through performance on written examinations, written essays, and a semester project their ability to apply theoretical knowledge within the fields of crop and soil science and horticulture,
2. Students will demonstrate the ability to communicate effectively in written form, as appropriate for an entry-level position within the fields of crop and soil science and horticulture,
3. Students will demonstrate technical and professional skills needed to function within a complex and global society through performance on assignments.

METHODS FOR ASSESSING THE EXPECTED LEARNING OUTCOMES:
The instructor will issue topic related problem sets, quizzes, exams, and written assignments, and expects student discussion and participation to assess learning outcomes.

Quizzes will be given unannounced at the beginning of class and will be turned in after approximately 5 min. Students will not be allowed to take any quiz after they have been taken up.

Problem sets consisting of soil-related calculations will be assigned.

Two writing assignments summarizing peer-reviewed journal articles will be given during the semester. Journal articles will cover topics relevant to the course and each student will be required to write a short summary (one to two pages) of the article. Essays will be graded for content and quality of writing. Instructions will be provided with the assignments.

The semester project for PSS 4335 will be a combined problem-solving and writing assignment. Each student is required to turn in both a first and final draft of the report. The project will involve a real-world scenario. Assignment announcements and due dates will be communicated to students.

A comprehensive final exam will be administered in the classroom on Wednesday, Dec 9th from 1:30 pm to 4:00 pm.
GRADING:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance and Participation*</td>
<td>100</td>
</tr>
<tr>
<td>Exams (3 x 100)</td>
<td>300</td>
</tr>
<tr>
<td>Quizzes (5 x 10)</td>
<td>50</td>
</tr>
<tr>
<td>Problem Sets (3 x 50)</td>
<td>150</td>
</tr>
<tr>
<td>Reports (2 x 50)</td>
<td>100</td>
</tr>
<tr>
<td>Semester Project</td>
<td>200</td>
</tr>
<tr>
<td>Final Exam</td>
<td>200</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1100</strong></td>
</tr>
</tbody>
</table>

*Attendance and participation will be assessed throughout the semester. See section below for more details.

Course grades will be based on the percentage of 1100 possible points*:

<table>
<thead>
<tr>
<th>Course Grade</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 - 100</td>
<td>≥ 990</td>
</tr>
<tr>
<td>B</td>
<td>80 - 89</td>
<td>880 - 983</td>
</tr>
<tr>
<td>C</td>
<td>70 - 79</td>
<td>770 - 873</td>
</tr>
<tr>
<td>D</td>
<td>60 - 69</td>
<td>660 - 763</td>
</tr>
<tr>
<td>F</td>
<td>≤ 59</td>
<td>≤ 653</td>
</tr>
</tbody>
</table>

*Attendance and in-class participation will be considered in assigning final grades.

GENERAL INFORMATION:

Students will be allowed to make up missed exams (not quizzes) if there is a valid reason (i.e. personal reason, University sponsored activity, etc.). Make-up exams must be completed within a week following the exam, unless specified differently by the instructor. Composition of make-up exams will be at the discretion of the instructor.

My role as an instructor is to help students learn the discipline of soil fertility and application of nutrient management. I will make every possible effort to facilitate students learning and encourage interaction and questions in class. In addition, I welcome any constructive criticism regarding my teaching style and/or the material covered.

Students will be expected to check the class Blackboard site several days each week. The class Blackboard site will be used by the instructor as the primary location for announcements, accepting written submissions, and coordination of information between all sections of the class.

ATTENDANCE:

Students are expected to attend each class and to be fully prepared to participate in lecture discussions. With the exception of religious holidays (see below) and pre-approved official TTU absences, there are no excused absences. There are approximately 28 scheduled class meetings this semester, thus approximately 3.6 points will be deducted from your accumulated points for each absence. Class participation will be used in the determination of final grades.
**Observances of a religious holy day:** Texas House Bill 256 requires institutions of higher education to excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day. The student shall also be excused for time necessary to travel. An institution may not penalize the student for the absence and allows for the student to take an exam or complete an assignment from which the student is excused. No prior notification of the instructor is required.

**ACADEMIC REGULATIONS:**
Please refer to the “Code of Student Conduct” and Student Handbook of Texas Tech University available at [http://www.depts.ttu.edu/studentconduct/](http://www.depts.ttu.edu/studentconduct/) for further information regarding student conduct.

This course is governed by the Texas Tech University academic integrity policy as elucidated at the following URL: [www.depts.ttu.edu/studentaffairs/CampusCrime/documents/integritymatters.pdf](http://www.depts.ttu.edu/studentaffairs/CampusCrime/documents/integritymatters.pdf)

**Academic Integrity:** It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension. "Academic dishonesty" includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act. The Code of Student Conduct contains the definitions of Academic Integrity Code violations and can be accessed at [http://www.depts.ttu.edu/dos/handbook/](http://www.depts.ttu.edu/dos/handbook/).

**Cheating:** Dishonesty on examinations, quizzes, or homework assignments; illegal possession of examinations, the use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry to or unauthorized presence in an office are instances of cheating.

**Plagiarism:** Offering the work of another as one’s own, without proper acknowledgement, is plagiarism; therefore any student who fails to give credit for quotations or an essentially identical expression of material taken from books, encyclopedias, magazines, and other reference works, or from the themes, reports, or other writings of a fellow student, is guilty of plagiarism.
STUDENTS WITH DISABILITIES:
The University is committed to the principle that in no aspect of its programs shall there be
differences in the treatment of persons because of race, creed, national origin, age, sex, or
disability, and that equal opportunity and access to facilities shall be available to all.

Any student who, because of a disability, may require special arrangements in order to meet the
course requirements should contact the instructor as soon as possible to make any necessary
arrangements. Students should present appropriate verification from Student Disability Services
during the instructor's office hours. Please note instructors are not allowed to provide classroom
accommodations to a student until appropriate verification from Student Disability Services has
been provided. For additional information, you may contact the Student Disability Services
office in 335 West Hall or 806-742-2405.
<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Topic(s)</th>
<th>Textbook Chapter</th>
<th>Other</th>
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<tbody>
<tr>
<td>25-Aug</td>
<td>1</td>
<td>Introduction &amp; Historical Background</td>
<td>1</td>
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<tr>
<td>27-Aug</td>
<td>2</td>
<td>Plant Essential Elements</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1-Sep</td>
<td>3</td>
<td>Soil-Plant Relationships</td>
<td>2</td>
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<tr>
<td>3-Sep</td>
<td>4</td>
<td>Calculations in Soil Fertility</td>
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<td>Problem Set #1 (assigned)</td>
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<tr>
<td>8-Sep</td>
<td>5</td>
<td>Soil Acidity and Alkalinity</td>
<td>3</td>
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<tr>
<td>10-Sep</td>
<td>6</td>
<td>Soil Acidity and Alkalinity</td>
<td>3</td>
<td>Problem Set #1 (due)</td>
</tr>
<tr>
<td>15-Sep</td>
<td>7</td>
<td>Soil Acidity and Alkalinity</td>
<td>3</td>
<td></td>
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<tr>
<td>17-Sep</td>
<td>8</td>
<td><strong>EXAM I</strong></td>
<td></td>
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<tr>
<td>22-Sep</td>
<td>9</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
<td></td>
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<tr>
<td>24-Sep</td>
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<td>4, 10, 13</td>
<td></td>
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<tr>
<td>29-Sep</td>
<td>11</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
<td></td>
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<tr>
<td>1-Oct</td>
<td>12</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
<td>Report #1 (due)</td>
</tr>
<tr>
<td>6-Oct</td>
<td>13</td>
<td>Soil Nitrogen</td>
<td>4, 10, 13</td>
<td>Problem Set #2 (assigned)</td>
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<tr>
<td>8-Oct</td>
<td>14</td>
<td><strong>EXAM II</strong></td>
<td></td>
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<tr>
<td>13-Oct</td>
<td>15</td>
<td>Soil Phosphorus</td>
<td>5, 10</td>
<td></td>
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<td>15-Oct</td>
<td>16</td>
<td>Soil Phosphorus</td>
<td>5, 10</td>
<td>Problem Set #2 (due)</td>
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<tr>
<td>20-Oct</td>
<td>17</td>
<td>Soil Phosphorus</td>
<td>5, 10</td>
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<tr>
<td>22-Oct</td>
<td>18</td>
<td>Soil Potassium</td>
<td>6</td>
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<td>27-Oct</td>
<td>19</td>
<td>Soil Potassium</td>
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<td>20</td>
<td>Soil Potassium</td>
<td>6</td>
<td></td>
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<tr>
<td>3-Nov</td>
<td>21</td>
<td>Sulfur, Calcium, and Magnesium</td>
<td>7</td>
<td>Report #2 (due)</td>
</tr>
<tr>
<td>5-Nov</td>
<td>22</td>
<td>Micronutrients</td>
<td>8</td>
<td>Problem Set #3 (assigned)</td>
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<tr>
<td>10-Nov</td>
<td>23</td>
<td><strong>EXAM III</strong></td>
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<td>12-Nov</td>
<td>24</td>
<td>Soil Fertility Evaluation</td>
<td>9</td>
<td></td>
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<tr>
<td>17-Nov</td>
<td>25</td>
<td>Nutrient Management</td>
<td>10</td>
<td></td>
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<tr>
<td>19-Nov</td>
<td>26</td>
<td>Nutrient Management, Other</td>
<td>10</td>
<td>Problem Set #3 (due)</td>
</tr>
<tr>
<td>24-Nov</td>
<td>27</td>
<td>Ag Production and the Environment</td>
<td>12</td>
<td></td>
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<tr>
<td>26-Nov</td>
<td></td>
<td>Thanksgiving Holiday</td>
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<td>Review</td>
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<td></td>
<td>Independent Study</td>
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<td>9-Dec</td>
<td></td>
<td><strong>Final Exam, 1:30 - 4:00 pm</strong></td>
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</table>
I. Instructor:
Dr. Richard Zartman
Plant and Soil Science Department
Plant Science Room 263
Texas Tech University
Lubbock, TX 79409-2122
Phone: 806-742-1626
Fax: 806-742-0775
Email: richard.zartman@ttu.edu

Please note that this is the ONLY email address that I use.
Office Hours: MWF 8-11 AM or by appointment

II. Course Description:
Physical characteristics of soils and porous media and principles identifying flow and distribution of water, air and heat in soils.

III. Course Purpose:
The purpose of this class is to understand the physical characteristics of porous media and the principles underlying flow and distribution of water, air and heat in soils. This course provides students with advanced knowledge of the physical properties of soils. Students will be able to solve problems related to soil physical properties.

IV. Capstone Status:
This is not a capstone course.

V. Text:

General Text References:
Soil Physics. 3rd ed. L.D. Baver, John Wiley & Sons, Inc. The appropriate chapter will be emailed to you as a pdf.

VI. Expected Learning Outcomes:
After completing this course, students will be able to:

A. Determine the bulk and particle density and porosity of soil
B. Determine the gravimetric, volumetric, quantity of water in soils

C. Determine the basis for selection of the appropriate water content/potential measuring devices

D. Name the methods to quantify soil aeration

E. Name and classify components of geostatistics

F. Explain the role of soil physical properties in the environment.

VII. **Methods for Assessing the Expected Learning Outcomes:**

The expected learning outcomes for the course will be assessed through several of the following methods: Exams, writing assignments, and homework.

<table>
<thead>
<tr>
<th>Course Learning Outcomes and Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning outcome</td>
</tr>
<tr>
<td>A. Determine the bulk and particle density and porosity of soil</td>
</tr>
<tr>
<td>B. Determine the gravimetric, volumetric, quantity of water in soils</td>
</tr>
<tr>
<td>C. Determine the basis for selection of the appropriate water content/potential measuring devices</td>
</tr>
<tr>
<td>D. Name the methods to quantify soil aeration</td>
</tr>
<tr>
<td>E. Name and classify components of geostatistics</td>
</tr>
<tr>
<td>F. Explain the role of soil physical properties in the environment.</td>
</tr>
</tbody>
</table>

VIII. **Course Assignments and Grading Procedures:**

**Soil Physics Term Paper and Oral Report**

The Soil Physics term paper and oral report are 25% of the class grade. This report will need to be on some topic, of your choosing, which is directly related to the topic of Soil Physics. The topic will need to be chosen and submitted to me by **Friday, January 31st**. On **March 3**, the specific date for your oral report will be chosen at random. The oral report will need to be approximately 15 to 20 minutes in length. This length of time should allow two speakers per class period along with some time for questions. At the time you speak, you will need to turn in a 200 word abstract listing your name and topic. The term paper covering the same topic will be due **April 25**. The paper can be of any length that you feel appropriate (8-10 pages), it must have an abstract and a literature cited section.
IX. **Grades:**

Three Exams at 15% each 45%
Homework 5%
Paper and Report 25%
Comprehensive final 25%

**Tuesday, May 13 from 7:30 a.m. to 10:00 a.m.**

X. **Point Distribution:**

A= 90-100%
B= 80-89%
C= 70-79%
D= 60-69%
F= 0-59%

XI. **General Information:**

A. The class notes can be located at [www.blackboard.ttu.edu](http://www.blackboard.ttu.edu) on the Texas Tech University BlackBoard web site.
You will be asked for your eRaider name and password. Typical eRaider name is your first initial glued in front of your last name. Your password is eight random lettered/numbered sequence assigned by Texas Tech.

B. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405”.

C. “Students are expected to assist in maintaining a classroom environment which is conductive to learning. In order to assure that all students have an opportunity and gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from using cellular phones or beepers, eating or drinking in class, making offensive remarks, reading newspapers, sleeping or engaging in any
other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a request to leave class”.

D. This course is governed by the Texas Tech University academic integrity policy as elucidated at the following URL: http://www.depts.ttu.edu/studentjudicialprograms/PDF-WordFiles/IntegrityMatters.pdf.

You will be allowed to use calculators for the exams. The use of cell phones to take the exams is NOT permitted. Please note the cheating and plagiarism definitions on the above website.

For distance students, this course requires proctored exams. **Proctors must be approved by the Plant and Soil Science Department.** A list of college test centers that proctor exams is available at www.ncta-testing.org/cctc (click on find a participant; click on the state in which you need to find a testing location). Additional professionals eligible to proctor exams are academic counselors, librarians, military education officers or other pre-approved full-time education professionals. All proctors have a responsibility to facilitate fairness and maintain the academic integrity of the testing process. Therefore, the proctor may not have a personal relationship with the student. Any proctoring fees are the responsibility of the student and these fees will vary. The average range, however, is $20-$40 per exam.

Distance Students please let me know how you would like the exams to be handled. Typically, I email the exams to the student’s proctor. Have the proctor supervise the taking the exam. Have the proctor return the exam to me. This may be done by email, snail-mail, or FAX. The final is comprehensive. With the time lag for mail, I sometimes assign a grade of “X” until the final is received and graded and the final grade assigned. I’ll email you the homework assignments. You can return them by email or snail-mail.

For the on-campus students, there is an oral presentation and a written report. For off-campus students, the written report counts as two grades.

We can keep “in touch” by email. Use only the email address at the top of this document. **I do NOT use the email embedded within BlackBoard.** If we need to visit by phone, let me know a convenient time so that Texas Tech picks up the phone bill.

If you have questions, please let me know at the email or phone number at the top of this document.
### XII. Tentative Lecture Schedule

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
<th>Chapter/Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/15</td>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1/17</td>
<td>History</td>
<td>Baver 3rd Ed Ch. 1</td>
</tr>
<tr>
<td>3</td>
<td>1/22</td>
<td>Bulk Soil</td>
<td>Hillel 1, 5</td>
</tr>
<tr>
<td>4</td>
<td>1/24</td>
<td>Soil Texture</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>1/27</td>
<td>NO CLASS*</td>
<td>Jan-14</td>
</tr>
<tr>
<td>6</td>
<td>29-Jan</td>
<td>Surface Properties</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>1/31</td>
<td>Thermal Regime, I</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>2/3</td>
<td>NO CLASS*</td>
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<tr>
<td>9</td>
<td>2/5</td>
<td>Test 1</td>
<td>Feb 5</td>
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<td>10</td>
<td>2/7</td>
<td>Thermal Regime, II</td>
<td>12</td>
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<td>11</td>
<td>2/10</td>
<td>Thermal Regime, III</td>
<td>12</td>
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<td>12,13</td>
<td>2/12 &amp; 14</td>
<td>Aeration</td>
<td>10</td>
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<td>14</td>
<td>2/17</td>
<td>Water Properties</td>
<td>1 (13-14), 2</td>
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<tr>
<td>15</td>
<td>2/19</td>
<td>Soil-Water Content and Potential</td>
<td>6 (129-132 &amp; 142-154)</td>
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<tr>
<td>16</td>
<td>2/21</td>
<td>Soil-Water Potential</td>
<td>6 (155-161)</td>
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<td>17</td>
<td>2/24</td>
<td>Soil Water</td>
<td>1, 6 (464-468)</td>
</tr>
<tr>
<td>&amp;19</td>
<td>2/26 &amp; 28</td>
<td>Water Content/Potential Devices</td>
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<td>20</td>
<td>3/3</td>
<td>Saturated Flow</td>
<td>7</td>
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<td>21</td>
<td>3/5</td>
<td>Test 2</td>
<td>March 5</td>
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<td>22</td>
<td>3/7</td>
<td>NO CLASS*</td>
<td>March 7</td>
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<td>23-25</td>
<td>3/10 to 3/14</td>
<td>Saturated Flow</td>
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<td>26, 27</td>
<td>3/24 &amp; 26</td>
<td>Unsaturated Flow</td>
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<td>3/28</td>
<td>Infiltration and drainage</td>
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<td>3/31 &amp; 4/2</td>
<td>Infiltration</td>
<td>14</td>
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<td>31,32</td>
<td>4/4 &amp; 4/7</td>
<td>Redistribution</td>
<td>16</td>
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<td>33</td>
<td>4/9</td>
<td>Test 3</td>
<td>April 9</td>
</tr>
<tr>
<td>34</td>
<td>4/11</td>
<td>Macropore Flow</td>
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<td>35</td>
<td>4/14</td>
<td>Field Water Balance</td>
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<td>36</td>
<td>4/16</td>
<td>Tillage</td>
<td>13</td>
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<td>37-38</td>
<td>4/18 &amp; 21</td>
<td>Geostatistics</td>
<td>Appendix 1</td>
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<tr>
<td>39-42</td>
<td>4/23 to 4/30</td>
<td>Student Reports</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>5/2</td>
<td>Review</td>
<td></td>
</tr>
</tbody>
</table>

The final exam is currently scheduled for Tuesday May 13 from 7:30 a.m. to 10:00 a.m.
I. **Instructor:**

Dr. Richard Zartman  
Plant and Soil Science Department  
Plant Science Room 263  
Texas Tech University  
Lubbock, TX  79409-2122  
Phone:  806-742-1626  
Fax:  806-742-0775  
Email:  richard.zartman@ttu.edu

Please note that this is the ONLY email address that I use.  
Office Hours:  MWF 8-11 AM or by appointment

II. **Course Description:**

Physical characteristics of soils and porous media and principles identifying  
flow and distribution of water, air and heat in soils.

III. **Course Purpose:**

The purpose of this class is to understand the physical characteristics of  
porous media and the principles underlying flow and distribution of water, air and  
heat in soils. This course provides students with advanced knowledge of the  
physical properties of soils. Students will be able to solve problems related to soil  
physical properties.

IV. **Capstone Status:**

This is not a capstone course.

V. **Text:**

*Environmental Soil Physics* by Daniel Hillel, 1998, Academic  
Press. ISBN 0-12-348525-8. This text book may be purchased  
on campus or online at [www.Amazon.com](http://www.Amazon.com) or other book seller.

General Text References:  
The appropriate chapter will be emailed to you as a pdf.

VI. **Expected Learning Outcomes:**

After completing this course, students will be able to:

A. Determine the bulk and particle density and porosity of soil
B. Determine the gravimetric, volumetric, quantity of water in soils

C. Determine the basis for selection of the appropriate water content/potential measuring devices

D. Name the methods to quantify soil aeration

E. Name and classify components of geostatistics

F. Explain the role of soil physical properties in the environment.

VII. Methods for Assessing the Expected Learning Outcomes:
The expected learning outcomes for the course will be assessed through several of the following methods: Exams, writing assignments, and homework.

Course Learning Outcomes and Assessments

<table>
<thead>
<tr>
<th>Learning outcome</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Determine the bulk and particle density and porosity of soil</td>
<td>Exams, homework</td>
</tr>
<tr>
<td>B. Determine the gravimetric, volumetric, quantity of water in soils</td>
<td>Exams, homework</td>
</tr>
<tr>
<td>C. Determine the basis for selection of the appropriate water content/potential</td>
<td>Exams, homework</td>
</tr>
<tr>
<td>measuring devices</td>
<td></td>
</tr>
<tr>
<td>D. Name the methods to quantify soil aeration</td>
<td>Exams, homework</td>
</tr>
<tr>
<td>E. Name and classify components of geostatistics</td>
<td>Exams, homework</td>
</tr>
<tr>
<td>F. Explain the role of soil physical properties in the environment.</td>
<td>Exams, writing assignments, homework.</td>
</tr>
</tbody>
</table>

VIII. Course Assignments and Grading Procedures:
Soil Physics Term Paper and Oral Report

The Soil Physics term paper is 25% of the class grade. This report will need to be on some topic, of your choosing, which is directly related to the topic of Soil Physics. The topic will need to be chosen and submitted to me by Friday, January 31st. The term paper will be due April 25. The paper can be of any length that you feel appropriate (8-10 pages), it must have an abstract and a literature cited section.
IX. **Grades:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Exams at 15% each</td>
<td>45%</td>
</tr>
<tr>
<td>Homework</td>
<td>5%</td>
</tr>
<tr>
<td>Paper</td>
<td>25%</td>
</tr>
<tr>
<td>Comprehensive final</td>
<td>25%</td>
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</tbody>
</table>

**Tuesday, May 13 from 7:30 a.m. to 10:00 a.m.**

X. **Point Distribution:**

- A = 90-100%
- B = 80-89%
- C = 70-79%
- D = 60-69%
- F = 0-59%

XI. **General Information:**

A. The class notes can be located at [www.blackboard.ttu.edu](http://www.blackboard.ttu.edu) on the Texas Tech University BlackBoard web site. You will be asked for your eRaider name and password. Typical eRaider name is your first initial glued in front of your last name. Your password is eight random lettered/numbered sequence assigned by Texas Tech.

B. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405”.

C. “Students are expected to assist in maintaining a classroom environment which is conducive to learning. In order to assure that all students have an opportunity and gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from using cellular phones or beepers, eating or drinking in class, making offensive remarks, reading newspapers, sleeping or engaging in any
other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a request to leave class”.

D. This course is governed by the Texas Tech University academic integrity policy as elucidated at the following URL: http://www.depts.ttu.edu/studentjudicialprograms/PDF-WordFiles/IntegrityMatters.pdf.

You will be allowed to use calculators for the exams. The use of cell phones to take the exams is NOT permitted. Please note the cheating and plagiarism definitions on the above website.

For distance students, this course requires proctored exams. Proctors must be approved by the Plant and Soil Science Department. A list of college test centers that proctor exams is available at www.ncta-testing.org/cctc (click on find a participant; click on the state in which you need to find a testing location). Additional professionals eligible to proctor exams are academic counselors, librarians, military education officers or other pre-approved full-time education professionals. All proctors have a responsibility to facilitate fairness and maintain the academic integrity of the testing process. Therefore, the proctor may not have a personal relationship with the student. Any proctoring fees are the responsibility of the student and these fees will vary. The average range, however, is $20-$40 per exam.

Distance Students please let me know how you would like the exams to be handled. Typically, I email the exams to the student’s proctor. Have the proctor supervise the taking the exam. Have the proctor return the exam to me. This may be done by email, snail-mail, or FAX. The final is comprehensive. With the time lag for mail, I sometimes assign a grade of “X” until the final is received and graded and the final grade assigned. I’ll email you the homework assignments. You can return them by email or snail-mail.

We can keep “in touch” by email. Use only the email address at the top of this document. I do NOT use the email embedded within BlackBoard. If we need to visit by phone, let me know a convenient time so that Texas Tech picks up the phone bill.

If you have questions, please let me know at the email or phone number at the top of this document.
### XII. Tentative Lecture Schedule

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
<th>Chapter/Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/15</td>
<td>Introduction</td>
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<tr>
<td>2</td>
<td>1/17</td>
<td>History</td>
<td>Baver 3rd Ed Ch. 1</td>
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<tr>
<td>3</td>
<td>1/22</td>
<td>Bulk Soil</td>
<td>Hillel 1, 5</td>
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<tr>
<td>4</td>
<td>1/24</td>
<td>Soil Texture</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>1/27</td>
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<td>Jan-14</td>
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<tr>
<td>6</td>
<td>29-Jan</td>
<td>Surface Properties</td>
<td>4</td>
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<tr>
<td>7</td>
<td>1/31</td>
<td>Thermal Regime, I</td>
<td>12</td>
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<tr>
<td>8</td>
<td>2/3</td>
<td>NO CLASS*</td>
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<td>9</td>
<td>2/5</td>
<td>Test 1</td>
<td>Feb 5</td>
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<tr>
<td>10</td>
<td>2/7</td>
<td>Thermal Regime, II</td>
<td>12</td>
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<td>2/10</td>
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<td>6 (155-161)</td>
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<td>17</td>
<td>2/24</td>
<td>Soil Water</td>
<td>1, 6 (464-468)</td>
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<tr>
<td>18</td>
<td>2/26 &amp; 28</td>
<td>Water Content/Potential Devices</td>
<td>6</td>
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<td>20</td>
<td>3/3</td>
<td>Saturated Flow</td>
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<td>21</td>
<td>3/5</td>
<td>Test 2</td>
<td>March 5</td>
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<td>22</td>
<td>3/7</td>
<td>NO CLASS*</td>
<td>March 7</td>
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<td>23-25</td>
<td>3/10 to 3/14</td>
<td>Saturated Flow</td>
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<td>28</td>
<td>3/28</td>
<td>Infiltration and drainage</td>
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<td>29,30</td>
<td>3/31 &amp; 4/2</td>
<td>Infiltration</td>
<td>14</td>
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<tr>
<td>31,32</td>
<td>4/4 &amp; 4/7</td>
<td>Redistribution</td>
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<td>33</td>
<td>4/9</td>
<td>Test 3</td>
<td>April 9</td>
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<td>34</td>
<td>4/11</td>
<td>Macropore Flow</td>
<td>9</td>
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<td>35</td>
<td>4/14</td>
<td>Field Water Balance</td>
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<td>36</td>
<td>4/16</td>
<td>Tillage</td>
<td>13</td>
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<tr>
<td>37-38</td>
<td>4/18 &amp; 21</td>
<td>Geostatistics</td>
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<td>4/23 to 4/30</td>
<td>Student Reports</td>
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<tr>
<td>43</td>
<td>5/2</td>
<td>Review</td>
<td></td>
</tr>
</tbody>
</table>

The final exam is currently scheduled for Tuesday May 13 from 7:30 a.m. to 10:00 a.m.
Instructor: Dr. David C. Weindorf  
Dept. of Plant and Soil Science – Office 214B  
Phone: 806-742-2838 x 231  
Fax: 806-742-0775  
E-mail: David.Weindorf@TTU.edu  
Yahoo Messenger: L3SMUS  
SKYPE: David.C.Weindorf  
Office Hours: Open door policy

Class Location: Lecture: TR 8:00-9:20AM PSS 108  
Laboratory: TBA

I. Course Description:  
Soil profile morphology. Classification systems with emphasis on the taxonomic system of the United States.

II. Course Purpose:  
The overarching purpose of this course is to provide students with an understanding of concepts germane to US Soil Taxonomy. Concepts applied in Soil Taxonomy will also be extended to other international systems of classification where applicable.

III. Reference Texts and Resources:  


Soil Survey Staff. 2013. Simplified guide to keys to soil taxonomy. (E-mail delivery)

IV. **Expected Learning Outcomes:**

Upon completion of this course, you will be able to:

A. Gain appreciation for historical figures in soil science, both domestically and abroad.
B. Understand the evolution of the current system of soil taxonomy used in the United States.
C. Be able to define each of the soil epipedons, diagnostic horizons, master horizons, and subordinates.
D. Gain an understanding of the central concept, global and domestic extent and uses of each of the soil orders.
E. Understand developmental soil processes and factors of soil formation as they relate to the catena and toposequence concepts.
F. Be able to successfully “key out” a given soil profile using Soil Taxonomy.
G. Understand the influence of temperature and moisture regimes on soil development.
H. Understand the influence of mineralogy and particle size classes as they relate to taxonomic classification.
I. Gain an introductory understanding of other major systems of soil taxonomy used worldwide and concepts contained therein which reflect US Soil Taxonomy.

V. **Methods for Assessing the Expected Learning Outcomes:**

The expected learning outcomes for the course will be assessed through exams, quizzes, fieldwork, and a final exam. Graduate students taking Advanced Soil Classification will also be required to remit a term paper.

VI. **Course Assignments and Grading Procedures:**

A. **Hourly Exams:** There will be three hourly exams (roughly one per month) worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, true/false, short answer, and essay. Exam dates are subject to change based on class needs and content delivery. A final exam will be given in early May and will be comprehensive. All exams will be closed notes, closed web, closed book, and are to be completed without interacting with anyone else.

B. **Laboratory:** The lab section of this course will consist of fieldwork. Specifically, working in groups of 2-3 persons, students will describe
and taxonomically classify five soil profiles at the Erskine Rangeland. The class will go to the field once together to walk through the steps of soil description and classification, but after that, students can make arrangements to go complete the descriptions on their own. A neatly typed, report inclusive of all five descriptions will be due by April 30. For each site, you should provide a morphological description, taxonomic classification (to the great group level), brief site description (one paragraph), and two photos (one of the site and one of the soil profile).

C. Quizzes: Attendance will be monitored through unannounced quizzes given periodically throughout the semester. Be sure you come to class prepared at all times. In some instances, homework assignments will be given and counted as a quiz grade.

D. Term Paper (Graduate Students Only): Graduate students are required to complete a term paper by April 15. The report should be no longer than 5 pages typed at 1.5 lines spacing with Arial font. References are required in SSSA format and do not count toward the 5 page limit of the narrative. The topic of the paper will be to select one of the following international systems of taxonomy (World Reference Base, Australian system, Chinese Soil Taxonomy, Romanian system of soil taxonomy) and compare the concepts therein with US Soil Taxonomy. What differences and similarities are found? References to both taxonomy systems as well as a minimum of 10 peer reviewed research papers supporting your arguments are required.

VII. Grades:

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Hourly Exams</td>
<td>3@ 100 pts.</td>
</tr>
<tr>
<td>Laboratory</td>
<td>100</td>
</tr>
<tr>
<td>Quiz Average</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>600</strong></td>
</tr>
</tbody>
</table>

VIII. Point Distribution:

- **A** = 100-89.5%
- **B** = 89.4-79.5%
- **C** = 79.4-69.5%
- **D** = 69.4-59.5%
- **F** = ≤59.4%

IX. General Information:
A. All late work will have 25% deducted for each day or part of a day it is late.

B. If you miss an exam for any reason, you must contact the instructor and make appropriate arrangements within 3 days or a score of "0" will be recorded.

E. There will be no extra credit offered in this course. Please do not request any.

D. ADA Compliance Statement

“Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services Office in 335 West Hall or 806-742-2405.”

E. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams or assignments, will not be tolerated. The guidelines set forth by the University will be followed with any infraction.

F. “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class."

**Tentative Lecture Schedule**

**Lecture Topic**
- History of Soil Survey
- Soil morphology and composition
- Soil composition and characterization
- Weathering and soil formation
- Time in relation to soil formation
- Modern soil classification systems
US Taxonomy
Alfisols
Andisols
Aridisols
Entisols
Gelisols
Histosols
Inceptisols
Mollisols
Oxisols
Spodosols
Ultisols
Vertisols
Soil survey interpretation

Final Exam: per university schedule
PSS 5415 Advanced Greenhouse Crop Production Online

Instructor: Dr. Cynthia McKenney
Office: PSS Room 105
Office Hours: By appointment
Phone: (806) 834-0722
E-mail: Cynthia.McKenney@ttu.edu

Recommended Text:
Greenhouse Operation and Management, 7th Ed., Prentice Hall. This is not required but recommended.

Course Description:
Greenhouse Crop Production is designed to introduce you to the concepts of greenhouse construction, operation and management for a variety of horticultural crops, but with an emphasis on ornamental crops. Course content includes greenhouse construction, heating, cooling, growing media, pest management, nutrition, fertility, growth regulation, irrigation, post-harvest handling, and marketing of greenhouse crops. The competent greenhouse grower should understand how greenhouse construction affects the greenhouse environment, have clear understanding of the necessary inputs and costs necessary for greenhouse growing, as well as plan, manage and market a crop. This graduate level course involves lecture exams and assignments, literature reviews, field trips and lab work.

Course Purpose:
This graduate horticulture class is designed to require you to use the knowledge gained in several lower division classes to provide the basis for the analysis and synthesis of new information leading to plausible solutions to management problems. The exercises incorporated in this course and the individual feedback provided on these exercises is also designed to improve the students’ verbal and written communication skills within the discipline. The overarching purpose of this course is to introduce the students to current greenhouse industry theories and practices and to facilitate the application of this knowledge to complete a cropping schedule.
Expected Learning Outcomes:

Upon completion of this course, the students will be able to:

- Define greenhouse crop production and floriculture.
- Select materials to construct a working greenhouse suitable for an identified region.
- Schedule greenhouse crops from start to finish maximizing space, profit and time.
- Identify standard greenhouse practices in the areas of safety, sanitation and maintenance.
- Calculate materials and application rates for fertility, pesticide, growth regulators, irrigation, space, materials.
- Recommend cultural management practices for specific greenhouse crops.
- Discuss the relevance of peer reviewed journal articles on topics in the greenhouse industry.
- Identify construction and production issues in existing commercial greenhouses.

Methods for Assessing the Expected Learning Outcomes:

The expected learning outcomes for the course will be evaluated on completion of several of the following methods: content application exercises, exams, reading quizzes, class blogs, written assignments, projects and lab activities. See the table below for information on assignments, point values, grading scale and total points for the course. Please note that this schedule is tentative and subject to change.

Course Assignments and Grading Procedures:

- Field Trips: Two independent field trips will be taken during this course. Reports summarizing the trips will be completed following the excursion and the due dates will be outlined on the course website. These reports should have a title page and include an introduction, critique of the business being visited and a conclusion. The reports should be about one page in length per location and submitted through the Blackboard platform. Each report is worth 25 points. Virtual trips are available if necessary on the course platform.

- Hourly Exams:
  There will be four hourly exams worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, short answer and essay. Exam dates are listed on the course schedule located on the course website. Each exam will include the
content generated from the presentations each of you will post for the course. The final or fourth exam will not be comprehensive. It will have the same format at the 3 prior exams.

- **Proctors:**
  This course requires proctored exams. Proctors must be approved by the Department of Plant and Soil Science and must be submitted by the end of the second week of class. After this point, it will be assumed you have withdrawn from the course. Submit your proctor form to diann.merriman@ttu.edu

A list of college test centers that proctor exams is available at www.ncta-testing.org/cctc (click on find a participant; click on the state in which you need to find a testing location). Additional professionals eligible to proctor exams are academic counselors, librarians, military education officers or other pre-approved full-time education professionals. All proctors have a responsibility to facilitate fairness and maintain the academic integrity of the testing process. Therefore, the proctor may not have a personal relationship with the student. Any proctoring fees are the responsibility of the student and these fees will vary. However, the average range is $20-$40 per exam. There is a departmental form for proctor submission available on the course website under the Proctor Approval link.

- **Content Quizzes:**
  There will be 15 content quizzes during the semester that will each be worth 10 points. These quizzes are intended to determine the students’ comprehension of presented material and encourage the students to keep up with the course modules. These quizzes must be completed online at the assigned time. You may take each quiz up to 3 times and the highest score will be recorded. See the course schedule for specific dates.

- **Calculation Assignment:**
  During this course you will complete 4 assignment in which will involve calculations common to the greenhouse industry. All calculations will be completed via the Blackboard platform and will be automatically graded. This assignment is worth 20 points.

- **Lecture Presentation:**
  You will be assigned a topic in which you will create a PowerPoint presentation of a course topic. The presentation should be about 45 minutes in length and cover the topic at a
graduate course level. You will then post the presentation on the course website and complete the creation of the entire module including outcomes, review questions and outline. The material covered will become part of the course content and you will be tested on it as a 5th exam prior to the end of the course. All modules will be due at the time of the third exam. No exceptions.

• **Crop Scheduling Project:**
  To complete the crop scheduling project will need to select 4 crops for approval by your instructor. Any crop which can be grown in a greenhouse is acceptable. Once your crops are approved, you will need to write an informative 1 page research report on each crop which will include information about:
  - Scientific and common names
  - Common or favorite cultivars
  - Description of the plant
  - Culture: USDA zones, light tolerance, warm v. cool season etc.
  - Greenhouse Culture: propagation method, finished sizes, irrigation, fertility, pest issues, growth regulators, pinching, pruning, timing etc.
  - Market: Who buys this crop? Who do they sell it to? What is the retail price? What stage is salable? Shippable? Are there shipping constraints (time, temperature, out of state quarantine etc).

  You will need to cite at least 4 resources for the 4 crops. Use ASHS format for in text citation and for works cited. Use 12 point, Times New Roman and double line spacing. Include a coversheet with your name, section, date, instructor and title.

• **Blogs:**
  You will participate in 4 blogs over articles on current trends and issues in the greenhouse industry. You will need to select each article from industry journals and post a PDF of the article along with your comments on blog assignment site. You will provide an initial post equivalent to a minimum of a ½ page of standard text. Return back to the blog site and then provide reflective responses to two other posts from other members of the class. These reflective responses must be a minimum of 5 lines each. Each blog will be worth 25 points.
Point Distribution for Course Activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Quantity</th>
<th>Points Each</th>
<th>Total Points</th>
<th>Approx % Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Exams</td>
<td>3</td>
<td>100</td>
<td>300</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>1</td>
<td>100</td>
<td>100</td>
<td>8%</td>
</tr>
<tr>
<td>Blogs</td>
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<td>50</td>
<td>200</td>
<td>17%</td>
</tr>
<tr>
<td>Cropping Schedule Paper</td>
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<td>8%</td>
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<tr>
<td>Calculation Worksheets</td>
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<td>25</td>
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<td>8%</td>
</tr>
<tr>
<td>Lecture Preparation</td>
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<td>8%</td>
</tr>
<tr>
<td>Field Trip Reports</td>
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</tr>
<tr>
<td>Reading Quizzes</td>
<td>15</td>
<td>10</td>
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</tr>
<tr>
<td>Lab Cropping Journal</td>
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<td>50</td>
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Grade Distribution by Points

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</tr>
<tr>
<td>F</td>
<td>719-0</td>
<td>0-59%</td>
</tr>
</tbody>
</table>

General Information:

- Missed exams will be recorded as "0" unless you contact me before the next class period concerning your absence. However, you must have a reasonable excuse (documented illness, death in the family, etc.) before a make-up exam will be considered. If you are an on campus student, you will need to contact the academic testing center to make an appointment for a makeup exam. The student is responsible for any fees incurred.
• Late materials will not be accepted.

• There will be NO extra credit offered in this course. Please do not ask.

• “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from “AccessTECH” located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: http://www.accesstech.dsa.ttu.edu/default.asp

• Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction.

• Integrity and professionalism are expected at this level of education. Unauthorized collaboration on assignments or projects, as well as dishonesty on exams and quizzes will not be tolerated. Suspected cases of cheating or plagiarism and grade disputes and appeals will be handled according to the academic regulations of the University.

• Texas Tech University, Operating Policy and procedures 34.12, Grading Procedures: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempts of students to present as their own any work not honestly performed (as outlined below) is regarded by the faculty and administration as a most serious offense and renders offenders liable to serious consequences, possibly suspension for the Texas Tech University. Dishonesty of any kind on examinations, quizzes, or written assignments, illegal possession of examinations, use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry of unauthorized presence in an office, are all instances of cheating. The instructor in a course is responsible for initiating action in each case of
dishonesty or plagiarism that occurs in that class. In cases of convincing evidence or of admitted academic dishonesty or plagiarism, an instructor should take appropriate action as described below. Before taking such action, however, the instructor should attempt to discuss the matter with the student. In cases in which guilt is admitted by the student or determined by the instructor, after attempting to contact the student, the offending student may be given a failing grade in a course as a result of academic dishonesty or plagiarism, the instructor should report in writing to the instructor’s department chairperson the facts of the case and the action to be taken against the student. The chairperson will provide a copy of the letter to the student, the student’s dean, the Student Mediation Center, and the chairperson’s dean. The Student Mediation Center shall retain a copy of this report in its discipline files. The student will have the right to appeal the receipt of a failing grade in a course through the established grade appeal procedure. The student may not appeal a failing grade given for class assignments.

- “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.”

- Online learners are expected to maintain professionalism in communication at all times. Discussion forums and email messages should be courteous, grammatically correct and well proofed. Profanity, slang and flaming will not be tolerated.
PSS 4411 Greenhouse Crop Production

Instructor: Dr. Cynthia McKenney Phone: (806) 834-0722
Office: PSS Room 105 E-mail: Cynthia.McKenney@ttu.edu
Office Hours: Immediately before or after class

**Recommended Text:**
Greenhouse Operation and Management, 7th Ed., Prentice Hall. This is not required but recommended.

**Course Description:**
Greenhouse Crop Production is designed to introduce you to the concepts of greenhouse construction, operation and management for a variety of horticultural crops, but with an emphasis on ornamental crops. Course content includes greenhouse construction, heating, cooling, growing media, pest management, nutrition, fertility, growth regulation, irrigation, post-harvest handling, and marketing of greenhouse crops. The competent greenhouse grower should understand how greenhouse construction affects the greenhouse environment, have clear understanding of the necessary inputs and costs necessary for greenhouse growing, as well as plan, manage and market a crop. This senior level course involves lecture exams and assignments, literature reviews, field trips and lab work.

**Course Purpose:**
This upper division horticulture class is one of the two courses designed to fulfill the capstone course requirement for the Horticulture program at Texas Tech University. Thus, knowledge gained in several lower division classes provides the basis for the analysis and synthesis of new information to provide plausible solutions to management problems. In addition, this course serves as a writing intensive course for the discipline. The exercises incorporated in this course and the individual feedback provided on these exercises is designed to improve the students’ verbal and written communication skills within the discipline. The overarching purpose of this course is to introduce the students to current greenhouse industry theories and practices and to facilitate the application of this knowledge to complete a cropping schedule.
Capstone Status:
This course has been designated a capstone experience. The capstone components included are:

- Written evaluations of existing greenhouse operations to improve their written communication skills in the discipline.
- Analysis of current greenhouse industry issues to develop decision-making skills.
- Greenhouse cropping project to enhance critical thinking skills.

Expected Learning Outcomes:
Upon completion of this course, the students will be able to:

- Define greenhouse crop production and floriculture.
- Select materials to construct a working greenhouse suitable for an identified region.
- Schedule greenhouse crops from start to finish maximizing space, profit and time.
- Identify standard greenhouse practices in the areas of safety, sanitation and maintenance.
- Calculate materials and application rates for fertility, pesticide, growth regulators, irrigation, space, materials.
- Recommend cultural management practices for specific greenhouse crops.
- Discuss the relevance of peer reviewed journal articles on topics in the greenhouse industry.
- Identify construction and production issues in existing commercial greenhouses.

Methods for Assessing the Expected Learning Outcomes:
The expected learning outcomes for the course will be evaluated on completion of several of the following methods: content application exercises, exams, reading quizzes, class blogs, written assignments, projects and lab activities. See the table below for information on assignments, point values, grading scale and total points for the course. Please note that this schedule is tentative and subject to change.

Course Assignments and Grading Procedures:
- **Field Trips:** Two independent field trips will be taken during this course. Reports summarizing the trips will be completed following the excursion and the due dates will be outlined on the course website. These reports should have a title page and include an introduction, critique of the business being visited and a conclusion. The reports should be
about one page in length per location and submitted through the Blackboard platform. Each report is worth 25 points.

- **Hourly Exams:**
  There will be four hourly exams worth 100 points each. Each exam will include a variety of question types such as multiple choice, matching, short answer and essay. Exam dates are listed on the course schedule located on the course website. The final exam will not be comprehensive. It will have the same format at the 3 prior exams.

- **Content Quizzes:**
  There will be 15 content quizzes during the semester that will each be worth 10 points. These quizzes are intended to determine the students’ comprehension of presented material and encourage the students to keep up with the course modules. These quizzes must be completed online at the assigned time. You may take each quiz up to 3 times and the highest score will be recorded. See the course schedule for specific dates.

- **Calculation Assignment:**
  During this course you will complete 4 assignment in which will involve calculations common to the greenhouse industry. All calculations will be completed via the Blackboard platform and will be automatically graded. This assignment is worth 20 points.

- **Crop Scheduling Project:**
  To complete the crop scheduling project will need to select 4 crops for approval by your instructor. Any crop which can be grown in a greenhouse is acceptable. Once your crops are approved, you will need to write an informative 1 page research report on each crop which will include information about:
  - Scientific and common names
  - Common or favorite cultivars
  - Description of the plant
  - Culture: USDA zones, light tolerance, warm v. cool season etc.
  - Greenhouse Culture: propagation method, finished sizes, irrigation, fertility, pest issues, growth regulators, pinching, pruning, timing etc.
• Market: Who buys this crop? Who do they sell it to? What is the retail price? What stage is salable? Shippable? Are there shipping constraints (time, temperature, out of state quarantine etc).
You will need to cite at least 4 resources for the 4 crops. Use ASHS format for in text citation and for works cited. Use 12 point, Times New Roman and double line spacing. Include a coversheet with your name, section, date, instructor and title.

• Blogs:
You will participate in 4 blogs over articles on current trends and issues in the greenhouse industry. You will need to select each article from industry journals and post a PDF of the article along with your comments on blog assignment site. You will provide an initial post equivalent to a minimum of a ½ page of standard text. Return back to the blog site and then provide reflective responses to two other posts from other members of the class. These reflective responses must be a minimum of 5 lines each. Each blog will be worth 25 points.

Point Distribution for Course Activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Quantity</th>
<th>Points Each</th>
<th>Total Points</th>
<th>% Total Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Exams</td>
<td>3</td>
<td>100</td>
<td>300</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>1</td>
<td>100</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Discussions</td>
<td>4</td>
<td>25</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Cropping Schedule Paper</td>
<td>1</td>
<td>100</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Calculation Worksheets</td>
<td>4</td>
<td>25</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Field Trip Reports</td>
<td>2</td>
<td>50</td>
<td>100</td>
<td>10%</td>
</tr>
<tr>
<td>Reading Quizzes</td>
<td>15</td>
<td>10</td>
<td>150</td>
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</tr>
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<td>Lab Cropping Journal</td>
<td>1</td>
<td>50</td>
<td>50</td>
<td>5%</td>
</tr>
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<td><strong>Total</strong></td>
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<td></td>
<td>1000</td>
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<tr>
<td>Letter Grade</td>
<td>Points</td>
<td>Percentage</td>
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<tr>
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<td></td>
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<tr>
<td>A</td>
<td>1000-900</td>
<td>90-100%</td>
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<td>B</td>
<td>899-800</td>
<td>80-89%</td>
<td></td>
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</tr>
<tr>
<td>C</td>
<td>799-700</td>
<td>70-79%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>699-600</td>
<td>60-69%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>599-0</td>
<td>0-59%</td>
<td></td>
<td></td>
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</table>

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Texas Tech University  
Department of Plant and Soil Sciences  
Wine Quality Control and Analysis- PSS 4416  
Spring 2015

Instructor: Maureen Qualia  
Office: Hill Country University Center  
2818 E Highway 290  
Fredericksburg, TX 78624  
Office Hours: By appointment in person, via phone, Lync or Skype.  
Phone: 806.834.4780  
Email: maureen.qualia@ttu.edu  
Emails will be returned within 24hrs Mon-Fri and 48hrs Sat and Sun.

Lecture:  
Meeting Times: Tuesday and Thursday 14:00-15:20 (15wks).  
Class Location: Lecture discussion is on-line synchronous via Microsoft Lync.  
Must attend live sessions!

Lab:  
Meeting times and location: TBA (Will be decided by class availability)

Contact Information for Technical Support: IT Help Central 806.742.HELP  
Credit: 4 credit hours  
Prerequisites: Successful completion of the following courses or permission of instructor.  
• CHEM 1307 & 1308 Principles of Chemistry I & II  
• CHEM 1107 & 1108 Principles of Chemistry I & II Labs,  
• PSS 1311 Winemaking Worldwide  
• PSS 2314 Wine Production Introduction  
• FDSC 3301 Food Microbiology or MBIO 3400 Microbiology (may be taken concurrently).

Course Requirements: Microsoft Lync, Microsoft Office, Blackboard, Adobe Acrobat Reader  
Required Materials: Lab coat or apron, protective eyewear.

Required Text:  
Available through TTU online library.  

Suggested Texts/Readings  
Chapman and Hall, New York.  

*Additional reading material will be provided throughout the duration of the course.*
Course Description
This course will provide an overview of wine production focusing on post-fermentation processes including:
quality control and analysis (spoilage prevention, recognition, and rectification), implementation of stylistic
tools and strategies, aging and maturation options, stabilization, fining, blending, filtration and bottling.

Expected Learning Outcomes
Upon successful completion of this course students should be able to:
1. Demonstrate an understanding of the overall process of grape wine production.
2. Demonstrate an understanding of importance of quality control throughout wine production, maturation,
and bottle aging.
3. Demonstrate comprehension of wine chemistry and techniques of traditional chemical analysis.
4. Identify limiting factors, sources of error, and troubleshooting of traditional laboratory techniques and
analyses.
5. Identify methods used to clarify, stabilize, fine, and blend for quality improvement.
6. Evaluate and understand wine stability and remedial actions required.
7. Identify if a wine may be improved by fining and set up appropriate laboratory bench trials.
8. Determine maturation techniques for a given wine style.
9. Access and analyze current industry research and literature.
10. Identify resources available to assist in problem solving during wine production.

Course Structure and Requirements
This course will be administered via distance and will consist of both asynchronous and live synchronous sessions. This
course will be taught in a “Flipped Classroom” format. Lectures will be pre-recorded and uploaded on Blackboard to be
viewed prior to the live class. Pre-recorded lectures will be limited to no more than 3 hours per week and must be viewed
prior to the live class time. Lectures will only be available online during the week in which they are scheduled. Once a
lecture has been removed from Blackboard students will no longer have access to it (A PDF file of the slides only will
remain available on BB for the duration of the course). The live synchronous sessions will be used for discussion,
application, and problem based learning. **Live Sessions must be attended!**

Exam and Proctor details
Exam dates are listed on the Course Calendar and tentative course outline below. All exams will be given online via
BlackBoard. To ensure student integrity, each Exam will be proctored. Students on campus, or within driving distance of
Texas Tech University may take Exams with Academic Testing Services (ATS, 806.742.3671). If you plan to use ATS,
you need to let the instructor know you are following this option. Those not within driving distance of Texas Tech must
submit their potential proctor’s name, title, business, physical address, phone number, and e-mail address to the instructor
and Diann Merriman (diann.merriman@ttu.edu). Proctors may not be friends, family members, or have previously
associated with students in any way (other than being a proctor for a previous course). Proctors must be located at an
institution of higher education (testing center), Sylvan type Learning Center, high school library, public library, etc. After
you submit information, the instructor will send each potential proctor an email requesting their willingness to participate.
Some proctor for free, while others may charge for each Exam given. Please submit your information to me by 5:00 pm,
January 31, 2014. There will be no exceptions to these requirements. If you do not submit proctor information by the
above date and time, you will not be allowed to take Exams. In addition, if you do not make previous arrangements with
the course professor and you miss an Exam you will not be able to make up the missed Exam.
Assessment of Learning Outcomes

**Participation:** Participation includes attendance of and contribution to discussion during live sessions via Lync.

**Research reports:** One research report will be required. Further instruction will follow with assignment.

**Lab Reports:** Three laboratory reports will be required. Format will be provided on Blackboard at time of laboratory.

**Exams:** There will be a total of 2 midterm exams and 1 final comprehensive exam. All exams will be administered through blackboard.

### Grading

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<th>Description</th>
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<td>200</td>
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<tbody>
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<td>80-89</td>
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<tr>
<td>70-79</td>
<td>C</td>
</tr>
<tr>
<td>60-69</td>
<td>D</td>
</tr>
</tbody>
</table>

*Each week of instruction is worth approximately 10 participation points.

**No late assignments will be accepted. Missed exams will receive 0pts! No Make Up exams!**

**Monitoring Progress**

Students can check their progress in the class using the “My Grades” tool from the course Blackboard Page.

**Blackboard**

All lectures will be prerecorded and posted to Blackboard. Lectures should be viewed prior to the scheduled live class. Lectures will only be available online during the week in which they are scheduled. Once a lecture has been removed from Blackboard students will no longer have access to it (A PDF file of the slides only will remain available on BB for the duration of the course).

**Submitting Assignments**

All assignments must be submitted online via blackboard.

**Considerations for Live Online Classes**

While attending the live online sessions, please be aware of the appropriateness of your surroundings and attire.
Subject to Change
This syllabus and schedule are subject to change. Please check email and BB regularly for updates.

Academic dishonesty
Please review the Texas Tech University Operating Policy and Procedure (OP 34.12) which provides some extensive definitions of “scholastic dishonesty". The instructor is responsible for initiating action in each case of dishonesty.

ADA Statement
“Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.” (OP 34.22)

Observance of religious holidays
"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily. (OP 34.22)

Civility in the Classroom
Students are expected to assist in maintaining a classroom environment that is conducive to learning. To ensure that all students have the opportunity to gain from time spent in class.
<table>
<thead>
<tr>
<th>Week/Module</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Lab Topic</th>
<th>Assignments</th>
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<tr>
<td>1</td>
<td>15-Jan</td>
<td>Intro</td>
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<tr>
<td>2</td>
<td>20-Jan</td>
<td>HACCP Approach to Winemaking</td>
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<tr>
<td>3</td>
<td>27-Jan</td>
<td>Wine microbes and spoilage</td>
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<td>29-Jan</td>
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<td>4</td>
<td>3-Feb</td>
<td>Cellar Sanitation and Wine Movements</td>
<td>Brix: Hydrometry, refractometry</td>
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<td>5-Feb</td>
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<td>5</td>
<td>10-Feb</td>
<td>Wine maturation: Oxygen and SO2</td>
<td>pH, TA</td>
<td>Report 1 Due</td>
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<td>12-Feb</td>
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<td>6</td>
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<td>Wine maturation: oak, phenolics, sur lie aging</td>
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<td>8</td>
<td>24-Feb</td>
<td>Exam 1</td>
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<td>26-Feb</td>
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<td>VA: Cash still</td>
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<td>9</td>
<td>3-Mar</td>
<td>Sulfides</td>
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<td>5-Mar</td>
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<td>10</td>
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<td>Cold and Heat Stability</td>
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<td>Spring Break</td>
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<td>26-Mar</td>
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<td>12</td>
<td>31-Mar</td>
<td>Blending</td>
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<td></td>
<td>2-Apr</td>
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<td>RS and ML</td>
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<td>13</td>
<td>7-Apr</td>
<td>Exam 2</td>
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<td>9-Apr</td>
<td></td>
<td>YAN and Ammonia</td>
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<tr>
<td>14</td>
<td>14-Jul</td>
<td>Filtration</td>
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<td></td>
<td>16-Apr</td>
<td></td>
<td>Filterability/ Turbidity</td>
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<tr>
<td>15</td>
<td>21-Apr</td>
<td>Packaging and closures</td>
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<td></td>
<td>23-Apr</td>
<td></td>
<td>Dissolved oxygen, CO2</td>
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<tr>
<td>16</td>
<td>28-Apr</td>
<td>Bottling and bottle storage</td>
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<tr>
<td>Date</td>
<td>Event</td>
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<td>30-Apr</td>
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<tr>
<td>TBA</td>
<td>Final</td>
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</tbody>
</table>
INSTRUCTOR: Robert J. Wright, Ph.D.
Human Science, Room 281K
Phone: 742-4764
robert.wright@ttu.edu

OFFICE HOURS: Human Science, Room 281K
Thursday: 2:00-3:00 PM
Other times may be arranged by appointment

MEETING PLACE AND TIME: Tuesday and Thursday: 12:30-1:50 pm, PSS 108
Tuesday: 2:00-4:00 pm, Greenhouse 105

COURSE PREREQUISITE: PSS3421 Fundamental Principles of Genetics or an equivalent course in genetics

RECOMMENDED TEXTBOOK: Selected Readings

COURSE DESCRIPTION:
This introductory course in plant biotechnology is designed for undergraduate seniors and first year graduate students. The emphasis is on contemporary methods of plant biotechnology and the genetic principles on which these methods are based. Specific importance will be given to plant industry related topics such as marketability, product development, regulatory compliance, and IP protection. The students develop an understanding and appreciation of relevant scientific disciplines which support the development of improved biotech crop varieties and learn the genetic principles on which these functions are based.

COURSE PURPOSE:
This upper division Plant and Soil Science class is designed to fulfill the capstone course requirement for the Agronomy and Plant Biotechnology curriculum at Texas Tech University. The exercises incorporated in this course are designed to improve the students analytical and communication (verbal and written) skills within the discipline. In addition, this course serves as a writing intensive course for the discipline. The general goal is to introduce the students to design problems, concepts and solutions so that they may take these theories and apply their knowledge in modern genetic analysis.

EXPECTED LEARNING OUTCOMES:
Upon completion of this course, the students will be able to:

- Recognize and explain the relevant genetic, quality, and regulatory principles applicable to a contemporary crop improvement program.
• Discuss and give examples of the tools and methods employed in the development of improved agronomic and horticultural crop varieties.

• Distinguish and relate the “science of plant biotechnology” in general for future professional development.

METHODS OF MEASURING EXPECTED LEARNING OUTCOMES:

SPECIAL ASSIGNMENTS: Five special assignments will simulate common problems and responsibilities encountered during the development of biotech crops. Groups of two students will work together on each assignment and report their findings in a written report (limited to 4 pages + cover letter).

BOOK REPORT (PSS5421): Graduate students are required to read “Lords of the Harvest: Biotech, Big Money, and the Future of Food” by Daniel Charles and submit a report (limited to 10 pages) summarizing the book (Due December 5th).

FIELD TRIPS: During the dates in which the class will tour other research facilities the van will leave from the parking lot at the east-end of the Plant Science Building. Each student is required to demonstrate the utmost courtesy to each host.

EXAMS: There will be three exams that will cover lecture material and any class assignment (readings, handouts, etc.). Exams will emphasize short answer, essay, and problem solving questions. The Final will be 2/3 comprehensive and 1/3 from new material.

EXAM POLICY:

I expect you to take exams at the scheduled time. If there is any reason why you can not take an exam during the scheduled time, you should discuss the reason with me before the exam.

SCHEDULE:

Exam 1 Thursday February 24th 6:00 – 9:00 pm PSS 108
Exam 2 Thursday March 31st 6:00 – 9:00 pm PSS 108
Final Exam Thursday May 5th 4:30-7:00 pm PSS 108

GRADING:
The following activities will contribute to your grade.

PSS4415

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Special Assignments (5 @ 60 pts)</td>
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<tr>
<td>Exams (2 @ 200 pts)</td>
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<td>Final Exam (2/3 comprehensive, 1/3 new subject matter)</td>
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PSS5421

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<tr>
<td>Exams (2 @ 200 pts)</td>
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</tr>
<tr>
<td>Final Exam (2/3 comprehensive, 1/3 new subject matter)</td>
<td>200</td>
</tr>
</tbody>
</table>

PSS4415/PSS5421 – pg. 2
CLASS ATTENDANCE:
Students are expected to have read assigned readings prior to the day’s class, attend each class lectures, complete and return homework assignments by each deadline, and actively participate in each class session. More than two unexcused absences will result in a 5% reduction in your overall grade. Each sequential absence past 3 will result in an additional 5% reduction in overall grade. Students are expected to notify Dr. Wright regarding excusable absences according to the university’s “Academic Regulations” policy.

ACADEMIC REGULATIONS:
Please refer to the 2009-10 Texas Tech University Undergraduate and Graduate Catalog (p. 48-52) for a complete list of “Academic Regulations”.

Reporting Illness: In case of illness that will require absence from class for more than one week, the student should notify his or her academic dean. The dean’s office will inform the student’s instructors through the departmental office. In case of class absences because of a brief illness, the student should inform the instructor directly. Other information related to illness is found in the Student Handbook and the Residence Halls Handbook.

Absence Due to Religious Observance: a student who is absent from class for the observance of a religious holy day, according to the legal definition, will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence if, not later than the 15th day after the first day of the semester, the student has notified the instructor of each scheduled class that the student will be absent for a religious holy day.

This notification will be in writing and will be delivered by the student personally, with the receipt of the notification acknowledged and dated by the instructor, or by certified mail, return receipt requested, addressed to the instructor.

A student who is excused under this policy must not be penalized for the absence, but the instructor may appropriately respond if the student fails to satisfactorily complete the assignment.

Absence due to officially approved trips: Department chairpersons, directors, coaches, or person responsible for a student representing the university on officially approved trips should notify the student’s instructors of the departure and return schedule in advance. The instructor so notified must not penalize the student, although the student is responsible for material missed.

Academic Integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.
“Scholastic dishonesty” includes, but not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student or the attempt to commit such an act.

**Cheating:** Dishonesty on examinations, quizzes, or homework assignments; illegal possession of examinations, the use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry to or unauthorized presence in an office are instances of cheating.

**Plagiarism:** Offering the work of another as one’s own, without proper acknowledgement, is plagiarism; therefore any student who fails to give credit for quotations or an essentially identical expression of material taken from books, encyclopedias, magazines, and other reference works, or from the themes, reports, or other writings of a fellow student, is guilty of plagiarism.

**Classroom Conduct:** Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to ensure that all students have an opportunity to gain from time spent in the class, unless otherwise approved by the instructor; students are prohibited from using cellular phones or beepers or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a request to leave class.

1. Please turn off cellular phones and pagers, do not eat or drink in class, talk to neighbors, or engage in any other forms of distraction.

2. Please treat others with courtesy. People engaged in disruptive or rude behavior may be asked to leave the classroom.

3. Suspected cases of cheating or plagiarism will be handled according to the academic regulations of the University. If it is determined that cheating occurred, the student will be dismissed and fail the class.

4. Quizzes, problem sets, and exams may be made up only with a valid excuse, and prior approval of the instructor. Late problem sets will not be accepted because the answers will be discussed in the discussion section when due.

5. "The department, college, and university endorse PL 101-336, the Americans with Disabilities Act of 1990. Students with disabilities are encouraged to inform the faculty member so that any needed accommodations can be provided. All attempts will be made to maintain confidentiality."

6. It is the policy of the university to accommodate the religious observances of students, based on Texas statutes. If there are religious observances that would interfere with student participation in class events, please let the instructor know as soon as possible, so that alternate arrangements may be made.

**Students with Disabilities:** Any student who because of a disability may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary accommodations. Student should present appropriate verification from Access TECH. No requirement exists that accommodations be made prior to completion of this university procedure.

**Ombuds Office:** The office of Ombudsman is available to assist student with any conflict or problem that has to do with being a student Texas Tech University. You may visit the Ombudsman in 024 Student Union Building or call 742-SAFE.
<table>
<thead>
<tr>
<th>Date</th>
<th>PowerPoint</th>
<th>Lecture Topic</th>
<th>Assignment</th>
<th>Deadline</th>
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<tr>
<td>Jan 13</td>
<td>1.1</td>
<td>Welcome, Course Outline: Mendel’s Experiment and Biotechnology</td>
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<td>Jan 20</td>
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<td>Mendel’s Experiment and Biotechnology</td>
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<td>Feb 1</td>
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<td>Analysis of the Phenotype</td>
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<td>Feb 8</td>
<td>1.3</td>
<td>Analysis of Alleles, Genes, Genotypes</td>
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<td>Analysis of Alleles, Genes, Genotypes</td>
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<td>Feb 15</td>
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<td>Analysis of Native and Designed Populations</td>
<td>SA3</td>
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<td>Pre-GMO/Genomics Plant Breeding</td>
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<td>Recombinant DNA Technology</td>
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<td>Mar 1</td>
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<td>Cloning Genes and Genomes</td>
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<td>Mar 3</td>
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<td>Transformation</td>
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<td>Mar 8</td>
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<td>Transformation</td>
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<td>Gene Efficacy Testing and Molecular Characterization</td>
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<td>Mar 22</td>
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<td>Product Development: Elite Event Selection</td>
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<td>Product Development: Regulatory Compliance, Deregulation, and Intellectual Property (IP) Issues</td>
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<td>Mar 29</td>
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<td>Product Development: Seed Production and Quality Assurance Testing Post-GMO Plant Breeding</td>
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<td>Mar 31</td>
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<td>Enabling Technologies to Study Genomes</td>
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<td><strong>Review</strong></td>
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<td>May 5</td>
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<td><strong>Final Exam (Thursday 4:30 – 7:00)</strong></td>
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PSS 5425 –Advanced Agricultural Plant Pathology
Fall Semester, 2015

INSTRUCTOR:

Dr. Jason E. Woodward

Offices: Campus- Agricultural Science, Room 211

Texas A&M AgriLIFE Research and Extension Center
1102 East FM 1294, Lubbock, TX 79403
(From I-27, take Exit 11, and go east ~½ mile)

Office hours:
  Monday:    by appointment
  Tuesday:   9:30 am - 12:00 pm; 2:00 pm - 5:00 pm
  Wednesday: by appointment
  Thursday:  7:00 am - 8:00 am; 3:30 pm - 5:00 pm
  Friday:    by appointment

Phone: 806-632-0762 (cell)
E-mail: jewoodward@ag.tamu.edu

TEXT:


2. Additional materials from alternate sources will be provided by the instructor when required.

COURSE DESCRIPTION:

Plant pathology is the study of plant diseases. PSS 4425 –Agricultural Plant Pathology will provide students with a comprehensive introduction to the discipline of plant pathology. The course will focus on plant disease symptomology, proper diagnosis, different pathogen groups and lifecycles, as well as cultural and chemical management options. Various pathosystems will be used to educate students on the aforementioned aspects of the course. Specific course objectives will include:

- An overview and understanding of basic concepts and principles of plant pathology, and their influence on disease development and management
- The importance of pathogen populations and environmental conditions on disease severity
- Specific areas to be covered will include disease diagnosis and management in row, vegetable, and greenhouse crops, as well as tree, ornamental, nursery, and turfgrass systems.
COURSE PURPOSE:
This course will provide students with a general understanding of applied plant pathology that will allow them to function in various agricultural careers. The principles learned in this course can be used by farmers, industry personnel, crop consultants, and extension personnel.

EXPECTED LEARNING OUTCOMES:
Upon completion of this course, students will be able to understand basic plant pathology concepts and principles, and apply that knowledge in making disease management decisions.

METHODS FOR ASSESSING THE EXPECTED LEARNING OUTCOMES:
The instructor will issue topic related homework, quizzes, exams, classroom discussions, and written assignments to assess the learning outcomes.

Quizzes will be given unannounced at the beginning of class and will be turned in after approximately 5 min. Students will not be allowed to take any quiz after they have been taken up.

Homework assignments consisting of terms, concepts and/or written reports will be assigned on Thursday and the following week in a week.

Students will be required to choose a topic of interest write a 7 to 10 page term paper complete with citations in a bibliography. Topics must be turned in to the instructor in class on 8-Sept. To facilitate student efforts in completing this assignment, a detailed outline of the paper and a rough draft must be turned in on 29-Sept and Oct-27, respectfully. A final draft of the paper is due to the instructor prior to the Thanksgiving holiday break on 24-Nov.

Students will be required to provide short write-ups (maximum of 1 page) for five unknown diseases introduced during labs and/or disease specimens found on their own out of class.

Two practical exams, including material covered in lab, will be administered on 1-Oct and 19-Nov.

A comprehensive final exam will be administered in the classroom on Sat 6-Dec from 7:30 am to 10:00 am.
GRADING:

There will be a total of 1200 points for the course (lecture and lab combined) with the following breakout:

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<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Points</th>
</tr>
</thead>
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<tr>
<td>Attendance and participation*</td>
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<tr>
<td>Mini-exams</td>
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<td>Quizzes</td>
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<td>Term paper</td>
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<tr>
<td>Lab assignments/reports</td>
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<td>PowerPoint presentation</td>
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<tr>
<td>Comprehensive final</td>
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<td><strong>Total points</strong></td>
<td></td>
<td><strong>1300</strong></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Course grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
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<tr>
<td>B</td>
<td>85-92</td>
</tr>
<tr>
<td>C</td>
<td>75-84</td>
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<tr>
<td>D</td>
<td>65-74</td>
</tr>
<tr>
<td>F</td>
<td>≤65</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Lect.</th>
<th>Chapter #. Title (pages)</th>
<th>Homework (HW)</th>
<th>Lab</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-Aug</td>
<td>T</td>
<td>1</td>
<td>General concepts, definitions and historical events (Supp.**)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. What's wrong with my plant (1-20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27-Aug</td>
<td>R</td>
<td>2</td>
<td>7. What are the causes of plant diseases- Abiotic factors (119-139)</td>
<td>HW #1 assigned</td>
<td>1</td>
<td>General lab procedures</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8. What types of plant diseases are there (141-176)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1-Sep</td>
<td>T</td>
<td>3</td>
<td>6. What are the causes of plant diseases-Parasitic flowering plants</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>5. What are the causes of plant diseases- Viruses (85-106)</td>
<td></td>
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</tr>
<tr>
<td>3-Sep</td>
<td>R</td>
<td>4</td>
<td>5. What are the causes of plant diseases- Viruses (85-106)</td>
<td>HW #1 due</td>
<td>2</td>
<td>Field trip</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overview of insect vectors (Supp.**)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8-Sep</td>
<td>T</td>
<td>5</td>
<td><strong>MINI EXAM #1</strong></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>3. What are the causes of plant diseases- Bacteria (49-66)</td>
<td>Term paper topic due</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Sep</td>
<td>R</td>
<td>6</td>
<td>3. What are the causes of plant diseases- Bacteria (49-66)</td>
<td>HW #2 due</td>
<td>3</td>
<td>Bacteriology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diagnosis and management of bacterial diseases (Supp.**)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15-Sep</td>
<td>T</td>
<td>7</td>
<td>4. What are the causes of plant diseases- Nematodes (67-84)</td>
<td>HW #3 assigned</td>
<td>4</td>
<td>Nematology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nematode sampling and thresholds (Supp.**)</td>
<td></td>
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</tr>
<tr>
<td>17-Sep</td>
<td>R</td>
<td>8</td>
<td>4. What are the causes of plant diseases- Nematodes (67-84)</td>
<td>HW #3 due</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Overview of chemical nematicicides (Supp.**)</td>
<td>HW #4 assigned</td>
<td></td>
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</tr>
<tr>
<td>22-Sep</td>
<td>T</td>
<td>9</td>
<td>2. What are the causes of plant diseases- Fungi (21-48)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Classification of fungal pathogens (Supp.**)</td>
<td></td>
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</tr>
<tr>
<td>24-Sep</td>
<td>R</td>
<td>10</td>
<td><strong>MINI EXAM #2</strong></td>
<td>HW #4 due</td>
<td>5</td>
<td>Introduction to mycology</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Diseases caused by Oomycetes (Supp.**)</td>
<td>HW #5 assigned</td>
<td></td>
<td>Lab report #2 due</td>
</tr>
<tr>
<td>29-Sep</td>
<td>T</td>
<td>11</td>
<td>Diseases caused by Chytrids &amp; Zygomycetes (Supp.**)</td>
<td>Term paper outline due</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Overview of seedling diseases (Supp.**)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1-Oct</td>
<td>R</td>
<td>12</td>
<td>Diseases caused by Basidiomycetes (Supp.**)</td>
<td>HW #5 due</td>
<td>6</td>
<td>LAB EXAM #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Root rot and wood rots (Supp.**)</td>
<td>HW #6 assigned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-Oct</td>
<td>T</td>
<td>13</td>
<td>Diseases caused by Basidiomycetes (Supp.**)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Rust, bunt and smut (Supp.**)</td>
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<tr>
<td>8-Oct</td>
<td>R</td>
<td>14</td>
<td>Diseases caused by Ascomycetes (Supp.**)</td>
<td>HW #6 due</td>
<td>7</td>
<td>Basidiomycete diseases</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ascomycete fruiting structures (Supp.**)</td>
<td>HW #7 assigned</td>
<td></td>
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<tr>
<td>13-Oct</td>
<td>T</td>
<td>15</td>
<td><strong>MINI EXAM #3</strong></td>
<td>HW #7 due</td>
<td>8</td>
<td>Ascomycete diseases</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Diseases caused by Ascomycetes (Supp.**)</td>
<td>HW #8 assigned</td>
<td></td>
<td>Lab report #3 due</td>
</tr>
<tr>
<td>15-Oct</td>
<td>R</td>
<td>16</td>
<td>Asexual forms of fungi (Supp.**)</td>
<td>HW #7 due</td>
<td>8</td>
<td>Ascomycete diseases</td>
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<td></td>
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<td></td>
<td>Overview of fungal diseases (Supp.**)</td>
<td>HW #8 assigned</td>
<td></td>
<td>Lab report #3 due</td>
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<tr>
<td>20-Oct</td>
<td>T</td>
<td>17</td>
<td>Chemical management of fungal diseases (Supp.**)</td>
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<td></td>
<td>Development and implications of fungicide resistance (Supp.**)</td>
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<tr>
<td>22-Oct</td>
<td>R</td>
<td>18</td>
<td>10. How do people influence plant disease epidemics (227-254)</td>
<td>HW #8 due</td>
<td>9</td>
<td>Epidemiology</td>
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<tr>
<td></td>
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<td></td>
<td>Historical perspective of plant disease epidemiology (Supp.**)</td>
<td>HW #9 assigned</td>
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<td>Modeling disease epidemics (Supp.**)</td>
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<tr>
<td>29-Oct</td>
<td>R</td>
<td>20</td>
<td>9. How do plants interact with pathogens (177-225)</td>
<td>HW #9 due</td>
<td>10</td>
<td>Pathogen ecology</td>
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<td></td>
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<td></td>
<td>Ecological interactions (Supp.**)</td>
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<td></td>
<td>Lab report #4 due</td>
</tr>
<tr>
<td>Date</td>
<td>Day</td>
<td>#</td>
<td>Event</td>
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<tr>
<td>3-Nov</td>
<td>T</td>
<td>21</td>
<td><strong>MINI EXAM #4</strong>&lt;br&gt;9. How do plants interact with pathogens – Physiological interactions (177-225)</td>
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<tr>
<td>5-Nov</td>
<td>R</td>
<td>22</td>
<td><strong>HW #10 assigned</strong>&lt;br&gt;9. How do plants interact with pathogens (177-225)&lt;br&gt;Genetic interactions – Part 1 (Supp.**)</td>
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<tr>
<td>10-Nov</td>
<td>T</td>
<td>23</td>
<td>9. How do plants interact with pathogens (177-225)&lt;br&gt;Genetic interactions – Part 2 (Supp.**)</td>
<td></td>
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<tr>
<td>12-Nov</td>
<td>R</td>
<td>24</td>
<td>11. How can we prevent or manage plant disease epidemics (255-297)&lt;br&gt;Principles of disease management – Part 1</td>
<td></td>
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<tr>
<td>17-Nov</td>
<td>T</td>
<td>25</td>
<td>11. How can we prevent or manage plant disease epidemics (255-297)&lt;br&gt;Principles of disease management – Part 2</td>
<td></td>
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<tr>
<td>19-Nov</td>
<td>R</td>
<td>26</td>
<td>11. How can we prevent or manage plant disease epidemics (255-297)&lt;br&gt;Principles of disease management – Part 3&lt;br&gt;<strong>HW #10 due</strong></td>
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<tr>
<td>24-Nov</td>
<td>T</td>
<td>27</td>
<td>MINI EXAM #5&lt;br&gt;Term paper Final draft due</td>
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<tr>
<td>26-Nov</td>
<td>R</td>
<td></td>
<td><strong>THANKSGIVING HOLIDAY (NO CLASS)</strong></td>
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<tr>
<td>1-Dec</td>
<td>T</td>
<td>28</td>
<td>Review Session</td>
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<tr>
<td>6-Dec</td>
<td>SAT</td>
<td>-</td>
<td><strong>FINAL EXAM (7:30 am – 10:00 am)</strong></td>
<td></td>
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</tr>
</tbody>
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INSTRUCTOR:

Dr. Jason E. Woodward

Offices: Campus- Agricultural Science, Room 211

Texas A&M AgriLIFE Research and Extension Center
1102 East FM 1294, Lubbock, TX 79403
(From I-27, take Exit 11, and go east ~½ mile)

Office hours:
Monday: by appointment
Tuesday: 9:30 am - 12:00 pm; 2:00 pm - 5:00 pm
Wednesday: by appointment
Thursday: 7:00 am - 8:00 am; 3:30 pm - 5:00 pm
Friday: by appointment

Phone: 806-632-0762 (cell)
E-mail: jewoodward@ag.tamu.edu

TEXT:


2. Additional materials from alternate sources will be provided by the instructor when required.

COURSE DESCRIPTION:

Plant pathology is the study of plant diseases. PSS 4425 –Agricultural Plant Pathology will provide students with a comprehensive introduction to the discipline of plant pathology. The course will focus on plant disease symptomology, proper diagnosis, different pathogen groups and lifecycles, as well as cultural and chemical management options. Various pathosystems will be used to educate students on the aforementioned aspects of the course. Specific course objectives will include:

- An overview and understanding of basic concepts and principles of plant pathology, and their influence on disease development and management
- The importance of pathogen populations and environmental conditions on disease severity
- Specific areas to be covered will include disease diagnosis and management in row, vegetable, and greenhouse crops, as well as tree, ornamental, nursery, and turfgrass systems.
COURSE PURPOSE:
This course will provide students with a general understanding of applied plant pathology that will allow them to function in various agricultural careers. The principles learned in this course can be used by farmers, industry personnel, crop consultants, and extension personnel.

EXPECTED LEARNING OUTCOMES:
Upon completion of this course, students will be able to understand basic plant pathology concepts and principles, and apply that knowledge in making disease management decisions.

METHODS FOR ASSESSING THE EXPECTED LEARNING OUTCOMES:
The instructor will issue topic related homework, quizzes, exams, classroom discussions, and written assignments to assess the learning outcomes.

Quizzes will be given unannounced at the beginning of class and will be turned in after approximately 5 min. Students will not be allowed to take any quiz after they have been taken up.

Homework assignments consisting of terms, concepts and/or written reports will be assigned on Thursday and the following week in a week.

Students will be required to choose a topic of interest write a 7 to 10 page term paper complete with citations in a bibliography. Topics must be turned in to the instructor in class on 8-Sept. To facilitate student efforts in completing this assignment, a detailed outline of the paper and a rough draft must be turned in on 29-Sept and Oct-27, respectfully. A final draft of the paper is due to the instructor prior to the Thanksgiving holiday break on 24-Nov.

Students will be required to provide short write-ups (maximum of 1 page) for five unknown diseases introduced during labs and/or disease specimens found on their own out of class.

Two practical exams, including material covered in lab, will be administered on 1-Oct and 19-Nov.

A comprehensive final exam will be administered in the classroom on Sat 6-Dec from 7:30 am to 10:00 am.
GRADING:

There will be a total of 1200 points for the course (lecture and lab combined) with the following breakout:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance and participation*</td>
<td>100</td>
</tr>
<tr>
<td>Mini-exams</td>
<td>5 × 60</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10 × 10</td>
</tr>
<tr>
<td>Homework assignments</td>
<td>10 × 10</td>
</tr>
<tr>
<td>Term paper</td>
<td>1 × 100</td>
</tr>
<tr>
<td>Lab assignments/reports</td>
<td>5 × 20</td>
</tr>
<tr>
<td>Lab exams</td>
<td>2 × 100</td>
</tr>
<tr>
<td>Comprehensive final</td>
<td>1 × 200</td>
</tr>
<tr>
<td><strong>Total points</strong></td>
<td><strong>1200</strong></td>
</tr>
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<th>Percentage</th>
<th>Points accumulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100</td>
<td>≥ 1080</td>
</tr>
<tr>
<td>B</td>
<td>80-89</td>
<td>960 - 1079</td>
</tr>
<tr>
<td>C</td>
<td>70-79</td>
<td>840 - 959</td>
</tr>
<tr>
<td>D</td>
<td>60-69</td>
<td>720 - 839</td>
</tr>
<tr>
<td>F</td>
<td>≤59</td>
<td>≤ 708</td>
</tr>
</tbody>
</table>

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### PSS 4425 Tentative Class Schedule*

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Lect.</th>
<th>Chapter #, Title (pages)</th>
<th>Homework (HW)</th>
<th>Lab</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-Aug</td>
<td>T</td>
<td>1</td>
<td>General concepts, definitions and historical events (Supp.**)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. What's wrong with my plant (1-20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27-Aug</td>
<td>R</td>
<td>2</td>
<td>7. What are the causes of plant diseases- Abiotic factors (119-139)</td>
<td>HW #1 assigned</td>
<td>1</td>
<td>General lab procedures</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8. What types of plant diseases are there (141-176)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Sep</td>
<td>T</td>
<td>3</td>
<td>6. What are the causes of plant diseases-Parasitic flowering plants</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>5. What are the causes of plant diseases- Viruses (85-106)</td>
<td>HW #2 assigned</td>
<td>2</td>
<td>Field trip</td>
</tr>
<tr>
<td>3-Sep</td>
<td>R</td>
<td>4</td>
<td>5. What are the causes of plant diseases- Viruses (85-106)</td>
<td>HW #2 assigned</td>
<td>2</td>
<td>Field trip</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overview of insect vectors (Supp.**)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-Sep</td>
<td>T</td>
<td>5</td>
<td>MINI EXAM #1</td>
<td>Term paper topic due</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. What are the causes of plant diseases- Bacteria (49-66)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Sep</td>
<td>R</td>
<td>6</td>
<td>3. What are the causes of plant diseases- Bacteria (49-66)</td>
<td>HW #2 due</td>
<td>3</td>
<td>Bacteriology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diagnosis and management of bacterial diseases (Supp.**)</td>
<td>HW #3 assigned</td>
<td>4</td>
<td>Nematology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nematode sampling and thresholds (Supp.**)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-Sep</td>
<td>T</td>
<td>7</td>
<td>4. What are the causes of plant diseases- Nematodes (67-84)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-Sep</td>
<td>R</td>
<td>8</td>
<td>4. What are the causes of plant diseases- Nematodes (67-84)</td>
<td>HW #3 due</td>
<td>4</td>
<td>Nematology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overview of chemical nematicides (Supp.**)</td>
<td>HW #4 assigned</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>22-Sep</td>
<td>T</td>
<td>9</td>
<td>2. What are the causes of plant diseases- Fungi (21-48)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Classification of fungal pathogens (Supp.**)</td>
<td></td>
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</tr>
<tr>
<td>24-Sep</td>
<td>R</td>
<td>10</td>
<td>MINI EXAM #2</td>
<td>HW #4 due</td>
<td>5</td>
<td>Introduction to mycology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diseases caused by Oomycetes (Supp.**)</td>
<td>HW #5 assigned</td>
<td>5</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Overview of seedling diseases (Supp.**)</td>
<td></td>
<td></td>
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<tr>
<td>29-Sep</td>
<td>T</td>
<td>11</td>
<td>Diseases caused by Chytrids &amp; Zygomycetes (Supp.**)</td>
<td>HW #5 due</td>
<td>5</td>
<td>Introduction to mycology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overview of seedling diseases (Supp.**)</td>
<td></td>
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<tr>
<td>1-Oct</td>
<td>R</td>
<td>12</td>
<td>Diseases caused by Basidiomycetes (Supp.**)</td>
<td>HW #5 due</td>
<td>6</td>
<td>LAB EXAM #1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Root rot and wood rots (Supp.**)</td>
<td>HW #6 assigned</td>
<td>6</td>
<td>Basidiomycete diseases</td>
</tr>
<tr>
<td>6-Oct</td>
<td>T</td>
<td>13</td>
<td>Diseases caused by Basidiomycetes (Supp.**)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Rust, bunt and smut (Supp.**)</td>
<td></td>
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<tr>
<td>8-Oct</td>
<td>R</td>
<td>14</td>
<td>Diseases caused by Ascomycetes (Supp.**)</td>
<td>HW #6 due</td>
<td>7</td>
<td>Ascomycete diseases</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ascomycete fruiting structures (Supp.**)</td>
<td>HW #7 assigned</td>
<td>7</td>
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</tr>
<tr>
<td>13-Oct</td>
<td>T</td>
<td>15</td>
<td>MINI EXAM #3</td>
<td>HW #7 due</td>
<td>8</td>
<td>Ascomycete diseases</td>
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<td></td>
<td></td>
<td></td>
<td>Diseases caused by Ascomycetes (Supp.**)</td>
<td>HW #8 assigned</td>
<td>8</td>
<td></td>
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<tr>
<td>15-Oct</td>
<td>R</td>
<td>16</td>
<td>Asexual forms of fungi (Supp.**)</td>
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<td></td>
<td></td>
<td>Overview of fungal diseases (Supp.**)</td>
<td>HW #7 due</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>20-Oct</td>
<td>T</td>
<td>17</td>
<td>Chemical management of fungal diseases (Supp.**)</td>
<td>HW #8 due</td>
<td>8</td>
<td>Ascomycete diseases</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Development and implications of fungicide resistance (Supp.**)</td>
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<tr>
<td>22-Oct</td>
<td>R</td>
<td>18</td>
<td>10. How do people influence plant disease epidemics (227-254)</td>
<td>HW #8 due</td>
<td>9</td>
<td>Epidemiology</td>
</tr>
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<td></td>
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<td></td>
<td>Historical perspective of plant disease epidemiology (Supp.**)</td>
<td>HW #9 assigned</td>
<td>9</td>
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<td></td>
<td>Modeling disease epidemics (Supp.**)</td>
<td>HW #9 assigned</td>
<td>9</td>
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</tr>
<tr>
<td>29-Oct</td>
<td>R</td>
<td>20</td>
<td>9. How do plants interact with pathogens (177-225)</td>
<td>HW #9 due</td>
<td>10</td>
<td>Pathogen ecology</td>
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<td></td>
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<td></td>
<td>Ecological interactions (Supp.**)</td>
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</tbody>
</table>

* Semester course. ** Supp. indicates supplement.
<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Time</th>
<th>Event Details</th>
</tr>
</thead>
</table>
| 3-Nov    | T   | 21    | **MINI EXAM #4**  
9. How do plants interact with pathogens – Physiological interactions (177-225) |
| 5-Nov    | R   | 22    | 9. How do plants interact with pathogens (177-225)  
Genetic interactions – Part 1 (Supp.**)  
*HW #10 assigned* |
| 10-Nov   | T   | 23    | 9. How do plants interact with pathogens (177-225)  
Genetic interactions – Part 2 (Supp.**) |
| 12-Nov   | R   | 24    | 11. How can we prevent or manage plant disease epidemics (255-297)  
Principles of disease management – Part 1 |
| 17-Nov   | T   | 25    | 11. How can we prevent or manage plant disease epidemics (255-297)  
Principles of disease management – Part 2 |
| 19-Nov   | R   | 26    | 11. How can we prevent or manage plant disease epidemics (255-297)  
Principles of disease management – Part 3  
*HW #10 due* |
| 24-Nov   | T   | 27    | **MINI EXAM #5**  
Term paper Final draft due |
| 26-Nov   | R   |       | **THANKSGIVING HOLIDAY (NO CLASS)** |
| 1-Dec    | T   | 28    | Review Session |
| 6-Dec    | SAT |       | **FINAL EXAM (7:30 am – 10:00 am)** |

*Changes in scheduling and or content may be made at any time at the discretion of the instructor.

** Denotes instances when supplemental information will be provided.
INSTRUCTOR: Dr. Peter Dotray

Students need to use the email system within Blackboard as source of one-on-one electronic communication. Weekly threaded discussions are located within each weekly module.

Texas Tech Office Number: 806-834-3685


COURSE DESCRIPTION

In this course we will study weeds and weed control methods in agronomic and horticultural crops with an emphasis on chemical weed control. The course is divided into lecture and laboratory sections. The lecture portion will count three-fifths (3/5) of your total grade and the laboratory portion will count for the remaining two-fifths (2/3). In lecture, we will discuss the history of weed control, weed characteristics, weed competition, and methods of weed control including mechanical, cultural, biological, and chemical. Herbicides will be discussed by family with specific regard to their chemical structure, efficacy, mode and mechanism of action, crop selectivity, soil activity and persistence, and cost. In lab, we will examine the practical aspects of weed control including weed seed and plant identification, sprayer equipment, sprayer calibration, herbicide formulations, herbicide labels, crop/weed response to herbicides and injury symptomology, and Worker Protection Standards.

COURSE PURPOSE

The purpose of this course is to introduce students to the principles necessary to achieve successful weed management in agronomic, horticultural, and urban environments.

EXPECTED LEARNING OUTCOMES

1. Understand the evolutionary history of weed control in the United States.
2. Identify characteristics that make weeds successful invaders.
3. Understand the magnitude of weed problems and losses resulting from weeds.
4. Classify herbicides based on their mode of action.
5. Understand herbicide selectivity and metabolism.
6. Understand the environmental and cultural influences on herbicide activity.
7. Understand both state and federal weed, seed and pesticide laws.
9. Identify weeds based on morphological characteristics.
10. Calibrate a weed sprayer.
11. Recognize herbicide induced injury based on mode of action.
METHODS FOR ASSESSING THE EXPECTED LEARNING OUTCOMES
The expected learning outcomes for the course will be assessed through mid-semester exams, projects, and final exams.

EXAMINATIONS
In lecture, there will be two hourly exams worth 100 points each and the final comprehensive exam worth 200 points. In laboratory, there will be two hourly exams worth 100 points each and the final comprehensive exam worth 100 points. Each exam will primarily include objective-type questions (multiple choice, multiple answer, true/false, matching). Mid-semester lecture exam dates are September 28-29 and November 2-3, and the final exam will take place on Dec 4-5. To reduce proctor costs, laboratory exams will take place at the same time (proctor appointment) as the lecture exams. There are NO MAKE-UP EXAMS.

PROCTOR FOR EXAMS
Exams must be administered by a proctor. The choice of proctor must follow the University and Department guidelines (see section below on Proctor Policy). Please send Diann Merriman (diann.merriman@ttu.edu) your proctor information (name, title, work address, work phone number, and email address) by September 8. Specify which class(es) will be proctored by each person. If you have questions regarding the University and Department guidelines, please visit with Diann.

PROCTOR POLICY
The Department of Plant and Soil Science requires that each distance student select a proctor for the current semester. All proctors must be approved by the department (proctor information deadlines will be determined by the instructor for each course). A list of college test centers that proctor exams is available at www.ncta-testing.org/cctc (click on find a participant; click on the state in which you need to find a testing location). Additional professionals eligible to proctor exams are academic counselors, librarians, military education officers or other pre-approved full-time education professionals. All proctors have a responsibility to facilitate fairness and maintain the academic integrity of the testing process. Therefore, the proctor may not have a personal relationship with the student. Any proctoring fees are the responsibility of the student and these fees will vary.

PLANT COLLECTION
An electronic weed collection of twenty (20) weeds will need to be assembled. Two (2) or more digital photos per species showing enough detail to make a definitive plant identification. Try to include vegetative and reproductive structures. Each weed must be identified with common name, scientific name, family, date of collection, location of collection, and name of photographer. An additional 2 to 3 sentences of information is required for each weed collected (origin, name sake, key morphological features, locations found, etc.). The majority of weeds should come from the weeds discussed in class. An early start is strongly suggested. Electronic collections are due by November 20.
TERM PAPER
Graduate students (PSS 5429) must complete a term paper 5 pages in length. The topic must be agreed upon by the instructor. This paper is due by November 25. Term papers will address an important and/or current topic in weed science. Term paper topic areas must be discussed with the instructor prior to submission. Selected term papers will be used as part of the last module lessons. This assignment is worth 100 points.

GRADING
Lecture (Total multiplied by 66.667%):
- Hourly Exams 2 @ 100 pts = 200
- Final Exam 1 @ 200 pts = 200
- TOTAL 400*

*Graduate student total will be 500 due to the addition of a 100 pt Term Paper.

Laboratory (Total multiplied by 33.333%):
- Hourly Exams 2 @ 100 pts = 200
- Plant Collection 1 @ 100 pts = 100
- Final Exam 1 @ 100 pts = 100
- TOTAL 400

TOTAL POINTS POSSIBLE THIS SEMESTER: 800 (900 FOR GRADUATE STUDENTS)

Grades are normally based on the following:
90-100% - A
80-89% - B
70-79% - C
60-69% - D
<60% - F
ADDITIONAL GENERAL INFORMATION

A. There will be no extra credit offered in this course.

B. "The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from "AccessTECH" located in the Counseling Center. No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: http://www.accesstech.dsa.ttu.edu/default.asp

C. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction.

PLEASE SEE THE MODULE SCHEDULE LINK WITHIN BLACKBOARD FOR THE WEEKLY LESSON SCHEDULE AND ASSESSMENT DUE DATES.
PSS 6323 – Plant Water Relations

Instructor: Dr. Glen Ritchie  Phone: (806) 632-5424  
Office: PSS Room 203  E-mail: glen.ritchie@ttu.edu  
Office Hrs: Appointment

Optional Text:
Principles of Soil and Plant Water Relations, by M.B. Kirkham (not required – for reference only)  

Description:
Plant Water Relations is designed to teach graduate students about water demand and movement in the soil-plant-atmosphere continuum. Course content will include projects, quizzes, and tests.

Goals and Objectives:
• Develop an understanding of plant water balance

Assessment:
Your performance in the course shall be evaluated on completion of assignments and exams. You must complete all coursework to receive a grade for the course. See the table below for information on assignments, point values, grading scale and total points for the course. Please note that this schedule is tentative and subject to change.

Exam Dates - Tentative

Tuesday, March 3

April 5

Final – 3:30 pm, Friday, May 10; I may schedule as a take-home
Point Distribution

<table>
<thead>
<tr>
<th>Title</th>
<th>Quantity</th>
<th>Points Each</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Exams (inc. Final)</td>
<td>3</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>Research Project</td>
<td>1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Quizzes/</td>
<td>~10</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>500</td>
</tr>
</tbody>
</table>

Scores for individual tests and assignments may not be exactly the same as the number of points listed above. In these cases, the percentage on the test or assignment will be scaled to the point distribution above, unless otherwise announced prior to the test or assignment.

Grading Scale

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Points</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>450-500</td>
<td>90-100%</td>
</tr>
<tr>
<td>B</td>
<td>400-449</td>
<td>80-89%</td>
</tr>
<tr>
<td>C</td>
<td>350-399</td>
<td>70-79%</td>
</tr>
<tr>
<td>D</td>
<td>300-349</td>
<td>60-69%</td>
</tr>
<tr>
<td>F</td>
<td>&lt;=299</td>
<td>0-59%</td>
</tr>
</tbody>
</table>
Tentative Course Lecture Schedule (Subject to Change):

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/15</td>
<td>Overview of Plant water relations; how much water do we need?</td>
</tr>
<tr>
<td>2</td>
<td>01/20-01/22</td>
<td>Water Usage in the United States; The SI System and Unit Conversion</td>
</tr>
<tr>
<td>3</td>
<td>01/27-01/29</td>
<td>Structure and properties of water; Movement of water in soil pores; soil water content and water potential</td>
</tr>
<tr>
<td>4</td>
<td>02/03-02/05</td>
<td>Field capacity, wilting point, available water, and non-limiting water range</td>
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<tr>
<td>5</td>
<td>02/10-02/12</td>
<td>The van Genuchten model and Physiological Effects of water</td>
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<tr>
<td>6</td>
<td>02/17-02/19</td>
<td>Plant growth analysis and water use curves</td>
</tr>
<tr>
<td>7</td>
<td>02/24-02/26</td>
<td>Water use efficiency</td>
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<tr>
<td></td>
<td>03/03</td>
<td>TEST 1</td>
</tr>
<tr>
<td>8</td>
<td>03/05</td>
<td>Radiation capture, energy balance, and effects on water relations</td>
</tr>
<tr>
<td>9</td>
<td>03/10-03/12</td>
<td>Stomatal dynamics, stomatal closure, and roots; roots and plant nutrition</td>
</tr>
<tr>
<td>10</td>
<td>03/17-03/19</td>
<td>Spring Break</td>
</tr>
<tr>
<td>11</td>
<td>03/24-03/26</td>
<td>Weather Stations, Diffusion, and Transpiration</td>
</tr>
<tr>
<td>12</td>
<td>03/31-04/02</td>
<td>Reference ET, crop ET, and the Penman-Monteith Equation</td>
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<td></td>
<td>4/05</td>
<td>TEST 2</td>
</tr>
<tr>
<td>13</td>
<td>04/09</td>
<td>Pan evaporation method of irrigation scheduling</td>
</tr>
<tr>
<td>14</td>
<td>04/14-04/16</td>
<td>Irrigation systems</td>
</tr>
<tr>
<td>15</td>
<td>04/21-04/23</td>
<td>Instruments: Granular Matrix Sensors and Capacitance probes.</td>
</tr>
<tr>
<td>16</td>
<td>04/28-04/30</td>
<td>Instruments: tensiometers, TDR. Neutron Probes and Thermal Sensing of Temperature</td>
</tr>
<tr>
<td>17</td>
<td>05/05</td>
<td>Salts</td>
</tr>
</tbody>
</table>

General Information

A. Missed exams will be recorded as "0" unless you contact me before the next class period concerning your absence. However, you must have a reasonable excuse (documented illness, death in the family, etc.) before a make-up exam will be considered.

B. Material turned in late will be penalized 10% for each day beyond the due date.

C. There will be NO extra credit offered in this course. Please do not ask.

D. “The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate, please contact the instructor. Students should present appropriate verification from “AccessTECH” located in the Counseling Center.
No requirement exists that accommodations be made prior to completion of this approved University process." The URL for AccessTECH is located at: http://www.accesstech.dsa.ttu.edu/default.asp

E. Integrity and professionalism is expected at this level of education. Collaboration on assignments other than as specified, as well as dishonesty on exams, will not be tolerated. The guidelines set forth by the University will be followed with any infraction.

F. “Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor; students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class."

G. Online learners are expected to maintain professionalism in communication at all times. Discussion forums and email messages should be courteous, grammatically correct and well proofed. Profanity, slang and flaming will not be tolerated.

**Examinations:**
Assessment in this course will consist of two hourly exams during the semester and one final exam. The exams are each worth 100 points, for a total of 300 points allotted to exams. You may expect multiple-choice, fill in the blank, short answer, listing, long answer, calculations, conjectures, philosophy, horse sense, cow sense, and non-sense questions.

This course does not require proctors for exams. However, I reserve the right to post the exams on Blackboard with a time limit, or to give the exams as take homes with a time limit for the return of the exams.

**Crop Research Projects:**
You will be assigned a research project on an aspect of plant water relations, worth 100 points. You will be graded on writing, information collection and integration, calculations, and sources. I may assign part or all of a lecture to your topic and give you the chance to present your findings.

**Quizzes**
Quizzes will be scheduled or random, at my discretion. They do not need to be proctored, but I expect honesty and the ability to follow instructions. It is anticipated that there will be 10 quizzes during the semester. There will be no make-ups. If there are more than 10 quizzes, your
lowest scores will be dropped up to the point where 10 are graded. Each quiz is worth 10 points, unless I say otherwise.
Instructor: Jennifer Moore-Kucera, Ph.D.  
Jennifer.moore-kucera@TTU.EDU  
Office: 201 PSS (back office)  
Office phone: 742-2838 (ext.236)  
Cell: 806-782-3039  
Office Hours: TBA first week of classes  
By appointment  
Open door policy

Prerequisite: PSS 2432

Course Description:  
Environmental issues are of paramount importance to contemporary society. Critical issues facing society include food security, loss of soil and water resources, degradation of ecosystem services, energy security and climate. In order to understand and meet the needs of a growing population and balance environmental quality, science-based soil management decisions are essential. Indeed, consideration of environmental consequences is an important component of decision making processes for citizens, companies, and governments at nearly all levels. This course will focus on the role of soil science in the environmental arena with a specific emphasis on soil management in agriculture and urban environments.

Course Purpose:  
The purpose of this course is to develop an understanding of the role of soil within the environment. The course is designed around three areas of study: 1) an investigation of the issues of soil and water resources in society; 2) the basic principles underlying soil and water management and conservation; and 3) soil management strategies in agriculture and urban environments.

Capstone Status: This is not a capstone course.

**Blackboard (http://www.blackboard.ttu.edu):** I will be using Blackboard A LOT. It is expected and assumed that you will **check it daily!**

Ability to log onto Springerlink through TTU (must set up a VPN account on your personal computer). See TTU IT help pages for details.

**Optional resources:**


Other reference materials will be provided as needed.

**Expected Learning Outcome:**

Upon completion of this course, the student will be able to:

- Explain and critically evaluate the societal and environmental issues related to soil as a natural resource.
- Describe the basic principles of soil and water management and conservation.
- Describe practical soil management practices in agricultural and urban environments.

**Methods for Assessing the Expected Learning Outcomes:**

There will be **2 one-hour tests during the semester** and a **comprehensive final report and presentation (in groups for undergrads and independently for grads)** due at the end of the semester. The dates of the one-hour semester tests have been tentatively assigned in the schedule and may be moved at the discretion of the instructor. Any change to these tentative dates will be announced at least 1 week in advance. Material for the tests will be taken from lecture materials, discussions, handouts, homework, and reading assignments. The tests will consist of short answer/essay questions. Some calculations may be included. Additionally, homework exercises will be assigned to ensure students remain on task and comprehend lecture and assigned reading materials. PSS 6331 students will additionally participate in journal article critiques and discussion (online and live). These discussions will account for an additional 60 pts for PSS 6331 students only.
Further details regarding the term paper and lecture presentation will be given during class.

**Final Group Project:**

**PSS 4337:** Working in teams of 3-4, choose one of the following types of soil degradation and develop 1-2 strategies to remediate the problem in two different ‘environments.’ Your group will turn in a final report (details will be provided within the first 2 weeks of the course) including a bibliography with peer-reviewed journal articles, and a 20-min group presentation.

**PSS 6331:** same project except you will work independently.

Soil degradation types:

- **Water erosion**
  - Loss of topsoil
  - Terrain deformation/mass movement
  - Off-site effects (e.g. water pollution)
  - Reservoir sedimentation
  - Flooding
  - Coral reef destruction

- **Wind erosion**
  - Loss of topsoil
  - Terrain deformation
  - Overblowing

- **Chemical deterioration**
  - Loss of nutrients and/or organic matter
  - Salinization
  - Acidification
  - Pollution
  - Acid sulfate soils
  - Eutrophication

- **Physical deterioration**
  - Compaction, sealing, and crusting
  - Water logging
  - Lowering of water table
• Subsidence of organic soils
• Mining or urbanization disturbances (from a physical perspective)

• Degradation of biological activity
  • E.g. revegetating drastically disturbed areas (construction, mining, sand dunes, etc.)
  • Bioremediation efforts with microbes and/or vegetation on polluted sites

‘Environments’ can be different soil types in the same climate zone or different climate zones with the same soil types or different land uses such as agronomic, pasturelands, rangelands, forestlands, urbanlands, etc. **You will need to use web soil survey** or hard copy versions to describe the soil and area of your choosing (stay within USA unless prior approval is granted).

A session on peer-reviewed journal articles will be provided for you (in lecture and/or via on-line resources). Make sure you understand this concept, how to find these articles and how to properly cite them in a bibliography (use APA format).

Outside the box ideas are encouraged. Please visit with me prior to finalizing any non-traditional project. Some ideas might include: Impacts of soils on human health; interviewing, and videotaping visits to local producers/ranchers/construction companies to discover how they combat/prevent/remediate soil degradation issues. Interview NRCS agents to discover the types of government programs available to assist landowners/managers with soil conservation issues. Multiple sites/people will be required for interview-focused projects. Get creative!
Course Assignments and Grading Procedures:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>% of grade for 4337 students</th>
<th>% of grade for 6331 students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 one-hour exams</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Final report</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Final presentation</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Homework assignments (5-8)</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Journal discussions</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Point Distribution:
90-100% A
80-89% B
70-79% C
60-69% D
< 60% F

Attendance/Participation policy:
You benefit by attending lecture regularly and developing professional work habits. I will only guarantee posting of lecture material to distance students. I reserve the right to make this material available to students enrolled in the ‘live’ version.

Excused absences are granted only for the following reasons: personal illness, the illness of a dependent, the death or funeral of an immediate family member, or required attendance at an official university activity. Work or activities for other classes are not excused. To be classified as excused, the absence must be documented authoritatively (for example, an illness must be documented by a doctor’s note). If you will be absent due to trips officially approved by the university (including religious holidays), you must notify me in writing (not by email) no later than one week prior to the absence so we can work out schedule rearrangements. You will not be penalized for official absences.

When you miss a class period, it is your responsibility to contact a member of the class for class information, reading or writing assignments. Unless, pre-approved by Dr. Kucera, it is your responsibility to complete any assigned work regardless of your absence. Failure to do so will result in a zero for that assignment. In other words, you are responsible for assigned work even if you are absent. An absence is not an automatic excuse for not completing any class assignment.

Late assignments: One (1) letter grade deduction for each day assignment is late.
**Academic misconduct and your grade** (see below for further details): Cheating or plagiarism of any kind will result in zero points for the assignment and or an "F" in the course. I also reserve the right to inform the Academic Affairs office of any academic misconduct by students. Students are encouraged to review the official university policy regarding academic misconduct found in the undergraduate bulletin.

**Exam attendance**: If you are within 50 miles of the TTU campus, you are expected to come in and take your exams at the scheduled time. If you are further away than 50 miles, please contact me within the first week of classes to determine if you need a proctor. On the day of the exam, if there are any problems accessing your exam, please call immediately! Take my contact information with you to the exam.

**General Information**

“Students are expected to assist in maintaining a classroom environment which is conducive to learning. In order to assure that all students have an opportunity and gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from using cellular phones or beepers, eating or drinking in class, making offensive remarks, reading newspapers, sleeping or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a request to leave class”.

People must treat each other with **dignity and respect** in order for scholarship to thrive. *Behaviors that are disruptive to teaching and learning will not be tolerated*, and will be referred to the Student Judicial Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.

**Academic Regulations**

Please refer to the “Code of Student Conduct” and Student Handbook of Texas Tech University available at [www.studentaffairs.ttu.edu](http://www.studentaffairs.ttu.edu) or [www.depts.ttu.edu/studentjudicialprograms](http://www.depts.ttu.edu/studentjudicialprograms) for further information regarding student conduct and students with disabilities.

This course is governed by the Texas Tech University academic integrity policy as elucidated at the following URL:


**Academic Integrity**: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and
administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.

“Scholastic dishonesty” includes, but not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student or the attempt to commit such an act.

**Cheating:** Dishonesty on examinations, quizzes, or homework assignments; illegal possession of examinations, the use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry to or unauthorized presence in an office are instances of cheating.

**Plagiarism:** Offering the work of another as one’s own, without proper acknowledgement, is plagiarism; therefore any student who fails to give credit for quotations or an essentially identical expression of material taken from books, encyclopedias, magazines, and other reference works, or from the themes, reports, or other writings of a fellow student, is guilty of plagiarism.

**STUDENTS WITH DISABILITIES**

“Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.”

**GENERAL POLICIES (Mainly applies to ‘live’ classroom, however, ‘net-etiquette’ (see below) is also expected for any on-line interactions)**

“Students are expected to assist in maintaining a classroom environment which is conductive to learning. In order to assure that all students have an opportunity and gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from using cellular phones or beepers, eating or drinking in class, making offensive remarks, reading newspapers, sleeping or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in, minimally, a request to leave class”.

PSS 4337/6331 Sp 2014 Syllabus Page 7 of 9
People must treat each other with **dignity and respect** in order for scholarship to thrive. *Behaviors that are disruptive to teaching and learning will not be tolerated*, and will be referred to the Student Judicial Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.

As a member of TTU and this class, you have a responsibility to create and maintain an environment that is conducive to learning for EVERYONE! The following individual actions are disruptive to the learning environment for everyone:
- your cell phone ringing
- using your cell phone for text messaging etc.
- using other devices like ipods etc.
- any distracting behavior while others are trying to speak, read, think or concentrate
- sleeping
- coming in late to class without permission
- leaving class early without permission
- reading other material (e.g. newspaper, books, notes from other classes, computer)
- derogatory or insulting comments
- any other activity that prevents your peers from getting the classroom experience that they have paid for and deserve

**Netiquette** refers to “Network Etiquette”. It is the way one should behave when sending email, posting to threaded discussions, or chatting online.

**Here are some basic rules to help you get the most out of your online learning:**
- **ALL CAPS IMPLIES THAT YOU ARE SHOUTING** - Please do not do this.
- Watch your “tone” – it is written, not verbal communication. It can be very easy to misinterpret someone’s meaning online.
- Check spelling - Always!
- Make your messages easier to read by making your paragraphs short and to the point.
- Never “say” anything that you would not want posted on the wall of a face to face classroom, because it could be!
- Behave as you would in a face-to-face classroom.
- Remember there is a real live person at the other end reading your posts and email. Treat them with respect.
- Foul language, insults and harassment are not tolerated (just as it would not be tolerated in a face to face classroom).
- Think about what you have written before you submit it.
***You are required to take the syllabus quiz on BB. Please read the entire syllabus and then take the quiz. By taking this quiz, you acknowledge that you have received, read in its entirety, and accept the conditions described in the syllabus.

You must take this quiz before exam 1!

Entries submitted beyond the 1/31/2014 deadline will result in zero points for the quiz but will enable the student to proceed with the course.
PSS 4331 Soil Microbial Ecology (3:3:0)
PSS 6432 Advanced Soil Microbial Ecology (4:3:2)
Spring 2013 Syllabus

Prerequisite course: PSS 2432, introductory biology or microbiology, or instructor permission.

Lecture Instructor
Dr. Jennifer Moore-Kucera
Office: Plant Science Building (PSS) Room 201 (back office)
Lab: PSS 210
Phone: 806-742-2838 ext 236
Email: Jennifer.moore-kucera@ttu.edu (use only prior to semester begins and in ‘emergencies.’ For all other correspondence, please use email through BB).

Office Hours
Three options:
1) Office hours TBA first week of classes.
2) If my office door is open, please feel free to knock and come in (if it is closed and you think I am there, please try back at a later time)
3) Call or email to make an appointment

Class Location
PS 108 (lecture)
PSS 109 (lab/discussion)

Class Time
Lecture (4331 and 6432 students): 11:00am-12:20pm TR
Lab/discussion for PSS 6432 students ONLY: TBA

Required materials for this class

- **Access to Blackboard (BB):** [http://www.depts.ttu.edu/lms/index.php](http://www.depts.ttu.edu/lms/index.php) When applicable, course materials and assignment information will be provided on BB. It is your responsibility to check BB no less than on Mondays and Fridays (i.e., before and after the lectures for the week). If you need to contact me, please use the email service through BB.
- **Simple calculator**
Optional References

- The Living Soil, Science Publishers Inc. (Gobat et al., 2004)
- Introduction to Soil Microbiology by Mark Coyne, Cengage Learning

Course Description

Advanced soil microbial ecology is a 4-credit course with a focus on the interactions and functions of soil biota as they relate to nutrient cycling, remediation, and climate change in terrestrial ecosystems. The course consists of two 1.5-hour lectures and one 2-hour discussion/lab session each week. The ‘lab’ will be crafted to meet the specific needs of the students for each semester. Activities might include: a discussion and analysis of journal articles led by the students, creation of mock grant proposal and review, and/or specific laboratory activities or mini research project. My goal is to make this course enjoyable, challenging, and stimulating.

Course Purpose

The purpose of this course is to create an enhanced appreciation and understanding of the diversity of microorganisms living in the soil and how they perform key ecosystem services. This course is designed to meet the needs of students interested in agricultural and environmental sciences and natural resources management.

Learning Outcomes/Objectives

Upon successful completion of this course students will be able to:

- Describe how soil microorganisms are key players in soil ecosystem functions and the current methodologies utilized to isolate and identify soil microorganisms
- Identify the roles of organisms involved in biogeochemical cycles in relation to plant nutrition and environmental quality
- Define how soil microorganisms and their associated functions are altered by human-induced and natural occurrences
- Identify how soil microbes are integral components of global climate cycles
- Write effectively about scientific topics within the discipline
- Critically assess peer-reviewed journal articles
- Describe novel methods used in the field of applied soil ecology
**Methods for assessing the expected learning outcomes**

The learning outcomes for the course will be assessed through the following methods:

**Grading for PSS 4331**

**Tests (2) (40%)** two hourly exams during the semester will test knowledge of all material including homework and class discussions preceding the previous exam.

**Final (20%)** One comprehensive final during scheduled finals week will test all material covered throughout the semester but will focus on highlighted concepts and learning objectives.

**Homework (20%)** Periodically, homework assignments will be posted on Blackboard or described during lecture. In general, assignments will be due one week from the assignment date by the beginning of class unless otherwise stated. Submissions must be uploaded to Blackboard unless otherwise stated. Homework assignments can be turned in ONE CLASS DAY LATE for ½ credit. Assignments turned in after this time, will be receive a grade of zero.

**Annotated bibliography (25%)** Details are provided at the end of the syllabus. Topics are due by the third full week of classes and must be pre-approved by Dr. Kucera. Due dates will be provided the first day of class and will be strictly enforced.

**Format For Turning In Written Work**

Unless indicated otherwise, the text (body) of all written work to be turned in is to be typed in size 12 Times New Roman or Arial font and double-spaced with 1-inch margins all the way around. Name, date, title, other heading information and citations must be single-spaced. Pages are to be printed in black ink only on white paper. Pages that are not stapled together or that do not have a name will not be accepted or graded. Please print double-sided whenever possible (save a tree).

**Grading for PSS 6432**

**Tests (2) (40%)** two hourly exams during the semester will test knowledge of all material including homework and class discussions preceding the previous exam.

**Final (20%)** One comprehensive final during scheduled finals week will test all material covered throughout the semester but will focus on highlighted concepts and learning objectives.

**Homework (10%)** Assignments will reinforce lecture or discussion/lab meetings and may or may not be the same assignments as students enrolled in PSS 4331. Regardless of the assignment, completed work will be due one week from the assignment date by the beginning of class unless otherwise stated. Submissions must be uploaded to Blackboard unless otherwise stated.
Journal reviews (15%) For the discussion of journal articles, students will choose two pre-approved articles to lead a discussion at the beginning of the term. During each session, two students will present an overview of one of their pre-approved journal articles including methods used, important findings, and the validity and significance of conclusions. A discussion and analysis by all students will follow. Students are required to actively participate in discussion of the paper. Some useful websites are at the end of this document which may prove useful. The lead student will hand-in a written overview of the article (no more than two pages) that addresses the following questions:

a. What are the novel point(s) of the paper?
b. What did you learn most from the paper?
c. How would you have done the study differently? For review articles discuss how you would have structured the paper differently, included different topics, or had a different emphasis. Explain why you would make the differences.
d. Does the discussion effectively address the objectives? How would you have analyzed them differently or altered the discussion.

Project (15%) The discussion sessions will include 2 hours dedicated to a discussion and analysis of a peer-reviewed journal articles (see above) in the discipline of soil ecology. Additionally, students will create a mini-project that will be pre-approved by Dr. Kucera at the beginning of the semester. Options include: grant proposal to NSF or USDA; research project utilizing specific laboratory analyses; term paper/presentation or other work.

Format For Turning In Written Work

Unless indicated otherwise, the text (body) of all written work to be turned in is to be typed in size 12 Times New Roman or Arial font and double-spaced with 1-inch margins all the way around. Name, date, title, other heading information and citations must be single-spaced. Pages are to be printed in black ink only on white paper. Pages that are not stapled together or that do not have a name will not be accepted or graded. Please print double-sided whenever possible (save a tree).

Late Assignments for PSS 6432 Students: No such thing. Meeting deadlines is an integral part of ‘real world’ scenarios and a reflection of your professional integrity. Unless indicated otherwise, all assignments are due at the beginning of class on the designated due date.

Grade Distribution:

A = 90.0 to 100%
B = 80.0 to 89.9%
C = 70.0 to 79.9%
D = 60.0 to 69.9%
F = < 59.9%

Instructor reserves the right to adjust the grade distributions.
You may be permitted to take make-up exams and quizzes if: (1) you have a valid excuse for missing the test, **AND** (2) you notify me at least 24 hours **before** the test to let me know why you'll be missing it. Note that I will be understanding, but not overly lenient on this matter. Tests will not be curved, but overall class performance will be considered and grade adjustments made, if necessary. Such adjustments will NOT lower any grades.

**Attendance Is Mandatory.** Students may only be excused for official university-sponsored events or in observance of religious holidays as described by OP 34.19 but must provide written documentation in advance.

**What Happens If I Miss A Class Period?**

It is the learner’s responsibility (that’s you) to collect from your peers any material, notes, handouts or information missed due to absence. Please do not ask the instructor what you missed, however, it is recommended that you make an appointment or come during office hours if you have any questions after reviewing missed material.

**Electronic devices and student conduct**

Use of any electronic device must be pre-approved by the instructor. In general, all phones, MP3 players, ipads, etc. must be turned off and put away during lessons. A simple rule to live by is to treat the classroom as an airplane during take-off and landing; anything with an on/off switch must be completely powered down. Students caught using a non-approved electronic device during lessons will be asked to leave the classroom and may lose points. Any use of non-approved electronic devices during exams will result in a grade of zero.

**Student Conduct**

People must treat each other with **dignity and respect** in order for scholarship to thrive. *Behaviors that are disruptive to teaching and learning will not be tolerated*, and will be referred to the Student Judicial Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.

**Academic Regulations**

Please refer to the “Code of Student Conduct” and Student Handbook of Texas Tech University available at [http://www.depts.ttu.edu/studentconduct/](http://www.depts.ttu.edu/studentconduct/) for further information regarding student conduct. Any form of academic dishonesty including but not limited to plagiarism, cheating, collusion, will not be tolerated. It is your responsibility to know and understand the rules as outlined in the Code of Student Conduct and operating policies OP 34.12. Ignorance is no excuse!
All written work is to be done INDEPENDENTLY and in YOUR OWN words. If there is evidence of “shared work,” you will receive a ZERO (0) for the assignment and possibly have your academic record marked. LATE ASSIGNMENTS ARE NOT ACCEPTED and you will receive a zero (0).

**Students with Disabilities**

“All student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.” Statement copied from: [http://www.depts.ttu.edu/students/sds/syllabus.asp](http://www.depts.ttu.edu/students/sds/syllabus.asp); accessed 12/31/2012.
**Tentative Lecture Schedule for 2013 (subject to change with advance notification to students at the discretion of the instructor)**

<table>
<thead>
<tr>
<th>Class #</th>
<th>Day</th>
<th>Dates</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R</td>
<td>1/17</td>
<td>Introductions (students, instructor); syllabus overview</td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td>1/22</td>
<td>History of soil microbiology/ ecology</td>
</tr>
<tr>
<td>3</td>
<td>R</td>
<td>1/24</td>
<td>Soil as a biological habitat</td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>1/29</td>
<td>Soil as a biological habitat</td>
</tr>
<tr>
<td>5</td>
<td>R</td>
<td>1/31</td>
<td>Bacteria and Archae</td>
</tr>
<tr>
<td>6</td>
<td>T</td>
<td>2/5</td>
<td>Bacteria</td>
</tr>
<tr>
<td>7</td>
<td>R</td>
<td>2/7</td>
<td>Fungi</td>
</tr>
<tr>
<td>8</td>
<td>T</td>
<td>2/12</td>
<td>Fungi</td>
</tr>
<tr>
<td>9</td>
<td>R</td>
<td>2/14</td>
<td>Algae and cyanobacteria</td>
</tr>
<tr>
<td>10</td>
<td>T</td>
<td>2/19</td>
<td>Fauna</td>
</tr>
<tr>
<td>11</td>
<td>R</td>
<td>2/21</td>
<td>Fauna</td>
</tr>
<tr>
<td>12</td>
<td>T</td>
<td>2/26</td>
<td>EXAM 1</td>
</tr>
<tr>
<td>12</td>
<td>R</td>
<td>2/28</td>
<td>Microbial metabolism and enzymes</td>
</tr>
<tr>
<td>13</td>
<td>T</td>
<td>3/5</td>
<td>Microbial metabolism and enzymes</td>
</tr>
<tr>
<td>14</td>
<td>R</td>
<td>3/7</td>
<td>Carbon transformation and SOM formation</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>3/12</td>
<td>Spring Break! Enjoy and be safe!</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>3/14</td>
<td>Spring Break! Enjoy and be safe!</td>
</tr>
<tr>
<td>15</td>
<td>T</td>
<td>3/19</td>
<td>Carbon transformation and SOM formation</td>
</tr>
<tr>
<td>16</td>
<td>R</td>
<td>3/21</td>
<td>Cellulose and hemicellulose degradation</td>
</tr>
<tr>
<td>17</td>
<td>T</td>
<td>3/26</td>
<td>Degradation of other biopolymers</td>
</tr>
<tr>
<td>18</td>
<td>R</td>
<td>3/28</td>
<td>Degradation of lignin</td>
</tr>
<tr>
<td>19</td>
<td>T</td>
<td>4/2</td>
<td>TBA</td>
</tr>
<tr>
<td>20</td>
<td>R</td>
<td>4/4</td>
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<td>21</td>
<td>T</td>
<td>4/9</td>
<td>Exam 2</td>
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<tr>
<td>22</td>
<td>R</td>
<td>4/11</td>
<td>The nitrogen cycle- overview</td>
</tr>
<tr>
<td>23</td>
<td>T</td>
<td>4/16</td>
<td>The N cycle- mineralization and immobilization</td>
</tr>
<tr>
<td>24</td>
<td>R</td>
<td>4/18</td>
<td>The N cycle- denitrification and nitrification</td>
</tr>
<tr>
<td>25</td>
<td>T</td>
<td>4/23</td>
<td>The N cycle- N2 fixation</td>
</tr>
<tr>
<td>26</td>
<td>R</td>
<td>4/25</td>
<td>Microbial transformations of phosphorus &amp; sulfur</td>
</tr>
<tr>
<td>27</td>
<td>T</td>
<td>4/30</td>
<td>Global climate change and GHGs</td>
</tr>
<tr>
<td>28</td>
<td>R</td>
<td>5/2</td>
<td>Managing soil organisms</td>
</tr>
<tr>
<td>29</td>
<td>T</td>
<td>5/7</td>
<td>Review</td>
</tr>
<tr>
<td></td>
<td>Sat</td>
<td>5/11 (Saturday) 4:30-7:00pm</td>
<td>FINAL EXAM!</td>
</tr>
</tbody>
</table>
Annotated Bibliography Assignment for PSS 4331 Students only:

Topics must be pre-approved by Dr. Kucera by the third FULL week of classes. Please make sure you understand the meaning of ‘peer-review’ and how to find, read, and paraphrase peer-reviewed manuscripts. It is your responsibility to make sure you understand APA citation formatting. Numerous websites are provided for your reference at the end of this document to get you started. Please review and ask questions BEFORE the due dates.

Details:
Choose 15 citations related to the topic previously approved by Dr. Kucera. At least 10 citations must be peer-reviewed scientific manuscripts. Up to 5 citations may be a combination of extension articles, government websites, books, etc. Wikipedia is NOT an acceptable resource.

You must use APA citation format.

The basic concept of an annotated bibliography is to compile a list of sources that you will evaluate about a specific soil microbiology/ecology topic. It is the standard APA citation including a paragraph briefly describing the source. As you write this paragraph, include a summary and an evaluation of the validity of the sources and its usefulness. Paragraphs should be in full sentences 100-300 words.

You must upload the COMPLETE peer-reviewed manuscript in pdf format for all manuscripts reviewed. If you have a hard copy only, you may utilize the free scanner in the library that can convert the document into a pdf. For websites, you must provide the full citation with the date accessed.

Turnitin

Eventually your written drafts and final work will be submitted to this website. I will enroll all of you. The password for the course in turnitin (different from the password you use to login) is 4337_6331.

https://www.turnitin.com/static/index.php

Format:

The format should list the citation (APA format), then the appropriate paragraph annotation followed by the next citation and annotation. All entries should be typed and double spaced.

Here are some examples (NOTE: these are shortened versions. You will need to write 100-300 words for each citation):

Topic: High Tunnel Systems and Plant Diseases


   Epidemics of Botrytis fruit rot and powdery mildew in annual strawberry were compared in large plastic tunnel vs. field production systems. The mean incidence of Botrytis fruit rot was 88 to
94% lower in tunnels than in the field. Further, the incidence of Botrytis fruit rot for the nontreated control in tunnels was less than 2%, which was 89% lower than that of the 7-day captan schedule in the field. This finding indicates that Botrytis fruit rot can be controlled effectively without fungicides in a tunnel cultural system. However, shorter periods of leaf wetness and higher temperatures in tunnels may have also contributed to a higher incidence of powdery mildew on fruit in tunnels compared with open field plots.


Marked strains of Botrytis cinerea were created and assessed for studying dispersal of this fungus inside plant tissue under greenhouse conditions. A strain that was the most aggressive in infecting plants was also the most successful in spreading across the greenhouse, showing the importance of local inoculum from within the greenhouse during the winter. [Note: marked strains of selected plant pathogens could possibly be used in high tunnel versus open field experimental studies during our future CAPs project to measure pathogen spread].


A general treatise on how greenhouse conditions and coverings that absorb near-UV light influence Botrytis sporulation, and the efficacy of other cultural approaches for greenhouse disease control.


This short report describes and outbreak of Fusarium wilt in a commercial muskmelon crop grown in plastic tunnels.


A brief overview of the importance of environmental management in controlling plant diseases within high tunnels. The article mentions powdery mildew, early and late blights, cucumber mosaic and spotted wilt viruses.
Useful websites for all students:

Peer review in 5 minutes: A short animation focused on the importance of peer-review in research.
http://www.lib.ncsu.edu/tutorials/pr/

Anatomy of a Scholarly Article: Interactive web guide highlighting the key identifying features of scholarly articles.
http://www.lib.ncsu.edu/tutorials/scholarly-articles/

Basic Searching by EBSCOhost: 4 minute video on Basic Searching by EBSCOhost with questions to ensure you understand the database search system.
http://support.ebscohost.com/training/flash_videos/EBSCO_Basic_Quiz/EBSCO_Basic_Quiz.htm

Article Databases in 5 Minutes Focus: "What is a database?" "What is an article database?" and "What are the key features of article databases?"
http://www.lib.ncsu.edu/tutorials/article-databases/

Reading scientific articles: also includes short sections on WHY? and the anatomy of scientific articles
http://www.lib.purdue.edu/phys/assets/SciPaperTutorial.swf

How to read a scientific research paper: How to Read a Scientific Research Paper-- a four-step guide for students and for faculty Ann McNeal, School of Natural Science, Hampshire College, Amherst MA 01002
http://hampshire.edu/~apmNS/design/RESOURCES/HOW_READ.html

Citation Styles (2 tutorials - APA and MLA styles): (2 tutorials - APA and MLA styles) Drag and drop different parts of the citations into the proper order & also check your work. NOTE: You only need to view the APA format style examples!
http://support.library.ewu.edu/reference/tutorial/flash/citation.html

Another APA formatting and style guide
http://owl.english.purdue.edu/owl/resource/560/01/

Paraphrasing What it means and how to do it
http://owl.english.purdue.edu/owl/printable/563/

Texas Tech Writing Center can upload written work online and receive feedback. You can also physically visit them if you are on campus
http://english.ttu.edu/uwc01/

7 Tutorials for Biology Students Searching the Scientific Literature by Purdue University
http://www.bio.purdue.edu/bootcamp/library_tutorials/

Science Information Tutorial University of California – Irvine
http://www.lib.uci.edu/services/tutorials/science_info_tutorial/tutorial.html
APPENDIX K

RECRUITING PLAN FOR THE ACADEMIC YEAR 2014-2015

1. Overall departmental notes and vision on graduate programs

a. Recruitment plans are developed as a direct result of department initiatives as outlined in the Strategic Plan (2011-2015). Those line item initiatives are listed below with expansion on subsequent points. A complete Strategic Plan can be found on our departmental website: http://www.pssc.ttu.edu/strategicplan/PSSStrategicPlan.pdf

b. The vision statement of the department addresses specific recruitment and graduate program missions.
   i. “The Department of Plant and Soil Science will be recognized as one of the top 20 academic Plant and Soil Science departments in the nation. The Department’s reputation and integrity will be based on excellence in teaching, research and engagement regarding current and emerging aspects of plant and soil sciences.”
   ii. Proper recruitment will enhance the overall mission and vision of the department by recruiting, enrolling, and retaining high-level graduate students.

   i. Successful recruitment will meet and exceed this outcome of the Strategic Plan.
   ii. Of the 25 Assessment Methods for this Outcome, 5 are specific to graduate programs and will assist in guiding recruitment plans.
      2. 100 students enrolled in courses at distance per year (undergraduate & graduate). We currently have 57 distance students (37 undergraduate students and 16 graduate students)
      3. Offer 2 graduate degree programs and three graduate certificates through distance learning. (Master of Science in plant and soil science, Master of Science in horticulture science, and graduate certificates in crop protection, fibers & biopolymers, horticultural landscape management, and soil management).
      5. Offer 4 certificate programs for professional development and continuing education. We currently have graduate certificates in: crop protection, fibers & biopolymers, horticultural landscape management, and soil management)
   iii. Admission and recruiting goals for departmental standards in graduate students.
      1. Mean GRE score of 300 for entering Masters students.
      2. Mean GRE score of 300 entering Ph.D. students.
   iv. Objective 1.1 Increase student numbers and diversity.
   v. Objective 1.4 Increase distance learning opportunities.
   vi. Objective 1.5: Provide undergraduate, graduate, and professional curricula and programs that enhance disciplinary knowledge and analytical, creative thinking, and leadership skills.
vii. Objective 1.7: Increase the number of high-quality graduate students.

d. Outcome 2: Enhance Academic Quality and Reputation
   i. Objective 2.2: Increase national recognition of faculty and students
   ii. Objectives 2.3: Increase the number and effectiveness of formal exchange programs with international institutions

e. Outcome 3: Expand and Enhance Research and Creative Scholarship
   i. Objective 3.4: Increase research funding
   ii. Objective 3.5: Construct, renovate, and modernize research facilities

f. Outcome 4: Strengthen Outreach, Engagement, and Pride in PSS
   i. Objective 4.1: Strengthen partnerships and collaborations with all groups involved in education and research in agriculture and natural resources.
   ii. Objective 4.2: Strengthen and initiate partnerships and cooperation within the Texas Tech University System and with other institutions.
   iii. Objective 4.3: Enhance public awareness of PSS
   iv. Objective 4.4: Inform alumni of PSS accomplishments and encourage them to be ambassadors for PSS.

g. Outcome 5: Attain Resource Sufficiency and Efficiency and Ensure Accountability
   i. Objective 5.2: Raise more money for scholarship endowments


a. Increase awareness of PSS and graduate programs with specific events and groups.
   i. Expo Fair/Vendor Booths
      1. Attend American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America and have an expo booth displaying graduate programs.
      2. Attend State and National FFA Conventions and display graduate program information in booths.
      3. Attend State 4-H Round-Up and display graduate information in booth.
      4. Attend Texas Nursery and Landscape Association Expo and have graduate information in booth.
      5. Attend the Texas Tech Undergraduate Research Conference Graduate School Expo and have a booth displaying graduate programs.
      6. Attend Texas Cotton Ginners Trade Show and have a booth to display graduate programs.
      7. Attend Native Plant Society of Texas and have a booth to display graduate programs.
      8. Attend various Garden Club conventions, Nursery Associations, and conventions to have an expo booth to display graduate programs.
      9. Work with faculty to see what organizations they hold membership in and what expo shows are available for those organizations.
     10. Attend other university graduate expo and career day events to display graduate program information.
     11. Ask interested students to fill out an information card with contact information so we can follow up with them after the event and create a database of potential applicants.
   ii. Communication to organization members/targeted groups.
1. Advertise graduate programs to county extension agents. (Texas AgriLife Extension Services, Research Services)
2. Advertise graduate programs in materials for all organizations that we attend expo shows (TNLA, ASA/CSSA/SSSA, FFA, 4-H, Texas Cotton Ginner, Texas Cotton Association, Native Plant Society, etc.).
4. Advertise to agricultural educators that teach in plant science, agronomy, or horticulture intensive programs about our graduate programs.
5. Advertise graduate programs to active or retired military groups.
6. Advertise graduate programs to plant science related small business owners.

iii. Collaboration and additional communication
1. Maintain AG IDEA program and advertise courses and graduate programs on all AG IDEA platforms.
2. Purchase ad space on Gradschools.com to advertise graduate programs.
3. Present to 4-year universities with plant science undergraduate degrees that do not offer graduate programs. Specifically target senior seminar, capstone, or research intensive courses.
4. Offer graduate course credit at the Texas International Cotton School. Highlight department research, faculty, and those department graduate students that are participating.

b. Create overall departmental recognition.
   i. Encourage faculty and current graduate students to apply for awards, grants, and travel to conferences to represent the department.
   ii. Support awards or contests at various conventions. Sponsor the award or luncheon to create name recognition.
   iii. Host national and regional contests (soil judging, plant identification, quiz bowl, etc.) for college students to introduce department and graduate programs.
   iv. Encourage faculty international trips to promote research, recruiting, and the department and continue current relationships.

1. Current relationships and activities include:
   a. IMAm in Brazil- cotton fibers
   b. CSIRO Materials Science and Engineering – cotton fibers
   c. Faser Institute in Germany- cotton fibers
   d. Kenya Agricultural and Research Institute (KARI), Kenyatta University, and Share International in Lodwar, Kenya- food security
   e. Babeș-Bolyai University, Cluj-Napoca, Romania- soil spatial variability, proximal, and remote sensing.
   f. Universitatea de Științe Agricole și Medicină Veterinară, Cluj-Napoca, Romania- pedology
   g. Institute of Soil Sciences – Chinese Academy of Sciences, Nanjing- pedology, soil carbon dynamics
   h. Consejo Superior de Investigaciones Científicas, Zaragoza, Spain- soil science
   i. Università Politecnica delle Marche, Ancona, Italy- pedology, partners in student exchange.
   j. Ramakrishna Mission Vivekananda University, Kolkata, India- soil science

Plant and Soil Sciences
v. Encourage faculty research presentation at regional and national conferences to aid in department and graduate program recognition.

vi. Partner in industry research field days, conferences, trials, and meetings.

c. Current student retention efforts
   i. Support and enhance programs of the Plant and Soil Science Graduate Student Council.
      1. Invite speakers to come present on campus.
      2. Support various research presentations. Sponsor those awards.

3. Department communication and marketing to aid in graduate recruitment.
   a. Maintain an accurate and visually appealing website.
      i. Easy to identify desired links.
      ii. Information is clear and concise.
      iii. Automatically generated contact us form for inquiries.
      iv. Keep information updated as soon as the update is available.
      v. Highlight faculty and research facilities so prospective students are able to see what we offer.
   
b. Create and distribute a quarterly department newsletter.
      i. Highlight student, faculty, and staff points. Includes major events and trips that are happening.
      ii. Develop personal interest in department.
      iii. Distribute to faculty, staff, students, alumni, and advisory board. Printed copies are displayed in department front office.
   
c. Create, display, and maintain a graduate program promotional brochure
      i. Brochure is updated as soon as possible when changes are made.
      ii. Highlights degree programs, application process, and contact information for inquiries.
      iii. Available to be mailed, handed out, emailed, or be on display for any and all events as requested.

4. New wing addition to Plant Science Building on Campus
   a. Bayer CropScience has strong a relationship with PSS culminating with the donation of $19.3 million to the department, $13.6 specifically for an expansion and renovation for the new Bayer Plant Science Building.
   b. Upgrades and renovation will take place throughout the existing building, with new labs, classrooms, and offices being created in the new addition.
   c. Project adds 21,122 square feet of new construction and 2,440 square feet of renovation.
   d. Building scheduled to be complete for grand opening in summer 2015.

5. Cultivate new industry partnerships and continue current industry partnerships.
   a. Current industry partners
      i. Bayer CropScience
      ii. Monsanto
      iii. Dow
      iv. Cotton Incorporated
v. Turner Seed Company  
vi. BASF  
vii. Chromatin  
viii. SESACO  
ix. Agrium Advanced Technologies  
x. Syngenta  
xi. Aquatrols  
 xii. Cheminova  
 xiii. H&W Genetx  
xiv. Plains Cotton Growers  
xv. Texas Wine and Grape Growers Association  
xvi. Texas Association of Nursery Managers  
xvii. Texas Seed Trade Association  

6. **Cultivate new institution partnerships and continue current institution partnerships.**

We will continue to develop contacts with the major agribusinesses in Texas, the U.S.A, and the World. It is extremely important to develop a curriculum that fits the industry needs.
APPENDIX L

PSS ADVISORY COMMITTEES

The three PSS Advisory Committees will each consist of four individuals carefully selected to provide input, advice, and advocate for the department of Plant and Soil Science. The three committees will meet jointly with PSS Faculty and/or staff, PSS Chair, and other TTU personal during an annual meeting. The PSS Advisory Committees will provide recommendations to the department on research, outreach, and educational activities and mission, key benchmarks, future focus and planning. They will be asked to advocate for the department to aid in strengthen its endowment, grantsmanship, technical and educational proficiency. Advisory Committee positions are for two years, but recurrent terms are possible, subject to reconfirmation by the PSS Chair. Terms will begin in October and end following the second year of service. Any Advisory Committee Member missing two consecutive meeting may be asked to resign and will be replaced.

- The Commodity Advisory Committee will provide input from the production, processing, marketing, and manufacturing sectors key to West Texas Agriculture (Cotton, Sorghum, Peanut, Corn, Forage, and Horticulture). This committee will help ensure that research and outreach objectives will have an impact on the commercial production and utilization of West Texas and U.S. agriculture. Members of this committee will be selected from regional and/or national commodity organizations.

- The Education and Outreach Advisory Committee will evaluate and provide advice to help ensure the department’s teaching and outreach merit is effective, proficient, and adapting to a changing environment. Members of this committee will be selected from education, extension, and end-users.

- The Industry Advisory Committee will critically evaluate the commercial and industrial impact of research activities. They have extensive experience in developing research and breeding priorities for West Texas agriculture and will help ensure PSS research activities are current and state of the art. Members of this committee will be selected from for profit companies.

BOARD MEMBERS

Commodity:
Justin Weinheimer (United Sorghum Checkoff Program)
Shawn Wade (Plains Cotton Growers)
Shelly Nut (Texas Peanut Producers Board)
Amy Graham (Texas Nursery and Landscape Association)
Industry:
David Becker (Bayer)
Eric Best (Monsanto)
Larry Lambright (Chromatin)
Doug Smellage (Lawns of Dallas)

Education and Outreach:
Jaroy Moore (Texas A&M AgriLife)
John Burke (USDA-ARS)
Chace Hill (grape producer)
Dale Swinburn (cotton producer and more)
College:
Agricultural Sciences and Natural Resources

Department:
Plant and Soil Science

Conducted by:
Institutional Research & Information Management

December 2015

FACULTY SURVEY RESULTS –
Number of faculty participated in survey

<table>
<thead>
<tr>
<th>Rank</th>
<th>Number</th>
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<tbody>
<tr>
<td>Professor</td>
<td>8</td>
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<tr>
<td>Assoc. Professor</td>
<td>6</td>
</tr>
<tr>
<td>Asst. Professor</td>
<td>7</td>
</tr>
<tr>
<td>Emeritus</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td>PARTICIPANT TOTAL</td>
<td>22</td>
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</table>
## SCALE

<table>
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<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>-</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q-1</strong> The facilities and equipment available to teach graduate courses are adequate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td><strong>4.09</strong></td>
</tr>
<tr>
<td><strong>Q-2</strong> I have adequate access to facilities and equipment needed for my graduate work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>10</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td><strong>3.62</strong></td>
</tr>
<tr>
<td><strong>Q-3</strong> The quality and availability of departmental graduate student office space is adequate for my needs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td><strong>4.41</strong></td>
</tr>
<tr>
<td><strong>Q-4</strong> Library resources available to me are adequate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>10</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td><strong>3.95</strong></td>
</tr>
<tr>
<td><strong>Q-5</strong> Teaching resources (faculty, teaching assistants) are adequate to my needs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>11</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td><strong>4.14</strong></td>
</tr>
<tr>
<td><strong>Q-6</strong> The program offers an adequate selection of graduate courses, sufficient for timely completion of a full graduate program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>14</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td><strong>3.82</strong></td>
</tr>
<tr>
<td><strong>Q-7</strong> The graduate courses available are taught at an appropriate level and are of sufficient rigor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td><strong>3.90</strong></td>
</tr>
<tr>
<td><strong>Q-8</strong> The graduate teaching by faculty in the program is of appropriate quality.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>13</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td><strong>4.14</strong></td>
</tr>
<tr>
<td><strong>Q-9</strong> Graduate courses in other fields, needed to support your program or minor, are sufficiently available.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>11</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td><strong>3.81</strong></td>
</tr>
<tr>
<td><strong>Q-10</strong> There is adequate communication about policy and program changes in your department.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td><strong>3.53</strong></td>
</tr>
<tr>
<td><strong>Q-11</strong> There is adequate communication from the upper administration regarding policy changes.</td>
<td></td>
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<td></td>
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<td></td>
<td>8</td>
<td>10</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td><strong>4.24</strong></td>
</tr>
<tr>
<td><strong>Q-12</strong> I am satisfied with the professional interaction with faculty throughout TTU.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td><strong>4.32</strong></td>
</tr>
<tr>
<td><strong>Q-13</strong> Graduate courses in other fields, needed to support your program(s) or minors, are sufficiently accepted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td><strong>4.32</strong></td>
</tr>
</tbody>
</table>
Q-14 Graduate courses in other fields, needed to support your program(s) or minors, are sufficiently recommended by your advisor(s).

| 8 | 8 | 4 | 1 | 1 | 0 | 3.95 |

Q-15 I am receiving the research and professional development guidance I need from other faculty.

| 8 | 9 | 3 | 1 | 1 | 0 | 4.00 |

Q-16 I am satisfied with the professional interaction with the graduate program coordinator(s).

| 3 | 4 | 4 | 6 | 5 | 0 | 2.73 |

Q-17 I am satisfied with the professional interaction with other faculty within the program(s).

| 7 | 9 | 3 | 1 | 1 | 1 | 3.95 |

Q-18 I am treated as a respected contributor to the graduate program in which I am involved.

| 5 | 8 | 3 | 2 | 2 | 2 | 3.60 |

Q-19 I have been given an opportunity to be engaged in decisions regarding changes in the program(s).

| 9 | 7 | 6 | 0 | 0 | 0 | 4.14 |

Q-20 Course and program changes are evaluated by all faculty and voted upon by those faculty.

| 7 | 7 | 7 | 1 | 0 | 0 | 3.91 |

**FACULTY COMMENTS:**

What do you consider to be the strengths of your graduate program(s)?

- Student involvement in research.
- Excellent research facilities and support staff.
- Our new graduate offices and lab facilities are excellent for the graduate students. We have a strong faculty who is committed to graduate education and care about their students.
- The close interaction of faculty with graduate students (e.g., one on one training in the field, lab, etc.). I have seen an evolution at TTU whereby research is now greatly valued and publication by graduate students is strongly encouraged. These will help us attain AAU-like status.
- Texas Tech University has an excellent reputation for training excellent Research and Teaching Plant Scientist that are employed by private industry, government agencies, and sister universities. Our students have the opportunity to tailor their educational program and interact with a strong cadre of professionals in this area. Consequently, both the M.S. and Ph. D. programs in Plant and Soil Science are both nationally and globally competitive.
<table>
<thead>
<tr>
<th>Diversity of faculty expertise and high quality of faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many assistantships from faculty grants are available. /</td>
</tr>
<tr>
<td>Strong research programs. / Research intensive department.</td>
</tr>
<tr>
<td>Job placement - my graduate students have all been successful</td>
</tr>
<tr>
<td>in finding full-time employment by the time they finished their</td>
</tr>
<tr>
<td>degrees.</td>
</tr>
<tr>
<td>The breadth of subject material students are exposed to.</td>
</tr>
<tr>
<td>diverse faculty</td>
</tr>
<tr>
<td>The diverse expertise of our faculty and everyone's willingness</td>
</tr>
<tr>
<td>to collaborate is the biggest strength of our graduate program.</td>
</tr>
<tr>
<td>This may be the sharing of knowledge in different subject areas</td>
</tr>
<tr>
<td>or instrumentation required to complete a research project. It</td>
</tr>
<tr>
<td>is much easier and economically feasible to complete research</td>
</tr>
<tr>
<td>when colleagues are open to you working with their equipment</td>
</tr>
<tr>
<td>as opposed to us all having to purchase our own pieces when</td>
</tr>
<tr>
<td>they are already present.</td>
</tr>
<tr>
<td>Flexibility allowed to faculty in selecting graduate students</td>
</tr>
<tr>
<td>Breath of experience my students receive. Good funding. Good</td>
</tr>
<tr>
<td>scholarship opportunities. Good space and facilities. Excellent</td>
</tr>
<tr>
<td>exposure to other faculty and programs. Much of this is due to</td>
</tr>
<tr>
<td>split appointment opportunities with other agencies (Texas A&amp;M</td>
</tr>
<tr>
<td>AgriLife Research and Extension)</td>
</tr>
<tr>
<td>Research opportunities and a high employment rate of graduates.</td>
</tr>
<tr>
<td>We have excellent research facilities, a Graduate Faculty that</td>
</tr>
<tr>
<td>is extremely knowledgeable and understanding and the strong</td>
</tr>
<tr>
<td>backing of our industry.</td>
</tr>
<tr>
<td>A student-focused, research-intense, diverse, multidisciplinary</td>
</tr>
<tr>
<td>department, which offers coursework and academic programs in a</td>
</tr>
<tr>
<td>broad spectrum of the plant and soil sciences. In addition to</td>
</tr>
<tr>
<td>excellent research and lab facilities, it offers courses</td>
</tr>
<tr>
<td>specifically meant for research as well as many opportunities</td>
</tr>
<tr>
<td>for students to be involved in research. It offers opportunities</td>
</tr>
<tr>
<td>for student’s scholarships, internships, assistantships,</td>
</tr>
<tr>
<td>fellowships, and other student financial aid. Nationally and</td>
</tr>
<tr>
<td>internationally renowned faculty members and staffs are</td>
</tr>
<tr>
<td>dedicated to excellence in research, teaching and engagement</td>
</tr>
<tr>
<td>regarding current and emerging aspects of plant and soil</td>
</tr>
<tr>
<td>sciences. Faculty members are actively engaged in interdisciplinary</td>
</tr>
<tr>
<td>collaborations with various other national and international</td>
</tr>
<tr>
<td>departments/universities. It is strongly allied with state and</td>
</tr>
<tr>
<td>federal agencies, local cooperatives, private industry,</td>
</tr>
<tr>
<td>professional societies, and so forth, which enhance teaching,</td>
</tr>
<tr>
<td>research as well as students’ career goals.</td>
</tr>
<tr>
<td>Quality of faculty is very strong and student-faculty interaction</td>
</tr>
<tr>
<td>are consistently very positive.</td>
</tr>
<tr>
<td>Faculty expertise.</td>
</tr>
<tr>
<td>funding is available for many students</td>
</tr>
<tr>
<td>NA</td>
</tr>
<tr>
<td>All the students are financially supported. Students find</td>
</tr>
<tr>
<td>positions immediately after graduation.</td>
</tr>
<tr>
<td>Ability to gain</td>
</tr>
</tbody>
</table>
What changes, if any, could be made to improve the quality of your graduate program(s)?

<table>
<thead>
<tr>
<th>Improve undergraduate student involvement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
</tbody>
</table>

I would like to have another position or two in one of the disciplines at the graduate level. However, with the broad area covered by the plant and soil sciences, it is difficult to maintain a balance with all of the different crops/disciplines.

We need more graduate research assistantships. We need to make it easier for graduate students to join on at TTU. For instance, a recent graduate student started on August 1st, but didn't get his first paycheck until October 1st. In the meantime, he was forced to pay his first tuition payment - the result was that I had to personally loan him $800. We must change that. / / We need to be thinking of education as a 12 month endeavor. In our discipline, summer is when we get to the MOST research, data collection, work with students, etc. Yet many of our faculty are 9 month. This limits what we can do. / / Candidly, I would like to see online graduate programs de-emphasized. In my mind, they DO NOT constitute equal rigor to traditional programs. I think we are selling ourself short. These students typically do not generate peer reviewed publications, they are not on the cutting edges of advancing science - so what do we want to do? Advance as a research institution or teaching institution? We must decide.

More graduate assistantships with a competitive stipends. Historically, there has been a shortage of both laboratory space and field equipment.

More course offerings

To keep growing we need more assistantships. We are at a ceiling in terms of grants. Therefore, more institutional assistantships (research and teaching) are needed or additional faculty lines. Lab space is limited therefore further growth could be an issue.

none

Have broader opportunities for teaching assistants.

More teaching assistantships to attract the best students to fill these roles

Although the University, College, and Department are very supportive of our graduate students in a number of ways, there are disciplines that are not as fully funded externally due to the subject area that is being studied and researched. Those people working in those areas may not be as capable of obtaining large grants to cover the financial costs of a graduate student. If more funds and assistance could be provided from those areas to be incorporated with the funding received by those parties, it would possible for the graduate student numbers to be increased.

A greater number of TAs and RAs (selected by using high academic standards) allocated to faculty equitably. There need to be standard expectations from graduate students in the department.

NA

PSS lacks the faculty FTE to offer the selection and quality of coursework available at better universities. Our research opportunities are equivalent but we fail to offer an elite standard of courses. This is somewhat due to the courses being offered but mostly due to a small faculty in comparison to
better universities. We just cannot offer the same standard of education ------ and the better student know this and choose other universities to continue their education.

| Have all faculty that are qualified teach a graduate class ....this will increase class options and create a more diverse opportunity. Having incredible researchers that are not willing to share knowledge or experience goes against everything a university should stand for. |
| It needs more faculty to support the program and to offer more courses and make our graduate students more competitive. It needs to increase lab facilities and resources for research and research training. It needs to increase financial aids for students, including teaching assistantships. Quality of teaching should be monitored or evaluated regularly. |
| More stipends allocated to both RAs and TAs. |
| Additional office space for graduate students. Fewer "piggy-back" (dual numbered) graduate courses. |
| additional courses in our discipline |
| NA |
| Departmental fellowships to graduate students. Increasing number of TAs. |

**Please feel free to add any additional comments or questions in the space below.**

| Dr. (redacted) is an excellent chair and is moving the department forward, especially in graduate teaching and research. |
| TTU graduate programs are solid, but we need better coordination and cooperation with the graduate school. |
| The Graduate Program Plant Science at TTU has the potential to become a Nationally and Globally recognized area of excellence with a relatively modest investment by Higher Administration and the State of Texas. |
| none |
| Not applicable |
### STUDENT SURVEY RESULTS –

**Number of students participating in survey:**

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral</td>
<td>28</td>
</tr>
<tr>
<td>Master’s Thesis</td>
<td>16</td>
</tr>
<tr>
<td>Master’s Non-Thesis</td>
<td>2</td>
</tr>
<tr>
<td>Master’s Non-Thesis (online program)</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
<tr>
<td><strong>PARTICIPANT TOTAL</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; year</td>
<td>17</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; year</td>
<td>17</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; year</td>
<td>10</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; year</td>
<td>3</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; year</td>
<td>0</td>
</tr>
<tr>
<td>6&lt;sup&gt;th&lt;/sup&gt; year</td>
<td>0</td>
</tr>
</tbody>
</table>

### SCALE

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
<td>N/A</td>
<td>Average</td>
</tr>
<tr>
<td>Q-1 The research facilities and equipment available for my graduate research meet my needs.</td>
<td>21</td>
<td>19</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Q-2 I have adequate access to facilities and equipment needed for my graduate work.</td>
<td>21</td>
<td>20</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Q-3 The quality and availability of departmental graduate student office space is adequate for my needs.</td>
<td>17</td>
<td>17</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Q-4 Library resources available to me are adequate for my needs.</td>
<td>25</td>
<td>16</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Q-5 Teaching resources (faculty, teaching assistants) are adequate to my needs.</td>
<td>25</td>
<td>14</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Q-6 The program offers an adequate selection of graduate courses, sufficient for timely completion of a full graduate program.</td>
<td>17</td>
<td>16</td>
<td>4</td>
<td>9</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Q-7 The graduate courses available are taught at an appropriate level and are of sufficient rigor.</td>
<td>15</td>
<td>24</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Q-8 The graduate teaching by faculty in the program is of appropriate quality.</td>
<td>19</td>
<td>25</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Q-9 Graduate courses in other fields, needed to support my program or minor, are sufficiently available.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>13</td>
<td>17</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>6</td>
<td>3.90</td>
</tr>
</tbody>
</table>

| Q-10 Program seminars are adequate to keep me informed of developments in my field. |
|---|---|---|---|---|---|---|
| 17 | 16 | 8 | 3 | 2 | 1 | 3.93 |

| Q-11 The initial advising I received when I entered the program was an adequate orientation. |
|---|---|---|---|---|---|---|
| 18 | 20 | 3 | 4 | 2 | 0 | 4.02 |

| Q-12 I have a department mailbox or other form of communication with faculty & graduate students. |
|---|---|---|---|---|---|---|
| 19 | 15 | 4 | 2 | 1 | 6 | 4.20 |

| Q-13 I have adequate access to my major professor. |
|---|---|---|---|---|---|---|
| 33 | 11 | 2 | 0 | 1 | 0 | 4.60 |

| Q-14 I am receiving the research and professional development guidance I need. |
|---|---|---|---|---|---|---|
| 24 | 15 | 4 | 1 | 2 | 1 | 4.26 |

| Q-15 I am satisfied with the professional interaction with my major professor. |
|---|---|---|---|---|---|---|
| 27 | 13 | 3 | 1 | 3 | 0 | 4.28 |

| Q-16 I am satisfied with the professional interaction with faculty both within the program and at TTU. |
|---|---|---|---|---|---|---|
| 21 | 20 | 2 | 1 | 2 | 1 | 4.24 |

| Q-17 I am treated as a respected contributor to the research program in which I am involved. |
|---|---|---|---|---|---|---|
| 22 | 16 | 4 | 0 | 2 | 3 | 4.27 |

| Q-18 I have been given an opportunity to be engaged in significant research for my thesis or dissertation. |
|---|---|---|---|---|---|---|
| 24 | 16 | 2 | 0 | 2 | 3 | 4.36 |

| Q-19 If I decide to change my major professor, the mechanism for doing so is suitable. |
|---|---|---|---|---|---|---|
| 4 | 7 | 11 | 0 | 2 | 24 | 3.46 |

| Q-20 I am informed of opportunities for professional development and contacts outside TTU, such as attendance at professional meetings. |
|---|---|---|---|---|---|---|
| 18 | 21 | 5 | 2 | 1 | 0 | 4.13 |

| Q-21 Graduate teaching or research assistantship stipends are adequate. |
|---|---|---|---|---|---|---|
| 9 | 16 | 3 | 7 | 3 | 9 | 3.55 |

| Q-22 The program offers adequate opportunity for its graduate students to gain teaching experience. |
|---|---|---|---|---|---|---|
| 10 | 13 | 7 | 4 | 0 | 14 | 3.85 |

| Q-23 Graduate teaching assistantships, assignments are made equitably, based on established criteria. |
|---|---|---|---|---|---|---|
| 10 | 14 | 10 | 0 | 1 | 13 | 3.91 |
**Q-24** Program policies are clearly defined and readily available to me.

|   | 19 | 23 | 3 | 1 | 1 | 0 | **4.23** |

**Q-25** Graduate program policies clearly identify petition and appeals procedures available to me.

|   | 12 | 20 | 8 | 1 | 1 | 5 | **3.98** |

**Q-26** There is a well-established mechanism for regular graduate student participation in decisions affecting students, whenever this is appropriate.

|   | 7 | 22 | 7 | 2 | 2 | 7 | **3.75** |

**STUDENT COMMENTS:**

What do you consider to be the strengths of this program?

- The co-ordination of administration, faculty and students
- Some of the instructors and classes are up to date with current technology and current affairs.
- Advising is excellent. Knowing the steps to graduate is outlined clearly. Professors want you to learn not just spit out information.
- I have not been in long enough to give an adequate answer.
- Quality standards for research and academics are outstanding.
- Excellent faculty, resources, and research.
- Most of the faculty are really helpful and professional. I enjoy interactions with the majority of the faculty, and all of the students in the PSS department.
- Outside funding for research and facilities.
- well equipped lab / supportive faculty / excellent learning and research environment. /
- Good training / Industry and research oriented / Good facilities in the field / /
- molecular genetics is good
- The equipped labs
- Available teaching materials and quality of instructions
- The motivated and dedicated faculty!. Secondly the amazing administration in PSS from recruitment, the chair, are all supportive and flat out get things done.
- I have all the information, devices, and money to do my research
- For my interests I feel very well suited with the department. In my current role within industry I am fortunate enough to be able to communicate with the weed scientist as well as our physiologists.
### Adequate and resourceful instructional staff.

**Seminars**

This program has strong faculty with a wealth of knowledge. This allows for a broad array of courses to choose from. I was able to select courses that are relevant to my research and that gave me a much better understanding of the background and principles I needed to be successful. In addition, allowing distance courses made my studies much easier.

**Professor formation, facilities, integration and working environmental of the team.**

Not applicable

Well mechanised system and guidance makes the department more effective.

My major advisor is the biggest strength of my program. She provided me with everything possible for successful completion of my program. In addition, other faculty and staff of plant and soil science department are biggest assets of department, always readily available to help students in all possible ways.

**Advisor, strong link to industry in Lubbock**

I consider the lab to be the strength. As I have knowledge of field work already.

- Its the diverse program and we have opportunity to focus on the concentration base on the need and the interest

- Quality of major professor and committee. Ability of incorporate a real-life project (joint research with a private company)

**I would like to thank you for providing us a well-organized graduate program.**

Where I currently do my research work, Texas A.M agrilife research is a very good place for a student like me to conduct real world experiments. Lucky to be working on a crop which is grown in my country, Ghana and will return to just continue what I am studying on.

**The faculty and staff.**

**Professional instructors friendly staffs that care about student's current and future**

**freedom to take courses from diverse departments**

---

**What do you consider to be the weaknesses of this program?**

I don't feel there is a lot of hands on course work. Lecturing about the information is great, but if we don't know how to apply it and utilize it, it will make things more challenging when we get our first jobs. //
| The less interaction with other international students and friends and busy schedule of professors to meet in person |
| Some of the classes and instructors are still using recycled power points from 10 years ago and give the impression that they teach distance courses because they don't want to be bothered with actually having to deal with students. |
| Wider range of classes in PSS relating more to the molecular aspects of plant biology. |
| I have not been in long enough to give weaknesses of the program. |
| Lack of courses available for students with undergraduate degrees from the department. Professor turnover is potentially out of hand. |
| Opportunities for graduate students to participate in teaching. |
| I wish the graduate course selection was more diverse. I feel a little bit like the black sheep because I don't study agriculture, however I enjoy all the classes I have taken that have agricultural elements (e.g. plant pathology was wonderful, and I am really enjoying PSS seminar). I would really love if Dr. Longing was able to teach a graduate level entomology class for example. |
| Some faculty not believing in students therefore not giving opportunities to ones who want it. |
| I don't observe any weaknesses in this program |
| Lack of interdisciplinary research / Lack of minor departmental subject courses |
| Sometimes we don't have enough equipments |
| The lack of respect to the graduate student who is under a new hired (weak) faculty member. Involving the graduate student with the bad personal relationships between some faculty members. Provide advises to the graduate student based on the personal interest and revenge between some faculty members and not based on what is best for the development of the graduate student nor the program in general. This program is not interested in making a graduate student a professional researcher. Some faculty members seek "dirty" unfair competition instead of professional productive competition that is based on hard work and respect. Some faculty members, who are unfortunately decision makers in the department and the college in general, care about quantity rather than quality. Abusing the graduate student by some faculty members, especially the internationals who have no other options, and making them work without any respect or appreciation. This is not how scientists and real researcher should be. |
| Too much theoretical oriented courses |
| In contrast with many face to face programs, online PhD opportunities are relatively new...so there is a learning curve at this point. I think it is only a matter of time before, online PhD programs will be in the fold and fully functional. |
| It is too early to have found any weaknesses. |
| Class scheduling |
| Need to offer more major/minor options |
I think the program would benefit from more standardized formats for distance courses. Each professor taught the distance sections differently, which were not necessarily bad, but having a similar format for all courses would be beneficial.

There are some bureaucratic issues that slow down the research pace, but that are not a full obstacle.

Not applicable

Not at all.

Limited to technological advancements / (both wet lab and dry lab) in the field of my research. Limited advanced level courses in the department especially in statistics.

Entities separating graduate students, lack of courses offered

Although program is diverse, there are not much coursework and/or faculties are available in certain concentration. For example, I am concentrated in fiber and bio-polymer research, however, there are limited faculty on this area and there are not much coursework related to this concentration are available which suit my need are available in the department. So, I have to take courses in the department which are sometimes not relevant to my research or take courses from other department which are too hard for me because those courses in other department are designed to meet the requirement in their department to full the coursework criteria for the degree.

None

My lab is not located in the main campus. Therefore, we cannot come to most of the events organized by TTU, and also we cannot access most of the facilities provided for us. Driving, parking in the commuter parking lot and, taking a bus to the main campus take approximately 45 minutes. Altogether, it takes nearly 1.5 hours for one trip. We are not allowed to use the paid parking lots even we are willing to pay an additional amount for parking. We cannot manage time for those events with our regular lab works and lectures. So we keep on missing most of the important events, because we must come to the regular lectures. This is the main concern for me right now. /  

The major weakness in my program is the means of transportation. Example where I need to travel to nearby research institute where my advisor's laboratory is well stationed. Buses don't go that way and this makes research life difficult for me. Have to rely on friends going that way and some workers / considering the fact that I am not allowed to drive under the sponsorship I am currently on. My advisors engineered these transport arrangements, but still think there are some setbacks in these arrangement.

nothing much in the department

lack of seminar series from professors around USA and journal clubs between students
What changes, if any, could be made to improve the quality of this program?

Also, there is an imbalance in where the attention goes for programs, awards, praise, etc for accomplishments within the college. I understand that the college is mostly agriculture/cotton, but everyone seems to forget that we also have horticulture, soils, entomology, natural resource management etc. that make big contributions to the college. / / Lastly, there is a huge lack of racial diversity in the college overall that I wish would be improved.

<p>| Friendly atmospheric environment for international students and conducting more career fair programs. |
| I would include more selection in graduate courses. |
| Diversify teaching subjects |
| To de determined as I progress in my degree program. |
| Obtain and retain more high quality faculty. |
| Increased amount of teaching opportunities. |
| Sometimes, the graduate student dynamic is not well understood. What I mean to say is that communications between faculty and students are sometimes needlessly stressful and cloudy. I think it would be nice if graduate students were more connected to each other and to other faculty then just the advisor. This way, ideals and opinions could be more rounded and solutions may be easier to reach. |
| A clear guideline for being accepted and not just one persons opinion. |
| no need of change |
| Encourage more interdisciplinary research especially molecular genomics and agronomy / Including more courses in the department such as Experimental design, population genetics, good plant physiology course |
| so far so good |
| Put the program under the microscope, observe how some advisers treat their graduate students, especially the internationals, and talk to the graduate students individually and assure them that there will be no harm if they speak up and talk about any kind of abuse or harm they are suffering from. |
| If we give more attention to practical oriented courses, access to recorded courses, it may improve the current program. Limited number of courses must be enough for PhD study. PhD students should focus on research only. But I feel it is not here around. |
| none |
| Up to now, none. |
| courses offer every year will help student finish earlier |</p>
<table>
<thead>
<tr>
<th>I do not have any suggestions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t have yet any suggestion to improve the quality of the graduate program</td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
<tr>
<td>Not yet.</td>
</tr>
<tr>
<td>Having advanced statistics and bioinformatics courses in department or even in other departments of the university would have helped more.</td>
</tr>
<tr>
<td>More faculty and the coursework according to the concentration.</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Buses should be made available to where some of our professors work such as AgriLife research. At least a bus should go there in the morning and also in the evening. So that students who don't have cars can board. / I must mention that arrangements have been made to convey me to the research institute to and from, but I think buses going there that way to and from one in the morning and one in the evening would be the best and will not deter new students from coming. / / Another alternative is to have a similar laboratory here on campus so that some of the work could be done here. Making it possible for students to even work in the night if they so wish to, in order to meet deadlines.</td>
</tr>
<tr>
<td>I like small classes in grad school, please don't expend the program into a huge size one.</td>
</tr>
<tr>
<td>more seminar series from different professors and more interaction with grad students</td>
</tr>
</tbody>
</table>

Please feel free to add any additional comments below.

| I would like to take this survey again when I have been in longer. |
| Start bus service from the school to FBRI. |
| This program lacks the respect to the graduate student who is under a new hired (weak) faculty member. Involving the graduate student with the bad personal relationships between some faculty members. Provide advises to the graduate student based on the personal interest and revenge between some faculty members and not based on what is best for the development of the graduate student nor the program in general. This program is not interested in making a graduate student a professional researcher. Some faculty members seek "dirty" unfair competition instead of professional productive competition that is based on hard work and respect. Some faculty members, who are unfortunately decision makers in the department and the college in general, care about quantity rather quality. Abusing the graduate student by some faculty members, especially the internationals who have no |
other options, and making them work without any respect or appreciation. This is not how scientists and real researcher should be.

<table>
<thead>
<tr>
<th>Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>No comments</td>
</tr>
<tr>
<td>Not any more</td>
</tr>
<tr>
<td>No questions</td>
</tr>
</tbody>
</table>

There is still more room for improvement to make the department of plant and soil sciences one of the best in the US.

might consider waiving the tuition fees for doctoral students as it add financial burden on international students