

CURRICULUM VITA
Charles P. West

ADDRESS:

Updated March 4, 2020

Plant and Soil Sciences
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EDUCATION:

Ph.D. in Crop Production/Physiology, 1981, Iowa State University, Ames, Iowa.
M.S. in Agronomy, 1978, University of Minnesota, St. Paul, Minnesota.
B.S. in Agronomy, 1974, University of Minnesota, St. Paul, Minnesota.

EMPLOYMENT HISTORY:

Professor and Thornton Distinguished Chair, Forage Systems, Department of Plant and Soil Science, Texas Tech University, 2012-present.

Director, College of Agricultural Sciences and Natural Resources Water Center, 2014-present.

Assistant, Associate, and Full Professor, Forage Physiology, 75% research 25% teaching, Department of Crop, Soil and Environmental Sciences, University of Arkansas, 1984-2012.

Postdoctoral Research Fellow, Ruakura Agricultural Research Centre, Ministry of Agriculture and Fisheries, New Zealand, 1982-1984. Research on nitrogen fixation in white clover-ryegrass pastures.

CURRENT RESEARCH AND SYNERGISTIC ACTIVITIES:

Analysis and upgrading of irrigation scheduling programs in the southern High Plains.

Improving soil health of cropland by establishing perennial grasses and legumes.

Use of alfalfa in improving forage quality of grazed Old World bluestem and native grassland.

Modeling water use and growth of warm-season perennial grasses.

Texas Coalition of Sustainable Integrated Systems.
(TeCSIS). <http://www.orgs.ttu.edu/forageresearch/index.html>

Texas Alliance for Water Conservations (TAWC) <http://www.tawc.us>

TEACHING AND ADVISING EXPERIENCE (2012-2019):

PSS 3321 – Forage and Pasture Crops. Junior-Senior level course in forage and pasture ecology and management, Spring 2013-2018.

PSS 5327 – Soil-Plant-Animal Interrelationships in Grazing Lands. Ecological and nutritional principles of livestock grazing. Spring 2014, 2016. Course name changed to Advanced Forage Science in 2018.

PSS 5328 – Forages and Livestock in Pasture Ecosystems. Graduate level course in the science of forage management and forage-livestock systems. Spring 2013-2018.

PSS 4340 – Irrigation Management Seminar (Lead instructor). Survey of irrigation management related to crop production and landscape management, including mechanics and scheduling of irrigation. Fall 2019.

Certificate in Agricultural Water Management – Led the creation of this undergraduate certificate within the College of Agricultural Sciences and Natural Resources. Started in January, 2019.

Advised 6 Ph.D. students and 1 M.S. student. Served on committees of 12 graduate students. Prior to Texas Tech, advised 5 Ph.D. and 16 M.S. students. Served on graduate committees of over 50 students.

Served as international external Ph.D. dissertation reviewer and French habilitation evaluator 4 times.

AWARDS AND FELLOWSHIPS

New Zealand National Research Advisory Council Research Fellow, 1982-1984.
Researcher of the Year Award. 1991. Arkansas Assoc. Cooperative Extension Specialists.
Merit Award. 1993. American Forage and Grassland Council.
Outstanding Service Award. 1995. Arkansas Forage and Grassland Council
Researcher of the Year Award. 2003. Arkansas Assoc. Cooperative Extension Specialists.
Teaching Award of Merit. 2004. Gamma Sigma Delta, University of Arkansas Chapter.
Fulbright Research Scholarship. 2005. Franco-American Commission for Educational Exchange.
Fellow. 2010. Crop Science Society of America.
Fellow. 2011. American Society of Agronomy.
John W. White Team Award. Developing and Revising the Arkansas Phosphorus Index. 2012.
Blue Legacy Award, 2012. Texas Water Conservation Advisory Council.
Integrated Water Resources Management Award. 2013. American Water Resources Association, for conservation education and technology transfer in Texas Alliance for Water Conservation.
Award of Merit. 2014. Southern Pasture and Forage Crops Improvement Conference.
Texas Environmental Excellence Award. 2015. Texas Commission for Environmental Quality for agricultural water conservation efforts by the Texas Alliance for Water Conservation.
Service/Outreach Award. 2015. College of Agricultural Sciences and Natural Resources.
National Water & Energy Conservation Award. 2016. Irrigation Association.
National Academy of Inventors, Texas Tech section. April 27, 2017.
TTU Integrated Scholar. March, 2020
TTU Office of Research % Innovation Outstanding Researcher. April, 2020.

SOCIETY PARTICIPATION:

American Society of Agronomy
American Forage and Grassland Council
Crop Science Society of America
Gamma Sigma Delta, Honor Society of Agriculture
Phi Beta Delta, Society of International Scholars
Sigma Xi, Scientific Research Society
Universities Council on Water Resources, Delegate for Texas Tech University

OFFICES AND COMMITTEES:

Crop Science Society of America
C-6, Crop Quality and Utilization, Chair-elect 1992-1993, Chair 1993-1994.
CSSA Board of Directors, 1992-1994.
G.O. Mott Award Committee, Member and Chair 1991-1993.
DeKalb Crop Science Award Committee, Member 1993-1995.
Associate Editor of *Crop Science*, sections C-3 and C-6 1998-2000.
Golden Opportunities Scholar Committee, Member 2009.
C-6 representative on committee C536.1 Rapid Response Team 2011-present

Organizer and Chair of Arkansas Fescue Toxicosis Conference, 1989.
Gamma Sigma Delta Arkansas Chapter, Treasurer, Vice-President, and President in 1992-1995.
Associate Editor, of *Journal of Production Agriculture*, 1991-1994.
5th International Symposium on *Neotyphodium*/Grass Interactions, Chair, Organizing Committee, 2004.
International Workshop on Summer Dormancy in Grasses, Organizing Committee, 2008-2009.
Water Use Advisory Council, Foundation for Food and Agricultural Research, 2015-2018.

INVITED PRESENTATIONS:

1. **West, C.P.** Ecophysiology of white clover in perennial pastures. 46th Southern Pasture and Forage Crop Improvement Conference. Kilgore, Texas. 8 May 1990.
2. **West, C.P.** Physiological interactions in *Acremonium*-infected grasses. Crop Genetics International, Inc. Hanover, Maryland. 15 May 1990.
3. **West, C.P.** Ecophysiological implications of the tall fescue endophyte in stressed environments. University of Missouri, Columbia. 11 March 1991.
4. **West, C.P.** Interdisciplinary research on fescue toxicosis in Arkansas. Animal-Forage Seminar, University of Missouri, 12 March 1991.
5. **West, C.P.** Role of *Acremonium* endophytes in drought, pest, and pathogen resistance in grasses. Plenary session of 2nd International Symp. *Acremonium*/Grass Interactions, Palmerston North, New Zealand, 2-4 February 1993.
6. **West, C.P.**, H.W. Elbersen, A.A. Elmi, and G.W. Buck. *Acremonium* effects on tall fescue growth: Parasite or stimulant? 50th Southern Pasture and Forage Crop Improvement Conference. Knoxville, TN. 23-25 May 1994.
7. **West, C.P.**, and H.W. Elbersen. 1994. Advances in water relations research with tall fescue-endophyte. Animal-Forage Seminar, University of Missouri, Columbia. 14 September 1994.
8. **West, C.P.**, and A.P. Mallarino. 1996. Nitrogen transfer from legume to grass. Conference on Nutrient Cycling in Forage Systems. 7-8 March, 1996. Columbia, MO.
9. **West, C.P.** 1996. Drought tolerance in tall fescue. Goddard Memorial Lecture, Univ. Tennessee, Knoxville, 16 April, 1996.
10. **West, C.P.** 1996. Collection of fescue-endophyte germplasm in the Mediterranean region. Goddard Memorial Lecture, Univ. Tennessee, Knoxville, 17 April, 1996.
11. **West, C.P.**, M.L. Marlatt, and E.L. Piper. 1996. Novel endophyte technology: Selecting the fungus. CSSA Symposium on Molecular and Cellular Techniques in Forage Improvement. Indianapolis, IN.
12. **West, C.P.** 2001. Beneficial endophytes in tall fescue. Agronomy seminar, University of Missouri, Columbia. 7 March.
13. **West, C.P.** 2001. Inherent and endophyte-mediated plant persistence. CSSA Symposium on Current Research and Extension Efforts on Tall Fescue Toxicosis. Charlotte, NC.
14. **West, C.P.** 2003. ArkPlus: A new tall fescue with a beneficial endophyte. 2nd National Grazinglands Conference. 10 December, Nashville, Tennessee.

15. **West, C.P.** 2007. Plant influences on endophyte expression. 6th International Symposium on Endophyte-Grass Interactions. 25-28 March, Christchurch, NZ.
16. **West, C.P.** 2008. Milestones in tall fescue-endophyte research. Forage Biotechnology Division Seminar Series, 27 October, Noble Foundation, Ardmore, OK.
17. **West, C.P.** 2009. Establishing and maintaining perennial energy crops with emphasis on switchgrass. Transition to a Bioeconomy: The role of extension in energy. Farm Foundation Conference. 30 June-1 July, 2009, Little Rock, AR.
18. **West, C.P.,** P.A. Beck, and K.P. Coffey. 2010. Use of improved tall fescue and endophytes to reduce toxicosis. Crop Production Conference, 3 Dec., 2010, Columbia, MO.
19. **West, C.P.** 2011. What's new in endophyte-infected tall fescue? Alabama Forage Conference: Optimizing Forage Production and Management, 1 Dec., 2011, Guntersville, AL.
20. **West, C.P.,** C.P. Brown, and V.G. Allen. 2013. Integrated crop/forage/livestock systems for the Texas High Plains. 67th Southern Pasture and Forage Crop Improvement Conference. 22-24 Apr., 2013, Tyler, Texas.
21. **West, C.P.,** R. Kellison, C.P. Brown. 2014. An integrated approach to water conservation for agriculture in Texas Southern High Plains. Nebraska Independent Crop Consultants Assoc., Feb 13.
22. **West, C.P.,** R. Kellison, et al. 2014. Regional opportunities and challenges - High Plains. Texas Water Summit, May 19. Austin, TX.
23. **West, C.P.** 2015. Update from the Texas Alliance for Water Conservation. High Plains Irrigation Conference. January 15, Amarillo, TX.
24. **West, C.P.** 2016. Water and agriculture on the Texas High Plains. Texas Tech Climate Science Center monthly seminar series. March 1. <https://www.youtube.com/watch?v=f0BF5H1Kxo0>
25. **West, C.P.** 2016. Conserving irrigation water from the Ogallala; Water footprint of beef production on pastures. OECD Workshop on Virtual Water in Agricultural Products: Quantification, Limitations and Trade Policy. Sponsored by Nebraska Water Center. 14-16 Sep. Lincoln, Nebraska.
26. **West, C.P.** 2017. Linking climate to groundwater conservation. Climate Outlook Forum: Managing Risk and Thinking Ahead. 26 April, Clovis, NM. USDA-ARS Southwest Climate Hub, Las Cruces, NM.
27. **West, C.P.** 2017. Water footprints in High Plains agriculture. Texas Tech Climate Science Center, Science by the Glass, May 9. <https://www.youtube.com/watch?v=cxIW1J2h2q4>
28. **West, C.,** D. Malinowski, and T. McLendon. 2017. Responses of grassland communities to climate changes in Texas and Oklahoma. Proceedings of 71st Southern Pasture and Forage Crop Improvement Conference, p. 9-20. June 5-7, Knoxville, TN. <http://agrifliefcdn.tamu.edu/spfcic/files/2013/02/Proceedings-71st-SPFCIC.pdf>
29. **West, C.P.** 2017. Strategies for economical conservation of irrigation in the Great Plains. New Mexico State University Research Center Agricultural Field Day, Clovis, NM. Aug. 9. Clovis, NM.

30. **West, C.P.**, R. Kellison, C.P. Brown, J. Pate, and D. McCallister. 2017. Stretching the supply of groundwater and making it pay in the Texas South Plains. West Central Research and Extension Center Field Day, Aug. 24. North Platte, NE.
31. **West, C.P.** 2018. Water footprint of stocker beef production. Annual meeting of the American Society of Animal Science. July 11, Vancouver, BC.
32. **West, C.P.** 2018. Advances in irrigation technology for water conservation in the U.S. High Plains. Third International Conference on Water Resources. 27-28 September. Tarija, Bolivia.
33. **West, C.P.**, and E.W. Hellman. 2018. Irrigation scheduling of vineyard. Third International Conference on Water Resources. 27-28 September. Tarija, Bolivia.
34. **West, C.P.** 2018. Role of grasslands and cattle in conversion of irrigated cropland to dryland agriculture. Leu Distinguished Lecture Series, Nebraska Center for Grassland Studies. Nov. 12., Lincoln, NE.
35. **West, C.P.** 2019. Grazing options for rainfed and reduced irrigation scenarios. 2019. TAWC Annual Field Day, Sep. 12, Muncie, TX.
35. **West, C.P.**, and D.M. McCallister. 2019. Irrigation technologies with potential to improve water use efficiency. Symposium: Managing Limited Water Resources In A Changing Climate. 10-13 Nov. American Society of Agronomy annual meeting, San Antonio, TX.

PATENTS:

1. **West, C.P.**, and E.L. Piper. 2002. Plants infected with non-toxic endophytes. Australian patent no. 2001/284,955, issued 21 February, 2002.
2. **West, C.P.**, and E.L. Piper. 2005. Plants infected with non-toxic endophytes. New Zealand patent no. 524715, issued 27 April, 2005.
3. **West, C.P.**, and E.L. Piper. 2008. Non-toxic endophytes, plants injected therewith and methods for injecting plants. U.S. Patent no. 7,465,855 issued 16 Dec. 2008.
Divisional patents based on above parent patent: No. 7,553,654 issued 30 June, 2009.
4. **West, C.P.**, and E.L. Piper. 2011. Non-toxic endophytes, plants injected therewith and methods for injecting plants. U.S. Patent no. 7,977,550 issued 12 July 2011.

EDITORSHIP:

1. **West, C.P.** (ed.) 1989. Proceedings of Arkansas Fescue Toxicosis Conference, July 10 1989, Booneville, AR. Ark. Agric. Exp. Stn. Special Report 140. 58 pp.
2. Roberts, C.A., **C.P. West**, and D.E. Spiers (eds.) 2005. *Neotyphodium* in Cool-Season Grasses. Blackwell Publishing Professional. Ames, IA. 400 pp.
3. Fribourg, H.A., D.B. Hannaway, and **C.P. West** (eds.). 2009. Tall fescue for the twenty-first century. Agron. Monogr. 53. ASA, CSSA, SSSA. Madison, WI. Also available at <http://forages.oregonstate.edu/tallfescuemonograph/>

BOOK CHAPTERS:

1. **West, C.P.**, and K.D. Gwinn. 1993. Role of *Acremonium* in drought, pest, and disease tolerances of grasses. p. 131-140. *In* D.E. Hume, G.C.M. Latch, and H.S. Easton (ed.) Proc. 2nd Int. Symp. on *Acremonium*/Grass Interactions: Plenary papers. AgResearch, Grassland Research Centre, Palmerston North, New Zealand.
2. **West, C.P.** 1994. Endophyte-infected grass physiology and drought tolerance. p. 87-99. *In* C.W. Bacon and J.F. White, Jr. (ed.) Biotechnology of endophytic fungi of grasses. CRC Press, Inc., Boca Raton, FL
3. Kephart, K.D., **C.P. West**, and D.A. Wedin. 1995. Grassland ecology and improvement. p. 141-153. *In* R.F Barnes et al. (ed.) Forages Volume I: An introduction to grassland agriculture. 5th edition. Iowa State Univ. Press, Ames, IA.
4. Sleper, D.A., and **C.P. West**. 1996. Tall fescue. p. 471-502. *In* L.E. Moser, D.R. Buxton, and M.D. Casler (ed.) Cool season forage grasses. Agron. Monogr. 34. ASA, Madison, WI.
5. **West, C.P.**, and A.P. Mallarino. 1996. Nitrogen transfer from legumes to grasses. p. 167-175. *In* R.E. Joost and C.A. Roberts (ed.) Nutrient cycling in forage systems. Potash and Phosphate Institute, Norcross, GA.
6. **West, C.P.**, E.L. Piper, M.L. Marlatt, M.E. McConnell, and T.J. Kring. 1998. Novel endophyte techniques: Selecting the fungus. p. 105-115. *In* C.E. Brummer and N.S. Hill (ed.) Molecular and cellular techniques in forage improvement. CSSA Spec. Publ. 26. Crop Sci. Soc. Am., Madison, WI.
7. **West, C.P.** 1998. Grass endophytes. p. 161-163. *In* J. Weil (ed.) McGraw-Hill yearbook of science and technology 1999. McGraw-Hill, New York.
8. **West, C.P.**, and C.J. Nelson. 2003. Naturalized grassland ecosystems and their management. p. 315-337. *In* R. F Barnes et al. (ed.) Forages: An introduction to grassland agriculture. Vol. I. 6th edition. Iowa State University Press, Ames, IA.
9. **West, C.P.**, and J.C. Waller. 2007. Forage systems for humid transition areas. p. 313-321. *In* R.F Barnes et al. (ed.) Forages: The science of grassland agriculture Vol. II. 6th edition. Blackwell Publishing, Ames, IA.
10. **West, C.P.** 2007. Plant influences on endophyte expression. p. 117-121. *In* A.J. Popay and E.R. Thom (ed.) Proc. 6th Int. Symp. Endophyte-Grass Interactions. Grassland Research and Practice Series no. 13, NZ Grassland Association, Christchurch, NZ.
11. Sharpley, A.N., and **C. West**. 2008. Pressures on beef grazing in mixed production farming. p.187-208. *In* R.W. McDowell (ed.) Environmental impacts of pasture-based farming. CABI Publishing, Wallingford, Oxfordshire, UK.
12. Sharpley, A., S. Herron, **C. West**, and T. Daniel. 2009. Outcomes of phosphorus-based nutrient management in the Eucha-Spavinaw watershed. In: A. Franzluebbbers, editor, Farming with grass: Sustainable mixed agricultural landscapes in grassland environments. Soil and Water Conservation Society, Ankeny, IA. p. 192-204.

13. Sheaffer, C.C., L.E. Sollenberger, M.H. Hall, **C.P. West**, and D.P. Hannaway. 2009. Grazinglands, forages, and livestock in humid regions. p. 95-119. *In* W.F. Wedin and S.L. Fales (ed.) Grassland: Quietness and strength for a new American agriculture. ASA, CSSA, SSSA, Madison, WI.
14. Belesky, D.P., and **C.P. West**. 2009. Abiotic stresses and endophyte effects. p. 49-64. *In* H.A. Fribourg et al. (ed.) Tall fescue for the 21st century. Agron. Monogr. 53. ASA, CSSA, SSSA, Madison, WI. Also available at <http://forages.oregonstate.edu/tallfescuemonograph/>.
15. Hannaway, D.B., C. Daly, M. Halbleib, D. James, **C.P. West**, et al. 2009. Development of suitability maps with examples for the United States and China. p. 33-47. *In* H.A. Fribourg et al. (ed.) Tall fescue for the twenty-first century. Agron. Monogr. 53. ASA, CSSA, SSSA, Madison, WI. Also available at <http://forages.oregonstate.edu/tallfescuemonograph/>.
16. Fribourg, H.A., D.B. Hannaway, and **C.P. West**. 2009. Accomplishments and challenges. p. 511-515. *In* H.A. Fribourg et al. (ed.) Tall fescue for the twenty-first century. Agron. Monogr. 53. ASA, CSSA, SSSA, Madison, WI. Also available at <http://forages.oregonstate.edu/tallfescuemonograph/>.
17. **West, C.P.** 2013. Endophytes – Good and Bad. p. 31-35. *In* S. Bittman and D. Hunt (eds.) Cool forages: Advanced management of temperate forages. Pacific Field Corn Association, Agassiz, B.C. V0M 1A0, Canada.
18. **West, C.P.**, and C.J. Nelson. 2018. Grassland ecosystems and their management. *In* M. Collins, C.J. Nelson, K.J. Moore, and R.F Barnes (eds.) Forages: An introduction to grassland agriculture. Vol. I. 7th edition. John Wiley & Sons, Hoboken, NJ. pp. 357-371.

JOURNAL PUBLICATIONS:

1. **West, C.P.**, N.P. Martin, and G.C. Marten. 1980. Nitrogen and *Rhizobium* effects on establishment of legumes via strip tillage. Agron. J. 72:620-624.
2. Mallarino, A.P., W.F. Wedin, R.D. Voss, and **C.P. West**. 1983. The phosphorus requirements of alfalfa-smooth bromegrass-orchardgrass and reed canarygrass pastures under two grazing pressures. Agron. J. 75:291-294.
3. **West, C.P.**, and W.F. Wedin. 1985. Dinitrogen fixation in alfalfa-orchardgrass pastures. Agron. J. 77:89-94.
4. **West, C.P.**, and K.W. Steele. 1985. White clover cultivar evaluation for the Waikato - Establishment phase. Proc. N. Z. Grassl. Assoc. 46:217-220.
5. **West, C.P.**, and K.W. Steele. 1986. Differential tolerance of white clover cultivars to stem nematode [*Ditylenchus dipsaci* (Kuhn) Filipjev]. N.Z. J. Exper. Agric. 14:227-279.
6. **West, C.P.**, E. Izekor, D.M. Oosterhuis, and R.T. Robbins. 1988. The effect of *Acremonium coenophialum* on the growth and nematode infestation of tall fescue. Plant Soil 112:3-6.
7. **West, C.P.**, A.P. Mallarino, W.F. Wedin and D.B. Marx. 1989. Spatial variability of soil chemical properties in grazed pastures. Soil Sci. Soc. Amer. J. 53:784-789.
8. Goetsch, A.L., R.K. Fulton, G.E. Murphy, E.W. Grant, L.A. Forster, B.L. Goetsch, Z.B. Johnson, **C.P. West**, and E.L. Piper. 1989. Parasite treatments for crossbred beef steers grazing high- and low-endophyte tall fescue. Prof. Anim. Sci. 5:28-32.

9. **West, C.P.**, D.M. Oosterhuis, and S.D. Wullschleger. 1990. Osmotic adjustment in tissues of tall fescue in response to water deficit. *Environ. Exp. Bot.* 30:149-156.
10. Walker, D.W., **C.P. West**, R.K. Bacon, D.E. Longer, and K.E. Turner. 1990. Changes in forage yield and composition of wheat and wheat-ryegrass mixtures with maturity. *J. Dairy Sci.* 73:1296-1303.
11. Mallarino, A.P., W.F. Wedin, R.S. Goyenola, C.H. Perdomo, and **C.P. West**. 1990. Legume species and proportion effects on dinitrogen fixation in legume-tall fescue associations. *Agron. J.* 82:785-789. doi:10.2134/agronj1990.00021962008200040026x
12. Mallarino, A.P., W.F. Wedin, C.H. Perdomo, R.S. Goyenola, and **C.P. West**. 1990. Nitrogen transfer from white clover, red clover, and birdsfoot trefoil to associated grass. *Agron. J.* 82:790-795. doi:10.2134/agronj1990.00021962008200040027x
13. Moubarak, A.S., E.L. Piper, and **C.P. West**. 1990. Interaction of ergot alkaloids with synaptosomal ATPase system. *Medical Sci. Res.* 18:709-710.
14. Beyrouthy, C.A., **C.P. West**, and E.E. Gbur, Jr. 1990. Root development of bermudagrass and tall fescue as affected by cutting interval and growth regulator. *Plant Soil* 127:23-30.
15. Goetsch, A.L., L.A. Forster, Jr., G.E. Murphy, E.W. Grant, and **C.P. West**. 1990. Digestion and live weight gain by beef cattle consuming bermudagrass and supplemented with grain or different high-protein feedstuffs. *Anim. Prod.* 51:263-275.
16. Goetsch, A.L., G.E. Murphy, W.W. Grant, L.A. Forster, Jr., D.L. Gallaway, **C.P. West**, and Z.B. Johnson. 1991. Effects of animal and supplement characteristics on grazing live weight gain by growing cattle. *J. Anim. Sci.* 69:433-442.
17. **West, C.P.**, D.W. Walker, R.K. Bacon, D.E. Longer and K.E. Turner. 1991. Phenological analysis of forage yield and quality in winter wheat. *Agron. J.* 83:217-224. doi:10.2134/agronj1991.00021962008300010051x
18. Hubbell, D.S., A.L. Goetsch, K.F. Harrison, D.L. Galloway, Sr., L.A. Forster, Jr., F. Li., **C.P. West**, and K. Patal, and W. Sun. 1992. Live-weight gain by calves grazing cool-season annual grass in the spring and supplemented with grass hays. *Can. J. Anim. Sci.* 72:435-439.
19. **West, C.P.**, E. Izechor, K.E. Turner, and A.A. Elmi. 1993. Endophyte effects on growth and persistence of tall fescue along a water supply gradient. *Agron. J.* 85:264-270. doi:10.2134/agronj1993.00021962008500020019x
20. Mahmood, T., R.C. Gergerich, E.A. Milus, **C.P. West**, and C.J. D'Arcy. 1993. Incidence of barley yellow dwarf viruses in wheat, endophyte-infected and endophyte-free tall fescue, and other hosts in Arkansas. *Plant Disease* 77:225-228.
21. Moubarak, A.S., E.L. Piper, **C.P. West**, and Z.B. Johnson. 1993. Interaction of purified ergovaline from endophyte-infected tall fescue with synaptosomal ATPase enzyme system. *J. Agric. Food Chem.* 41:407-409.
22. Moubarak, A.S., E.L. Piper, and **C.P. West**. 1993. Effects of ergotamine and ergonovine on the renal ATPase system in the rat. *Med. Sci. Res.* 21:289-290.

24. Turner, K.E., **C.P. West**, E.L. Piper, S.A. Mashburn, and A.S. Moubarak. 1993. Quality and ergovaline content of tall fescue silage as affected by harvest stage and addition of poultry litter and inoculum. *J. Prod. Agric.* 6:423-427.
25. Piper, E.L., and **C.P. West**. 1993. Role of endophytes in tall fescue. *Proc. Ark. Acad. Sci.* 47:89-92.
26. Goetsch, A.L., D.L. Galloway, Sr, L.A. Forster, Jr, G.E. Murphy, E.W. Grant, W. Sun, A. Patil, and **C.P. West**. 1993. Effects of various supplements on voluntary intake and performance by growing cattle consuming forage moderate to high in crude protein. *Archives of Animal Nutrition* 44:163-174.
27. Holder, T.L., **C.P. West**, K.E. Turner, M.E. McConnell, and E.L. Piper. 1994. Incidence and viability of *Acremonium* endophytes in tall fescue and meadow fescue plant introductions. *Crop Sci.* 34:252-254.
28. Chen, C., D.A. Sleper, and **C.P. West**. 1995. RFLP and cytogenetic analyses of hybrids between *Festuca mairei* and *Lolium perenne*. *Crop Sci.* 35:720-725.
29. Elmi, A.A., and **C.P. West**. 1995. Endophyte effects on tall fescue stomatal response, osmotic adjustment, and tiller survival. *New Phytologist* 131:61-67.
30. Patil, A.R., A.L. Goetsch, K.K. Park, B. Kouakou, D.L. Galloway, Sr., and **C.P. West**. 1995. Influences of grass source and quality on net flux of nutrients across splanchnic tissues of sheep. *Livestock Production Science* 43:49-61.
31. Ledgard, S.F., M.S. Sprosen, K.W. Steele, and **C.P. West**. 1995. Productivity of white clover cultivars under intensive grazing, as affected by high nitrogen fertiliser application. *N. Z. J. Agric. Res.* 38: 473-482.
32. Patil, A.R., A.L. Goetsch, K.K. Park, B. Kouakou, D.L. Galloway, Sr., **C.P. West**, and Z.B. Johnson. 1996. Influences of grass source and legume level on net flux of nutrients across splanchnic tissues in sheep. *Small Ruminant Res.* 22:111-122.
33. Elbersen, H.W., and **C.P. West**. 1996. Growth and water relations of field grown tall fescue as influenced by drought and endophyte. *Grass and Forage Science* 51:333-342.
34. Oliviera, J.A., D.A. Sleper, **C.P. West**, S.S. Boughrara, and J. Coutts. 1996. Efecto de dos cepas del hongo endofito *Acremonium coenophialum* sobre la respuesta al estrés hídrico en una población de festuca alta 'Himag'. *Revista Pastos* 26:177-184.
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EXPERIMENT STATION PUBLICATIONS (IN-HOUSE REFEREED)

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150. **West, C.P.**, E.W. Hellman. 2018. Irrigation scheduling of vineyard. Third International Conference on Water Resources. 27-28 September. Conference Abstracts. Tarija, Bolivia.
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153. Dhakal, Madhav, and **C.P. West**. 2018. Can interseeded alfalfa deplete water in semi-arid grassland? 5-8 Nov. *In Annual meetings abstracts [CD-ROM]*. ASA and CSSA,, Madison, WI. Poster.
154. Bhandari, Krishna, **C.P. West**, S.B Longing, V. Acosta-Martinez, and D. Klein. 2018. Arthropod and soil microbial communities in forage-livestock systems. 5-8 Nov. *In Annual meetings abstracts [CD-ROM]*. ASA and CSSA,, Madison, WI. Oral.
155. Xiong, Victoria, **C.P. West**, and J.R. Kiniry. 2018. Applying digital image analysis to simulate growth of old world bluestem with ALMANAC. 5-8 Nov. ASA and CSSA, *In Annual meetings abstracts [CD-ROM]*. ASA, CSSA, and SSSA, Madison, WI.
156. Sun, Y., W. Guo, D.C. Weindorf, F. Sun, S.K. Deb, Z. Lin, J. Neupane, A. Raihan, and **C.P. West**. 2018. Assessing within-field spatial variability of Ca using proximal and remote sensing. 5-8 Nov. *Annual meetings abstracts [CD-ROM]*. ASA and CSSA,, Madison, WI.

157. Neupane, J., W. Guo, F. Zhang, Z. Lin, Y. Sun, A. Raihan, S. Deb, and **C.P. West**. 2018. Cotton yield variability in relation to irrigation rates, soil physical properties and topography. 5-8 Nov. Annual meetings abstracts [CD-ROM]. ASA and CSSA, Madison, WI.
158. **West, C.P.** 2018. Role of forage crops and grazing in the water-limited Texas High Plains. Leu Distinguished Lecture Series, Nebraska Center for Grassland Studies. Nov. 12., Lincoln, NE.
159. Bhandari, Krishna, **C.P. West**, V. Acosta-Martinez, and J. Cotton. 2018. Soil health indicators as affected by diverse forage species and mixtures in semi-arid pastures. *In* Annual meeting of Ogallala Water CAP project. Nov. 29-30, Santa Fe, NM.
160. Longing, S.D., C. Jewett, B. Rendon, S. Discua Duarte, R. Cox, C. McKenney, N. McIntyre, and **C.P. West**. 2018. An assessment of bee richness and community structure across different agroecosystems on the Southern High Plains (Texas, USA). XXV International Congress of Entomology. Orlando, FL.
161. Longing, S.D., **C.P. West**, N. McIntyre, R. Cox, and C. McKenney. 2018. Demonstrations of pollinator habitat and a framework for regional implementation in the U.S. Southern High Plains. SWCS International Annual Conference, Albuquerque, NM. Soil Water Conservation Society.
162. Otuya, R.K., L.C. Slaughter, **C.P. West**, V. Acosta-Martinez, and S.K. Deb. 2019. Soil microbial communities and soil health in semi-arid pastures of the Texas Southern High Plains. 6-9 Jan. Annual Meetings Abstracts, Soil Science Society of America, Madison, WI.
163. Kharel, G., S. Deb, **C. West**, and L. Slaughter. 2019. Evaluation of thermal conductivity models for semiarid pasture soils. 6-9 Jan. Annual Meetings Abstracts, Soil Science Society of America, Madison, WI.
164. Neupane, Jasmine, W. Guo, A. Raihan, Z. Lin, Y. Sun, **C. West**, and F. Zhang. 2019. Influence of soil physical properties and topography on cotton yield under different irrigation rates. Texas Tech University Graduate Student Research Poster Competition. 26 March.
165. **West, C.P.** 2019. Water decline and climatic stress impacts agricultural land use in the Texas High Plains. Symposium on After Design: Monitoring and Managing the Texas Landscape. Texas Tech University. 4-5 April.
166. Ritz, R., D.M. McCallister, and **C. West**. 2019. Connecting agricultural water conservation education from students to producers and consumers. April 10, Texas Tech University. Regional Engaged Scholarship Symposium.
167. Dhakal, M., **C.P. West**, S.K. Deb, C. Villalobos, and G. Kharel. 2019. Trade-off between forage quality improvement and crop water use for alfalfa-grass system. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.
168. **West, C.P.**, and D.M. McCallister. 2019. Irrigation technologies with potential to improve water use efficiency. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.
169. Hayhoe, Katharine, Anne Stoner, and **C.P. West**. 2019. High-resolution climate projections for agriculture and water management. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.

170. Bhattarai, B., S. Singh, **C.P. West**, C.L. Trostle, and G.L. Ritchie. 2019. Forage sorghum, pearl millet, and corn physiology, nutrient content, and yield under deficit irrigation. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.
171. Bhattarai, B., S. Singh, **C.P. West**, C.L. Trostle, and G.L. Ritchie. 2019. Soil water depletion patterns and water use efficiency of forage sorghum, pearl millet, and corn under deficit irrigation. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.
172. Lin, Zhe, W. Guo, Y. Sun, **C.P. West**, and F. Jin. 2019. Unmanned aerial systems and crop modeling for irrigation scheduling in the Southern High Plains. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.
173. Radicke, Kathryn, **C.P. West**, and D.D. Henry. 2019. Can alfalfa in mixture with grass reduce enteric methane emissions from cattle on pasture? 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.
174. Radicke, Kathryn, J. Ning, **C.P. West**, and C.P. Brown. 2019. Assessment of drone image analysis of legume cover in pastures in relation to ground assessment. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.
175. Bhandari, K.B., S.D. Longing, and **C.P. West**. 2019. Honey bees and other focal species in corn treated with atoxigenic strains of *Aspergillus flavus*. 10-13 Nov., San Antonio, Annual Meetings Abstracts, ASA-CSSA-SSSA, Madison, WI.

TALKS AND PRESENTATIONS TO PRODUCER GROUPS:

Many oral presentations since 1984 to Arkansas extension and farmer groups such as for the Arkansas Forage and Grassland Council annual meeting, the Arkansas Beef Research Conference, field days, study days and short courses on fescue toxicity, hay storage, forage cultivar performance, use of legumes in sustainable agriculture, grazing management, and riparian restoration.

Forage Field Days organized at the UA Agronomy Farm in 1990 and 1992.

Instructor for Arkansas Grazing School (1996-2000), and NRCS-Arkansas Pasture Ecology workshops (2009-2012).

Frequent speaker for NW Arkansas Grassroots Grazing Group (2000-2012).

Speaker at producer meetings and field days on conserving irrigation water in the Texas High Plains in 2013-2015.

Invited to speak at Nebraska Independent Crop Consultants meeting in 2014.

Invited to speak at Texas Water Summit, Austin, TX, 2014.

Co-organized and spoke at Forage and Livestock Field Day, New Deal, TX, 2015.

Spoke at 3rd annual Southwest Ranchers Roundtable, Lubbock, TX, 2015.

Agricultural field day at New Mexico State University Research Center, Clovis. Aug. 9, 2017

Agricultural field day at West Central Nebraska Research and Extension Center, North Platte, NE, 2017.

Webinar for Climate Learning Network/ANREP on boosting producer learning, Nov. 2, 2017.

Co-organized and spoke at TeCSIS/TAWC Field Day, New Deal, TX, July 24, 2019.

Field Day of Texas Alliance for Water Conservation, Muncie, TX, Sep. 12, 2019.

CONSULTING:

Bermudagrass stand establishment at Fayetteville sewage sludge land application site. 1987-88. United Pacific Insurance Co.

Physiological effects of *Clavibacter xylii cynodensis* on drought stress response in corn. August, 1990. Crop Genetics International, Inc.

Development of forage crop curriculum for the Universidad Autónoma Moreno, Santa Cruz, Bolivia, through Partners of the Americas. 1991.

Forage management and irrigation recommendation for canning effluent disposal. July, 1996. Allen Canning Co., Siloam Springs, AR.

Nutrient management of poultry and swine waste for forage production with beef cattle. February, 1997. Arkansas Center for Technology Transfer, Fayetteville, AR.

Pasture improvement in Santa Cruz, Bolivia. November, 1998, and March, 2000. Partners of the Americas, Farmer-to-Farmer Program.

L'Oréal Inc. Advised on using biomass to fuel an electric power plant for their factory in North Little Rock. 2010.

Grant review panel for Oklahoma Center for Advancement of Science and Technology, Plant Science Research Competition. December, 2008 and 2009.

Member of Water Advisory Council for Foundation for Food and Agriculture Research, 2016-2019.

GRANTS:

My share of funds Total \$5,100,000 since 1984. I administered \$6.2 million of TAWC Phase 1, and \$3.6 million of TAWC Phase 2, most of which was distributed to cooperating researchers.

Digestibility of crabgrass as a forage. 1984. Samuel Roberts Noble Foundation. \$10,000.

Forage quality and animal utilization research equipment. 1984-1986. Arkansas Department of Higher Education. \$78,500.

Travel to XV Intl. Grassland Congress, Japan. 1985. American Forage and Grassland Council. \$750.

Evaluation of small grains for forage. 1985-86. Arkansas Beef Council. \$10,000.

Influence of endophyte on drought tolerance and pest resistance in tall fescue. 1987-1989. Arkansas Beef Council. \$15,000.

Screening of forage legumes for persistence under grazing. 1987-89. Arkansas Beef Council. \$3,200.

Herbicide testing for brush control in pastures. 1987. PBI/Gordon. \$750

Bermudagrass establishment on sewage sludge application site. 1987-88. United Pacific. \$1,200.

The biology and treatment of endophyte-induced fescue toxicity. 1988-1992. Arkansas Department of Higher Education. (E. Piper PI, C. West Co-PI) \$148,000.

Travel to XVI Intl. Grassland Congress, France. American Forage and Grassland Council. \$500.

Identification of low-toxicity strains of *Acremonium* endophyte. 1990-1992. Research Center for Alternative Pest Control, USDA-CSRS Special Grants Program. (C. West PI) \$75,000.

Development of an endophyte-infected tall fescue with low toxicity. 1990. Arkansas Beef Council. (E. Piper PI, C. West Co-PI) \$15,000.

Evaluation of EZ-Soil potting medium. 1990. DuPont, Inc. (C. West PI) \$5,000.

Identification and introduction of desirable *Acremonium* endophytes into elite tall fescue germplasm. 1991-1993. USDA-CSRS Southern Regional IPM. (C. West PI) \$67,121.

Evaluation of *Festuca* germplasm for *Acremonium* endophyte infection and viability. 1991. USDA-ARS-NPGS. (C. West PI) \$5000.

Genetic evaluation of *Acremonium* and tall fescue germplasm for drought resistance. 1992-1993. Cooperative Research Agreement among Univ. of Arkansas, Univ. of Missouri and USDA-ARS. (C. West PI) \$42,000.

Acremonium effects on gas exchange and abscisic acid production in tall fescue. 1992-93. Cooperative Research Agreement among Univ. of Missouri, Univ. of Arkansas, and USDA-ARS. (R.E. Joost PI, C. West Co-PI) \$30,000.

Biotechnology of novel *Acremonium*-grass associations. 1992. Research Center for Alternative Pest Control, USDA-CSRS Special Grants Program. (C. West PI) \$16,107.

Formation of a new endophyte-infected tall fescue cultivar. 1992-1995. Arkansas Dept. Higher Education Economic Development Grant. (C. West PI) \$111,000.

Use of *Acremonium* endophytes to enhance resistance of tall fescue and wheat to insects and nematodes. 1993-1996. Research Center for Alternative Pest Control. USDA-CSRS Special Grants Program. (C. West PI) \$173,485.

Acquisition of *Festuca* germplasm from the western Mediterranean region. 1993. USDA-ARS National Plant Germplasm System. (C. West PI) \$14,379.

Reduction of fescue toxicosis through plant improvement. 1995-1998. Cooperative Research Agreement among Univ. of Missouri, Univ. of Arkansas, and USDA-ARS. (C. West PI) \$43,000/ year.

Tall fescue and endophyte interaction for expression of drought tolerance. 1995-1997. USDA-NRICGP. (C. West PI) \$86,211.

Reduction of fescue toxicosis through and plant and animal management and improvement. 1998-2003. Cooperative Research Agreement among Univ. of Missouri, Univ. of Arkansas, and USDA-ARS. (C. West PI) \$58,000-89,000/year.

NLEAP model for global climate change. 2000-2001. USDA-NRCS. (C. West PI) \$65,000.

Fescue toxicosis physiology and management. 2003-2008. Specific Cooperative Agreement between Univ. of Arkansas and USDA-ARS. (C. West PI) \$130,000/year.

Endophyte, plant, and animal improvement for mitigating fescue toxicosis. 2008-2011. Specific Cooperative Agreement between Univ. of Arkansas and USDA-ARS. (C. West PI) \$131,000/year.

Breeding and testing of new switchgrass cultivars for increased biomass production in Oklahoma, Arkansas, Texas, and Kansas. 2009-2010. South Central Sun Grant (Y. Wu PI, C. West Co-PI) \$11,250.

Development of agroforest systems for bioenergy crop production and ecosystem services in the Lower Mississippi Alluvial Valley. 2009-2012. USDA SARE (H. Liechty PI, C. West Co-PI et al.) \$8,282.

Grasses as dedicated energy feedstocks in Arkansas. 2009-2011. DOE Mid-South and Southeast Consortium. (C. West PI, et al.) \$164,819.

Biomass and macronutrient accumulation and losses of switchgrass during and after the growing season. 2009-2011. International Plant Nutrition Institute (C. West, PI) \$26,200.

A model forage system for the carbon economy and changing climate, 2010-2011. USDA-NIFA-AFRI Climate Change Planning Grant (C. West PI, et al.) \$50,000.

Impact of bioenergy crops on pests and natural enemies in agricultural and non-crop landscapes, 2011-2013. USDA-NIFA-AFRI Sustainable Bioenergy: Crop Protection. (T.J. Kring PI, C. West co-PI). \$19,712.

Carbon sequestration and greenhouse gas emissions associated with cellulosic bioenergy feedstock production on marginal agricultural lands, 2011-2014. USDA-NIFA-AFRI Sustainable Bioenergy: Carbon Sequestration. (M. Blazier PI, C. West co-PI). \$49,156.

Assessing and predicting switchgrass and high-biomass sorghum yields and economic viability, 2011-2014. South Central Sun Grant USDOT-USDA. (F. Fritschi Univ. Missouri PI, C. West co-PI). \$40,000.

Developing switchgrass for increased biomass production in Oklahoma, Arkansas, Texas, and Kansas, 2011-2014. South Central Sun Grant Initiative USDOT-USDA. (Y. Wu Oklahoma State Univ. PI, C. West co-PI). \$18,000.

Calibration and validation of ALMANAC model for growth curves of warm-season grasses under limited water supply, 2012-2014. Ogallala Aquifer Program, USDA-ARS. \$76,395.

New water management technologies to sustain rural economies, 2014-2016. Ogallala Aquifer Program, USDA-ARS. \$20,000. PI.

Enhancing the viability of forage sorghum for beef cattle production in the Southern Great Plains. 2014. S. Trojan, **C.P. West**. Advanta US. \$149,952. My share \$7,498 (5%). 2014-2015.

C.P. West (Lead PI) et al. Texas Alliance for Water Conservation, Phase 2. 2014-2020. Texas Water Development Board. \$3.6 million. 2015-2020. My share \$215,000.

C.P. West (Lead PI). Long-term agro-ecosystems research and adoption in the Texas Southern High Plains. USDA Southern SARE Large Systems Research program. \$600,000. \$100,000 per year from 2014-2020.

Sustaining agriculture through adaptive management resilient to a declining Ogallala Aquifer and changing climate. Meagan Schipanski (CSU, Lead PI) and 12 co-PDs including **C.P. West**. USDA-NIFA-AFRI CAP. \$10,000,000. My share \$516,850 over 4 years. Funding starting in 2016.

Circles of live buffer strips in a center pivot to improve multiple ecosystem services and sustainability of irrigated agriculture in the Southern Great Plains (Revised). S. Angadi (NMSU), P. Gowda (USDA-ARS), **C.P. West**. USDA-NIFA-AFRI. \$499,946. My share \$0; I act as collaborating consultant on grasses used for buffer strips. 2016-2018.

S. Longing, C. McKenney, N. McIntyre, R. Cox, , **C.P. West**. Demonstration of pollinator conservation practices and a framework for regional implementation on the Southern High Plains. Conversation Innovation Grant Program, USDA-NRCS. \$391,461 over 4 years, with matching cost-share. My share is \$19,573 (5%). 2016-2018.

L. Baxter (student advisee), and **C.P. West**. Evaluation of winter annual cover crops under multiple residue managements: Impacts on land management, soil water depletion, and cash crop productivity. USDA Southern SARE Graduate Student Grant Program. \$9,511. 2015-2018.

C.P. West, and C. Villalobos. Improving grassland quality with drought-tolerant alfalfa. CH Foundation. \$71,018. 2017-2019.

Comparing forage potential of forage sorghum, pearl millet, and corn under limited irrigation. S. Singh, **C. West**, and C. Trostle. High Plains Underground Water Conservation District (HPWD), Lubbock, TX. \$44,264. My share is \$8,853 (5%). 2017-2018.

C.P. West (Lead PI). Water management to sustain the economic activity from the Ogallala Aquifer on the Southern High Plains-TTU. Ogallala Aquifer Program, USDA-ARS. \$66,559 (20%). 2017-2019.

C.P. West (Lead PI). Transition from deficit irrigation to dryland production in the Texas High Plains. USDA ARS Specific Cooperative Agreement with Cropping Systems Research Laboratory. \$104,129. 2018.

C.P. West (Lead PI). Transition from deficit irrigation to dryland production in the Texas High Plains. USDA ARS Specific Cooperative Agreement with Cropping Systems Research Laboratory. \$126,236. 2019.

Lindsey Slaughter, **C.P. West**, Sanjit Deb. Greenhouse gas emissions from soils of semi-arid pastures: Response to forage type and legume presence. Young Scholar Enhancement grant program. USDA Southern Regional Sustainable Agriculture Research and Education (SARE). \$2,778. 2018.

C.P. West. Water management to sustain the economic activity from the Ogallala Aquifer on the Southern High Plains-TTU. Ogallala Aquifer Program, USDA-ARS. Lead PI. \$35,000. 2018.

C.P. West. Water management to sustain the economic activity from the Ogallala Aquifer on the Southern High Plains-TTU. Ogallala Aquifer Program, USDA-ARS. Lead PI. \$213,468 2019. My share: 100,000.

C.P. West. Graduate student research by Kathryn Radicke: Effects of cumulative cattle trampling on soil bulk density on an annual forage crop pasture. USDA Southern Regional Sustainable Agriculture Research and Education (SARE). \$9,001. 2018-2019.

K. Bhandari, S. Longing, **C.P. West**. Honey bees and other focal species in corn treated with atoxigenic strain of *Aspergillus flavus*. Texas Corn Producers Board. \$45,764. My share \$40,000. 2019.

C.P. West, S.D. Longing, and K.B. Bhandari. Assessing water use efficiency, soil health, and pollinators within a transition from irrigation to dryland management in the Texas High Plains. USDA-NIFA Southern Regional Sustainable Agriculture Research and Education (SARE). \$299,208.