TEXAS TECH UNIVERSITY™

Lavender Research

Asexual Propagation Methods

Derek W. Reed

Plant and Soil Science Department
Ornamental Horticulture Research Group
Texas Tech University

Fall 2018

Goal

Goal of this experiment is to determine the most effective way to asexually propagate lavender.

TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Lavender Varieties

We are working with three different varieties of lavender:

- **Grosso**
- **Provence**
- **Edelweiss**

All of our lavender cuttings were taken from Thistledew Lavender Farms just outside of Dickens Texas.

Grosso

A hybrid cross between English lavender and Portuguese lavender commonly referred to as Lavandin or French Hybrid Lavender.

The English lavender gives the plant cold hardiness while the Portuguese lavender provides a heat tolerance.

One of the most fragrant lavenders out there, and the most used lavender in essential oil production.

It is a vigorous grower expanding two to three feet in height and width in a tight mound.

Leaves are silvery green in color and the plant produces rich deep purple spikes that can grow up to 6 inches.

Hardiness zone 5-9

TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Provence

Also a Lavandin variety

It is extremely fragrant and a popular variety for essential oil production. Its flower heads can be up to three inches in length.

Much like Grosso, Provence grows to be two to three feet in height and width in a tight mound with silvery green leaves.

Hardiness zone 5-9

TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Edelweiss

A Lavandin variety.

Its leaves and flowers are highly fragrant and commonly used in teas and cooking. It is also commonly used in wreath making.

Smaller than the other two varieties Edelweiss only grows to be about two feet in height.

Grows in compact mounds with silvery leaves. Unlike the most lavenders Edelweiss produces white flowers. These flowers start off as off pink buds, but bloom to be pure white. It creates excellent contrast to the purple lavenders when planted next to each other.

Hardiness zone 5-9

TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Cuttings

Cuttings were made from last years growth for the first trail (April 2), and the new growth (June 20th) for the second trial.

All cuttings taken were four to six inches in length with no flower spikes.

The cuttings were taken from a few different plants of each variety, then placed in labeled buckets with water and sealed to hold in moisture and prevent spills.

We will be returning to ThistleDew Lavender Farms Tuesday, August 28th for a third round of cuttings.

Experiment

Factors

Two different types of media- Perlite and greenhouse soil mix

Rooting solutions- Rhizopon aa #3, Hortus, and a control

Each trial was replicated three times per flat for six flats. Which meant we needed at least 324 cuttings.

TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

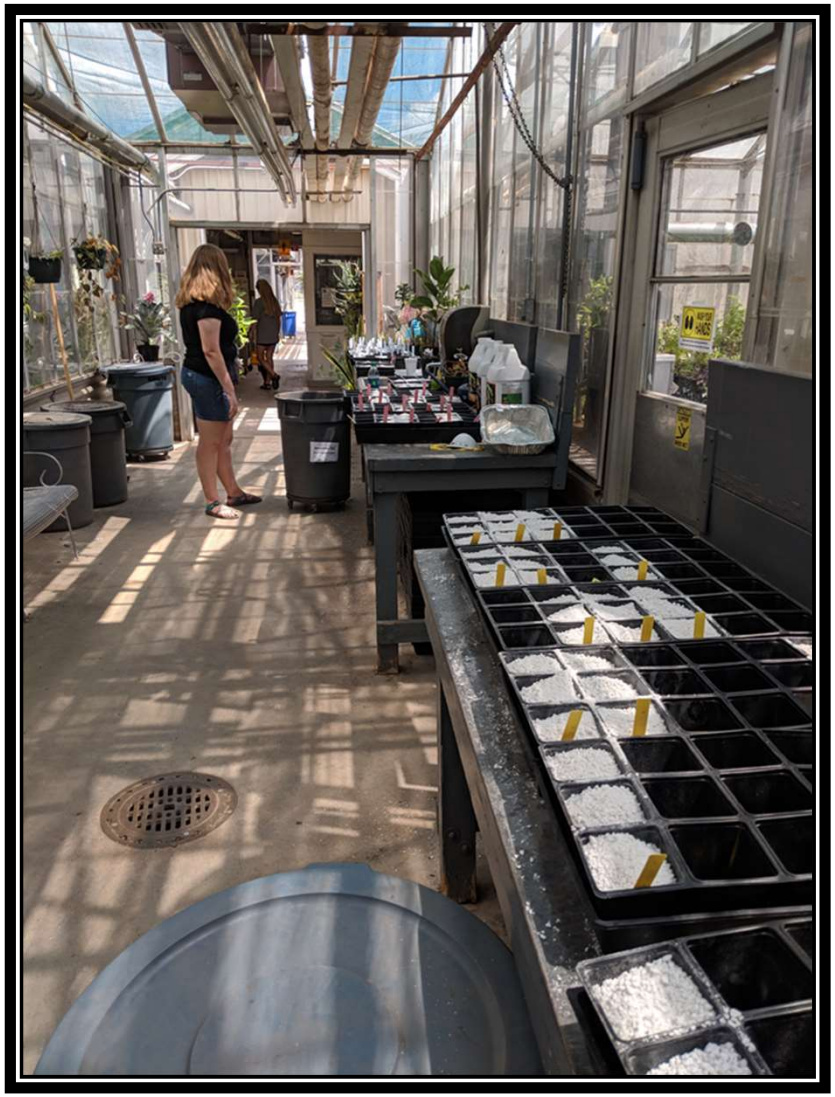
Set up- Media

Prior to collecting the cuttings all the media was prepped and soaked a day before.

The placement of each treatment and media needed to be randomized for each flat. This ensures that placement of each trial in selected by chance and not choice.

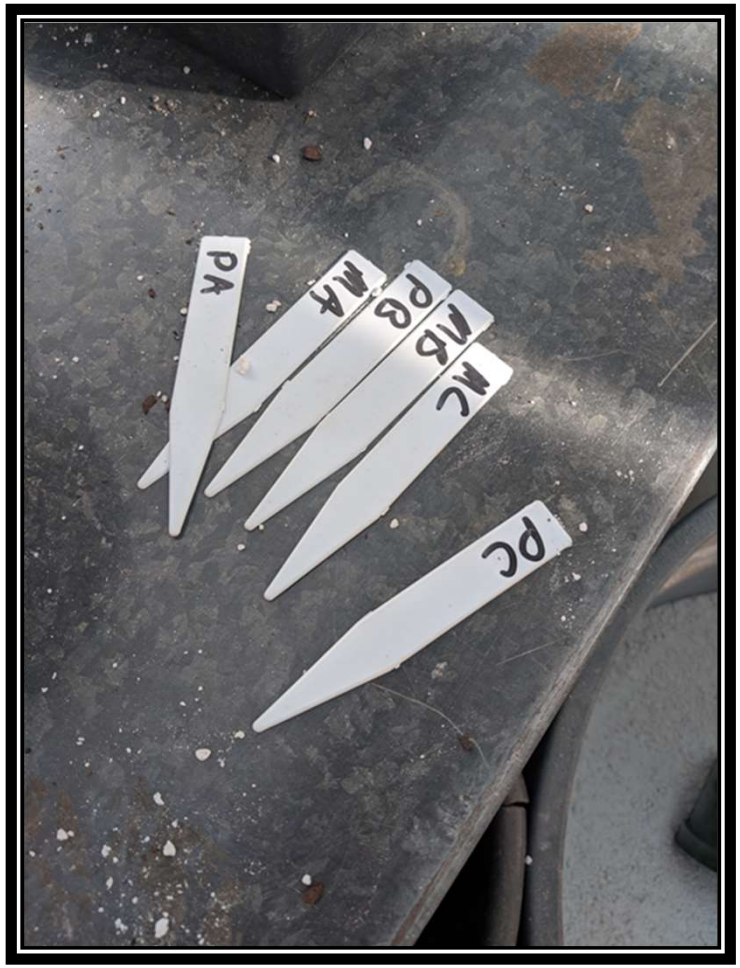
After the media and treatments were randomly selected each pot was filled with its designated media and labeled for what treatment was required.

The flats were then misted down and placed in greenhouse three over night.



TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

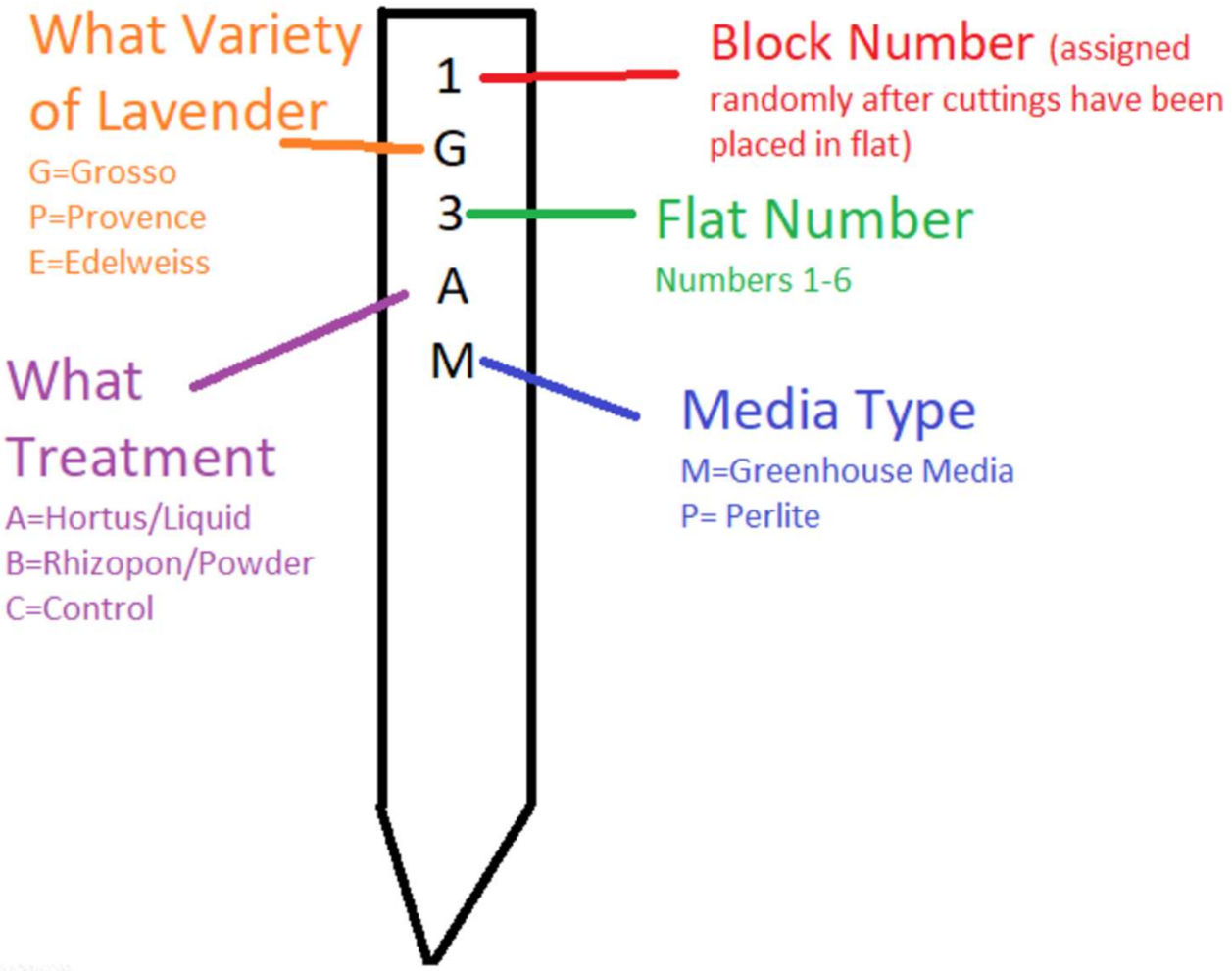
Randomization



Tags were labeled then placed in a bucket to be drawn at random for each flat.

TEXAS TECH UNIVERSITY
Department *of* Plant & Soil Science

Tags



TEXAS TECH UNIVERSITY
Department of Plant & Soil Science

Prep Cuttings

The buckets of cuttings were placed in the cooler while waiting to be processed.

Each cutting was cut to be roughly four inches to ensure uniformity. The bottom half was stripped of all leaves and then scarred on one side to help root formation.

The cuttings were then placed in a new bucket with water to help clean them off.

Treatments

Once the cuttings were ready they were then given one of the three treatments and placed in the designated media.

Treatment A-

Hortus IBA water soluble salts was used as a total emersion applications. Mixed with water at 800ppm the lavender cuttings were placed in the solution for 35 seconds.

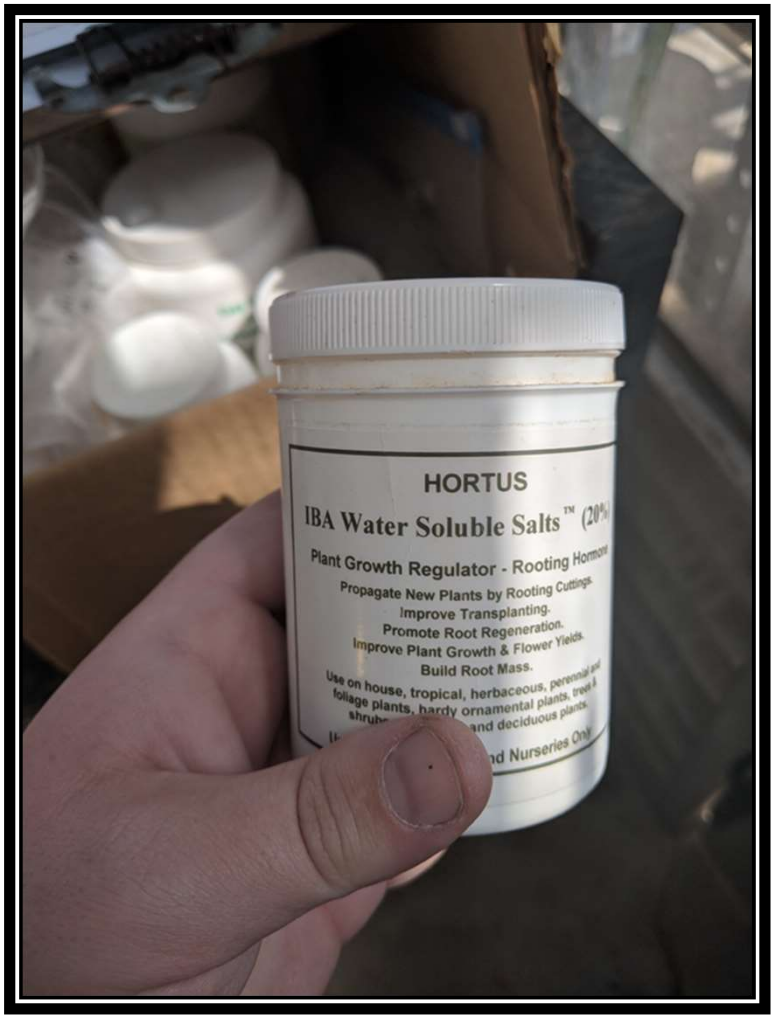
Treatment B-

This was the Rhizopon aa #3. Which is a powder that the bottom half of the cuttings are placed in. It acts with the plants natural rooting hormones to help the rooting process. #3 is specifically designed to aid with woody plants.

Treatment C-

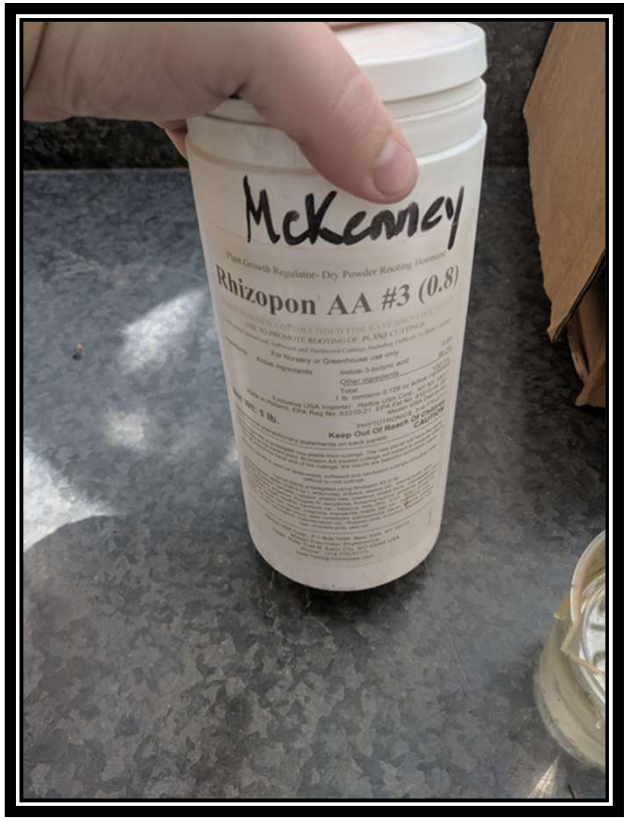
This was the control.

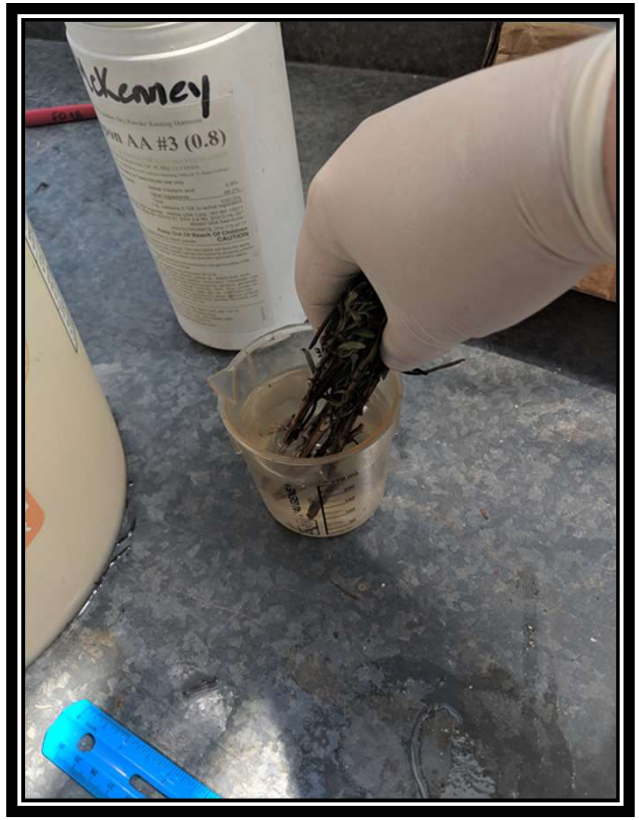
Treatment A- Liquid
Hortus IBA water soluble salts

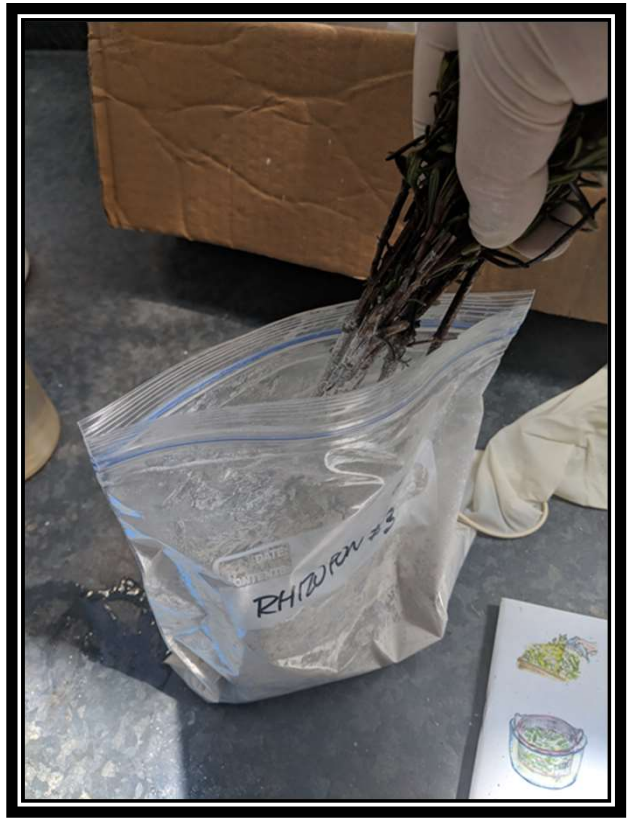


TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Treatment B- Powder
Rhizopon aa #3







TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Mist Bench

To ensure that the cuttings would receive an adequate amount of water without having someone come in to constantly water, the cuttings were placed on a mist bench.

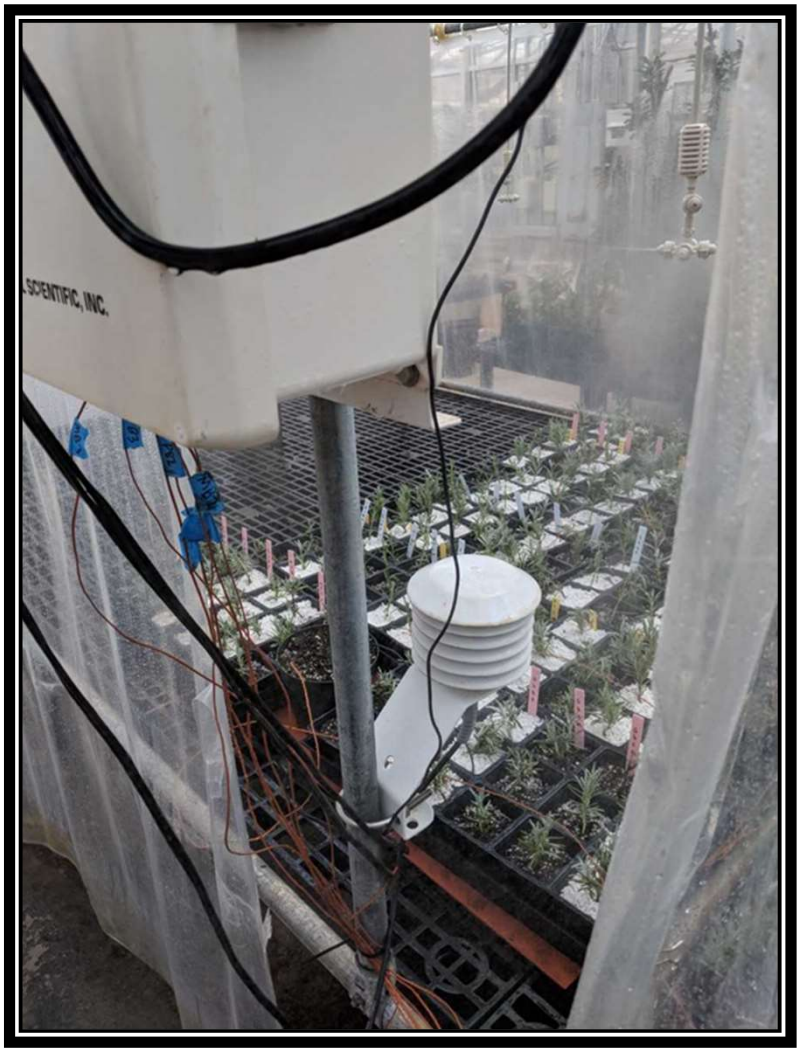
This system has multiple misting nozzles that hang three feet above the bench.

The mist system is controlled by a wet paddle that will turn on as the paddle dries. Currently the system at mid day is running every 50-60 seconds for roughly 7 seconds.

Bench Set up

In addition to the mist system there is also heating pads that are set to keep the flats at 80 degrees Fahrenheit. This will help stimulate root growth.

In order to collect as much data as possible there is also a moisture sensor, a temperature gage for soil and air, and a photo-sensor in place.

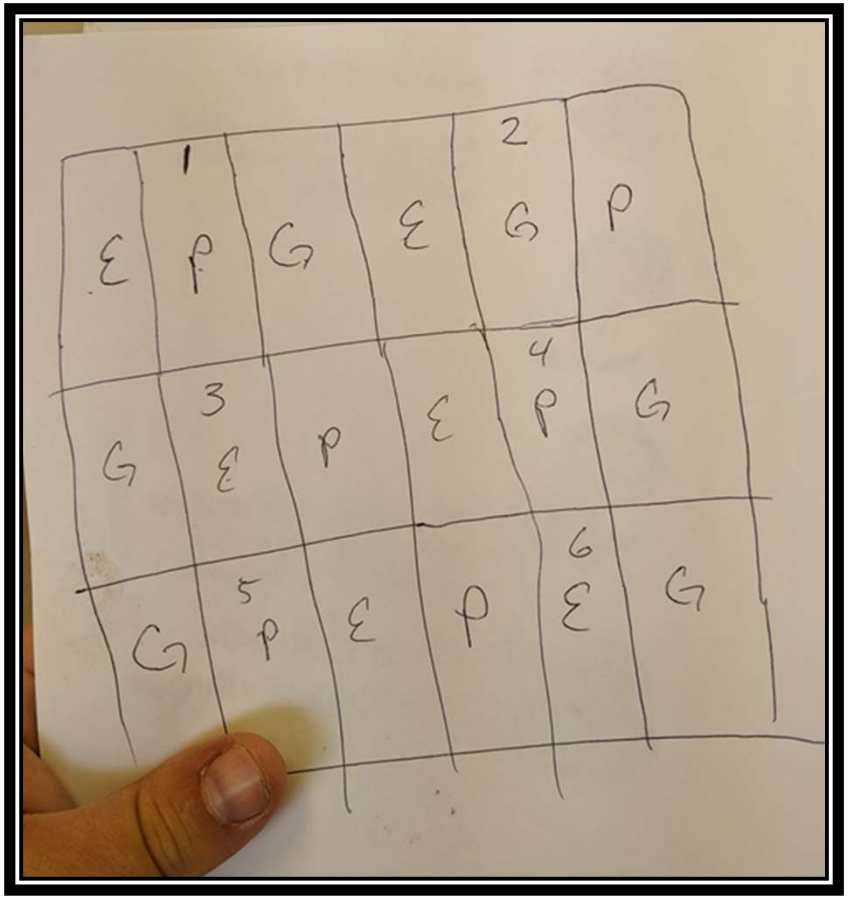


TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Bench Placement

The bench placement is divided into 6 different blocks with one variety in each block.

Placement of the flats in each block needed to be randomized. A similar method of randomization to the one used earlier was used to determine each flats placement.



Final Set Up

Collecting Data

Measured

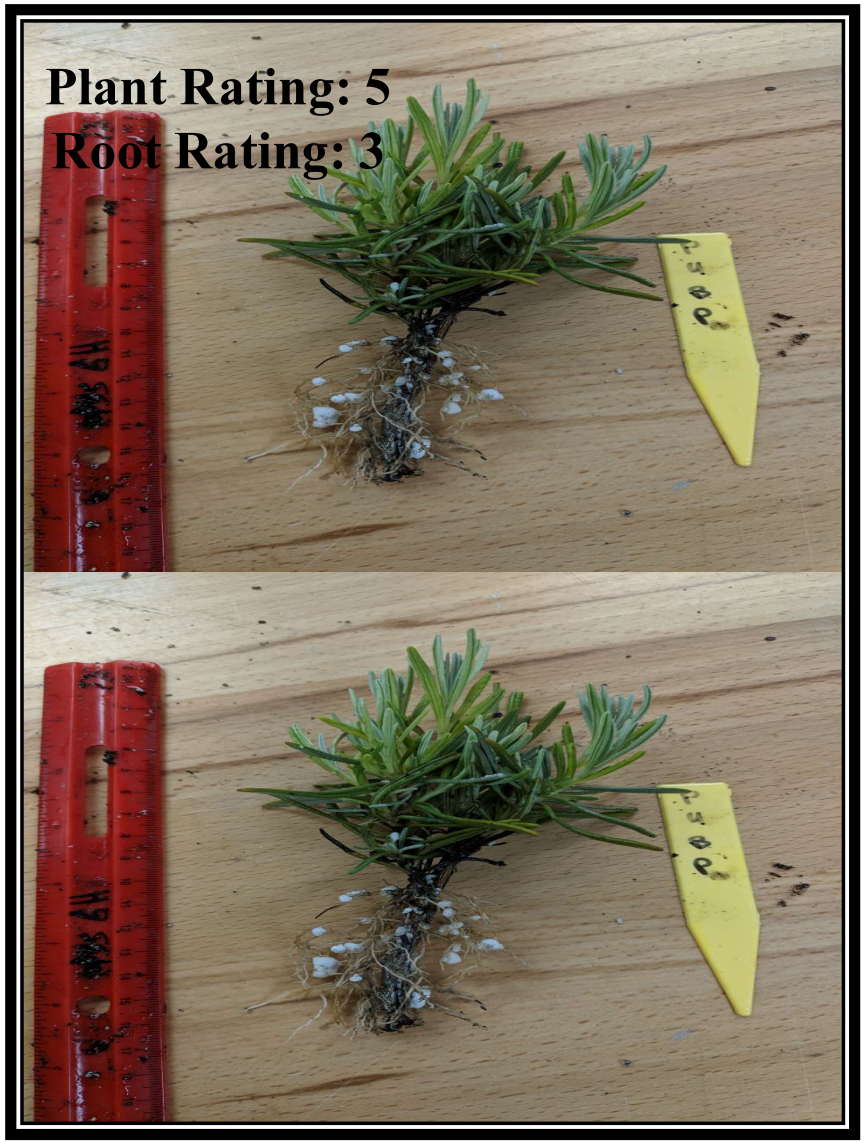
- Shoot length (new growth)
- Root length (longest root)
- Flower present
- Root rating
- Over all plant rating
- Number of roots

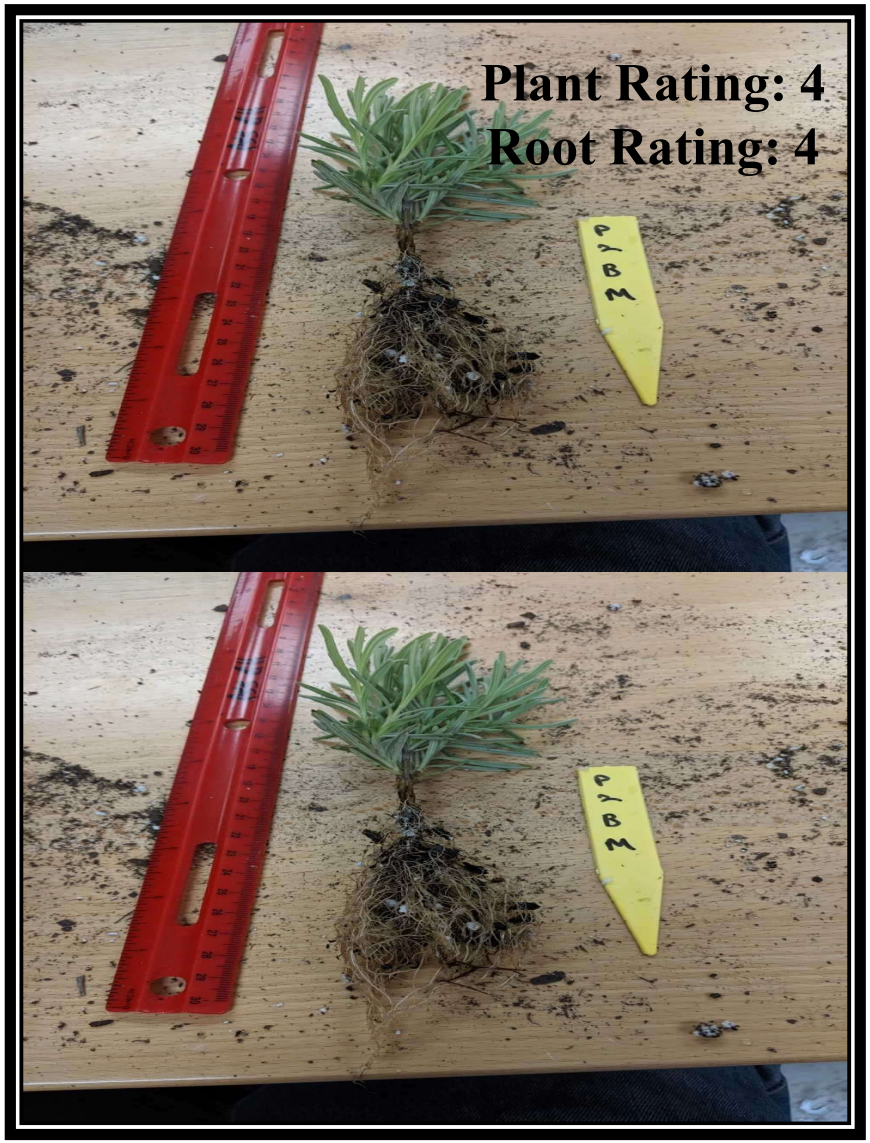
Plant ratings

Plants were rated on a scale of 1-5 with 1 being dead.
5- Lush, healthy, plenty of new growth
4- Healthy, less new growth
3- Showing signs of new growth
2- Still alive, but hasn't done much
1- Dead

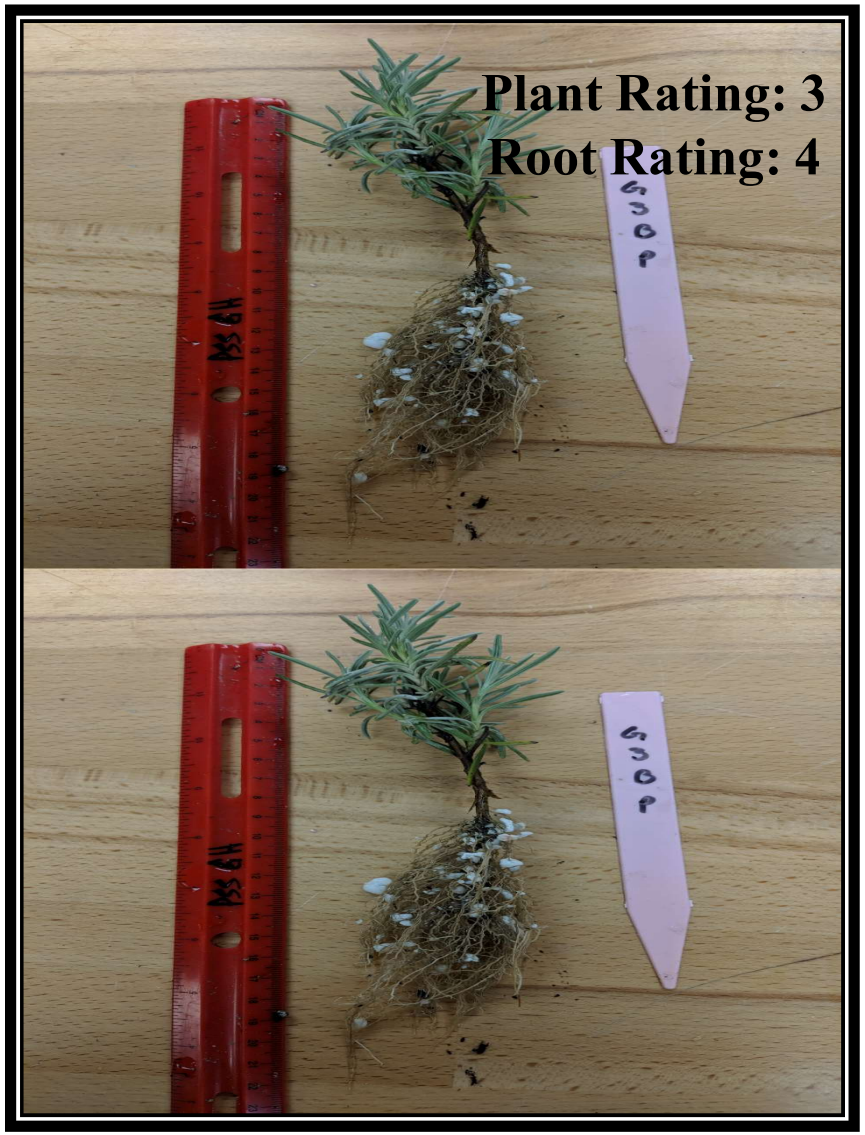
Roots were rated in a similar fashion.
5- Large amount of roots, healthy with a good sized root ball.
4- Not as large, but still healthy and spreading.
3- Good amount of roots, roots maybe growing in an undesirable area.
2- Has developed few roots
1- No root development/Dead

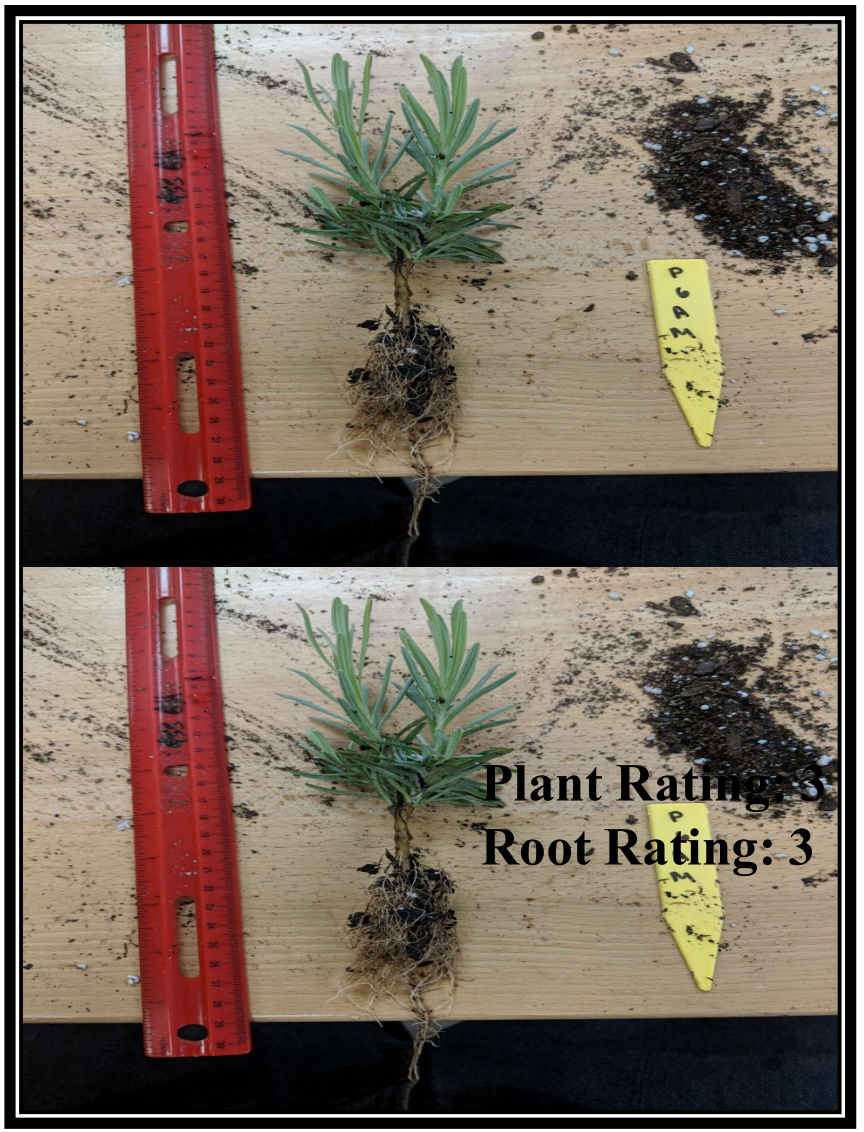
Plant ratings



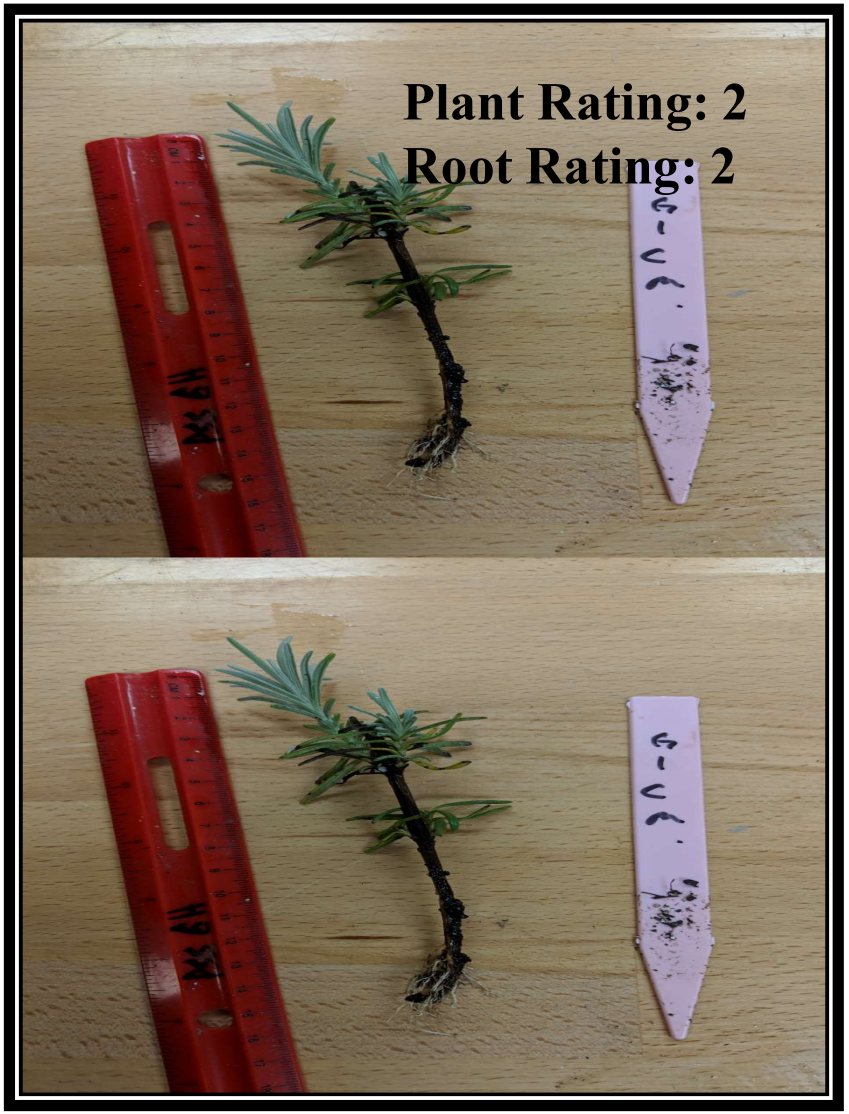


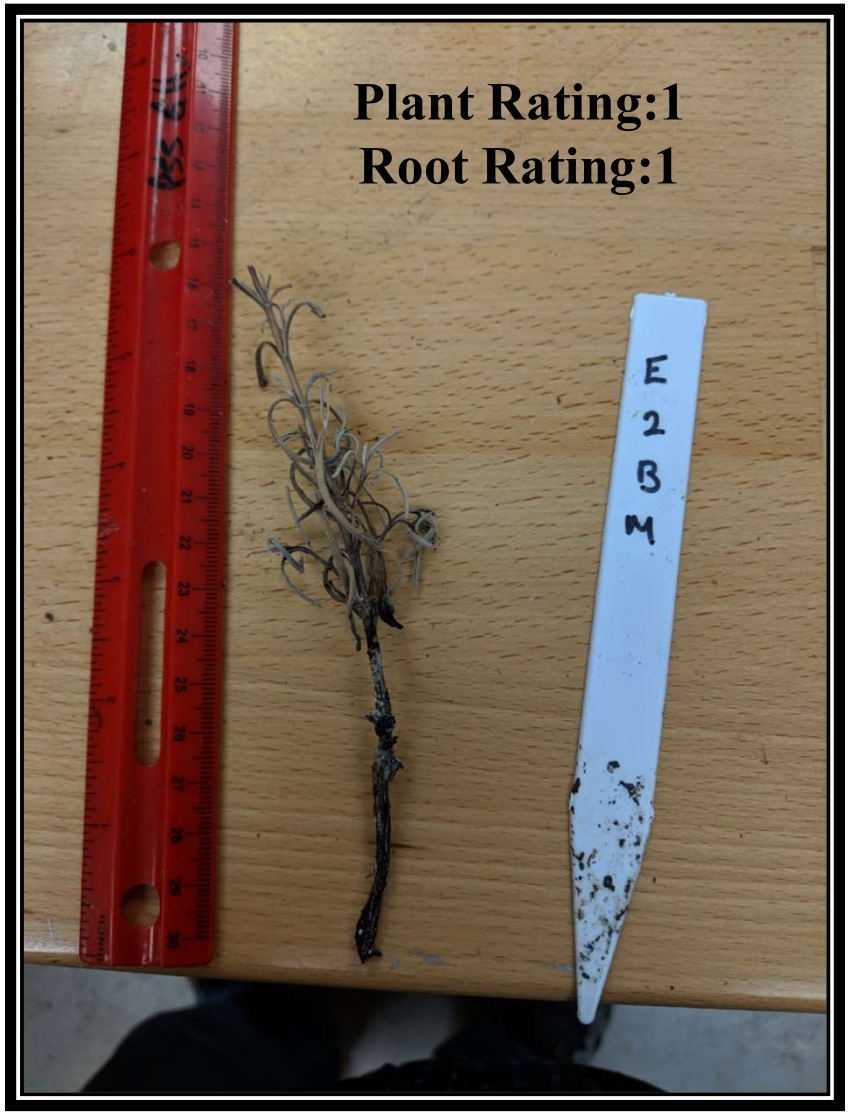
Plant ratings



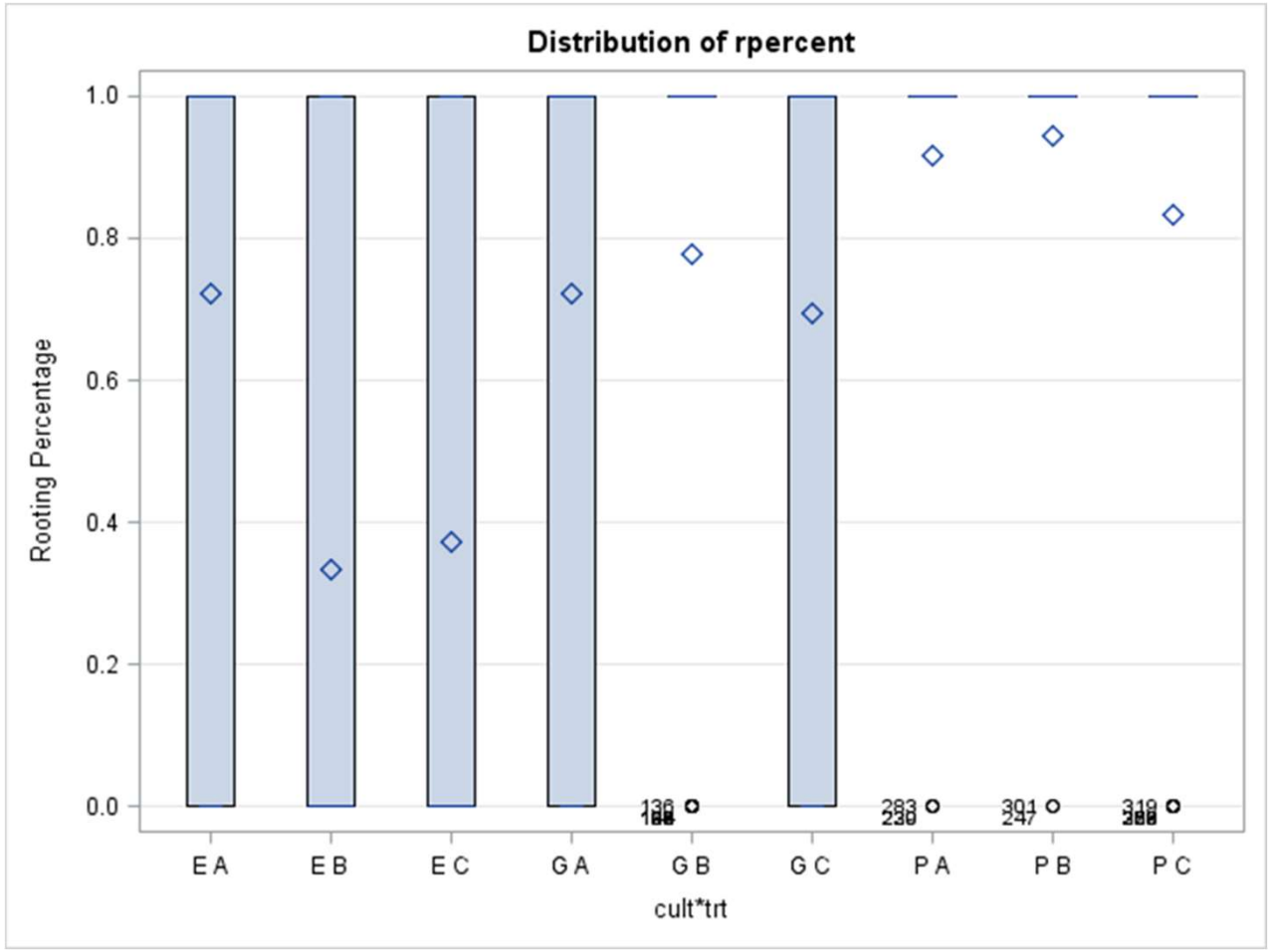


Plant ratings



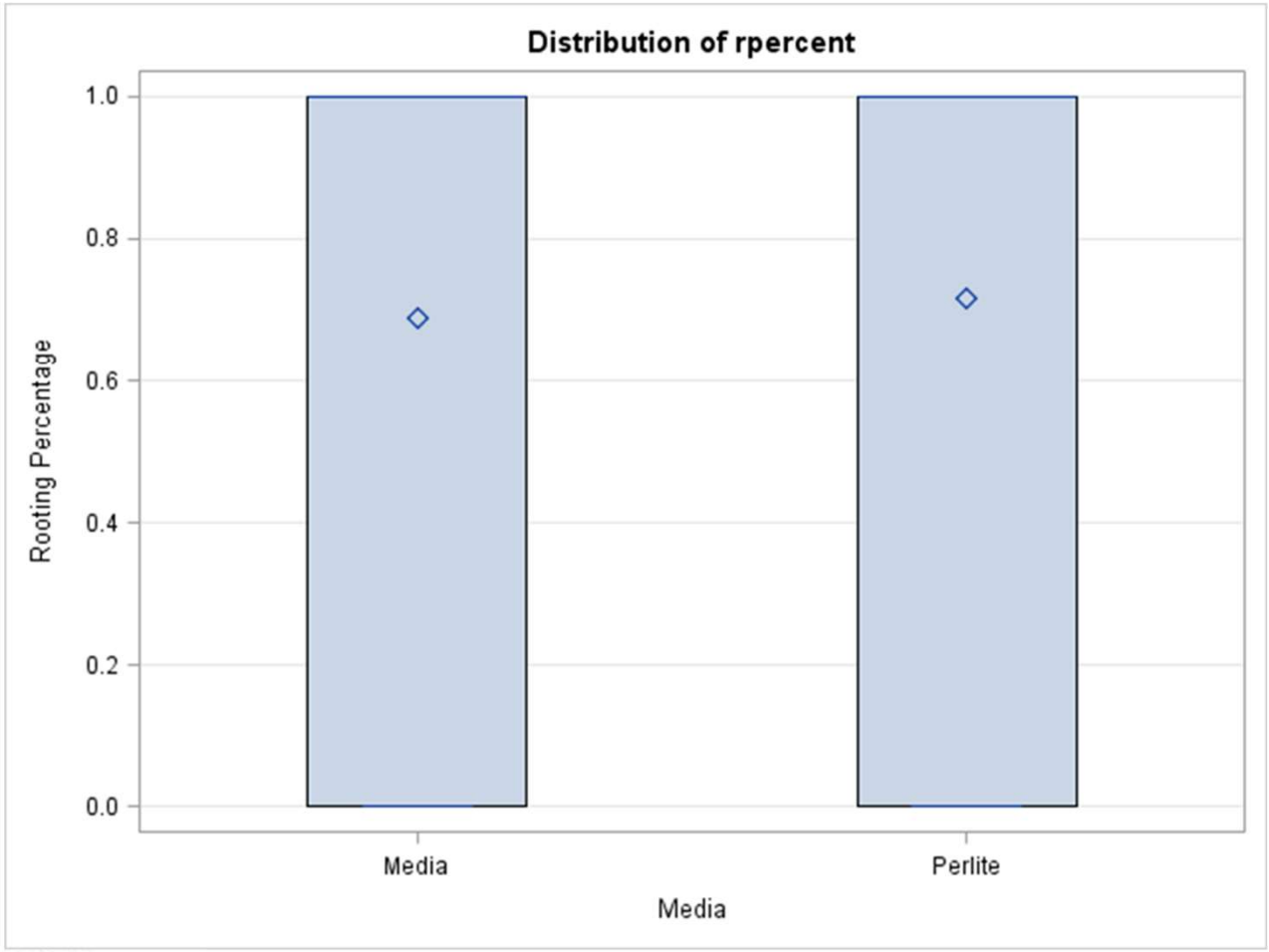


Results first trial

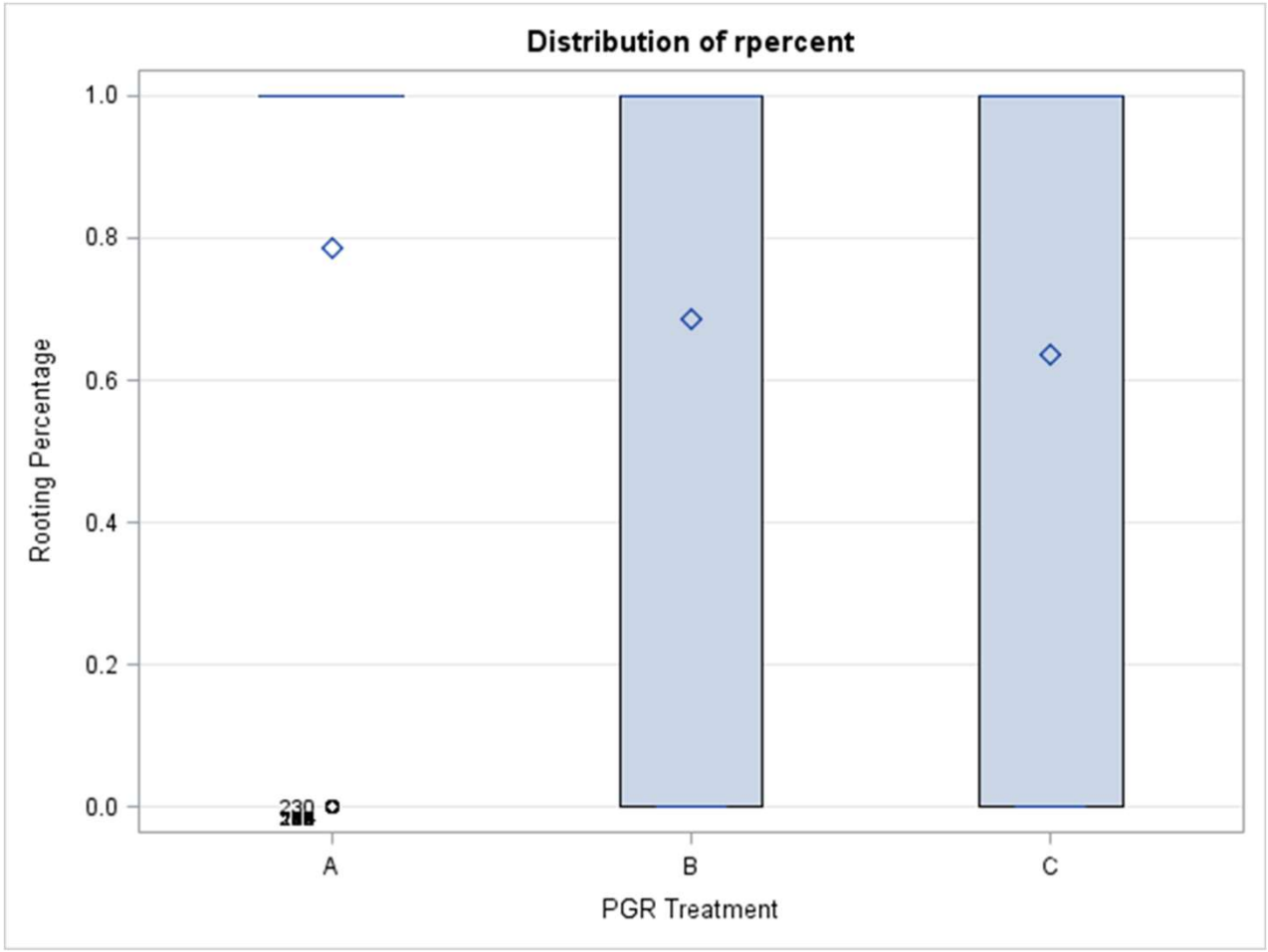


TEXAS TECH UNIVERSITY
Department *of* Plant & Soil Science

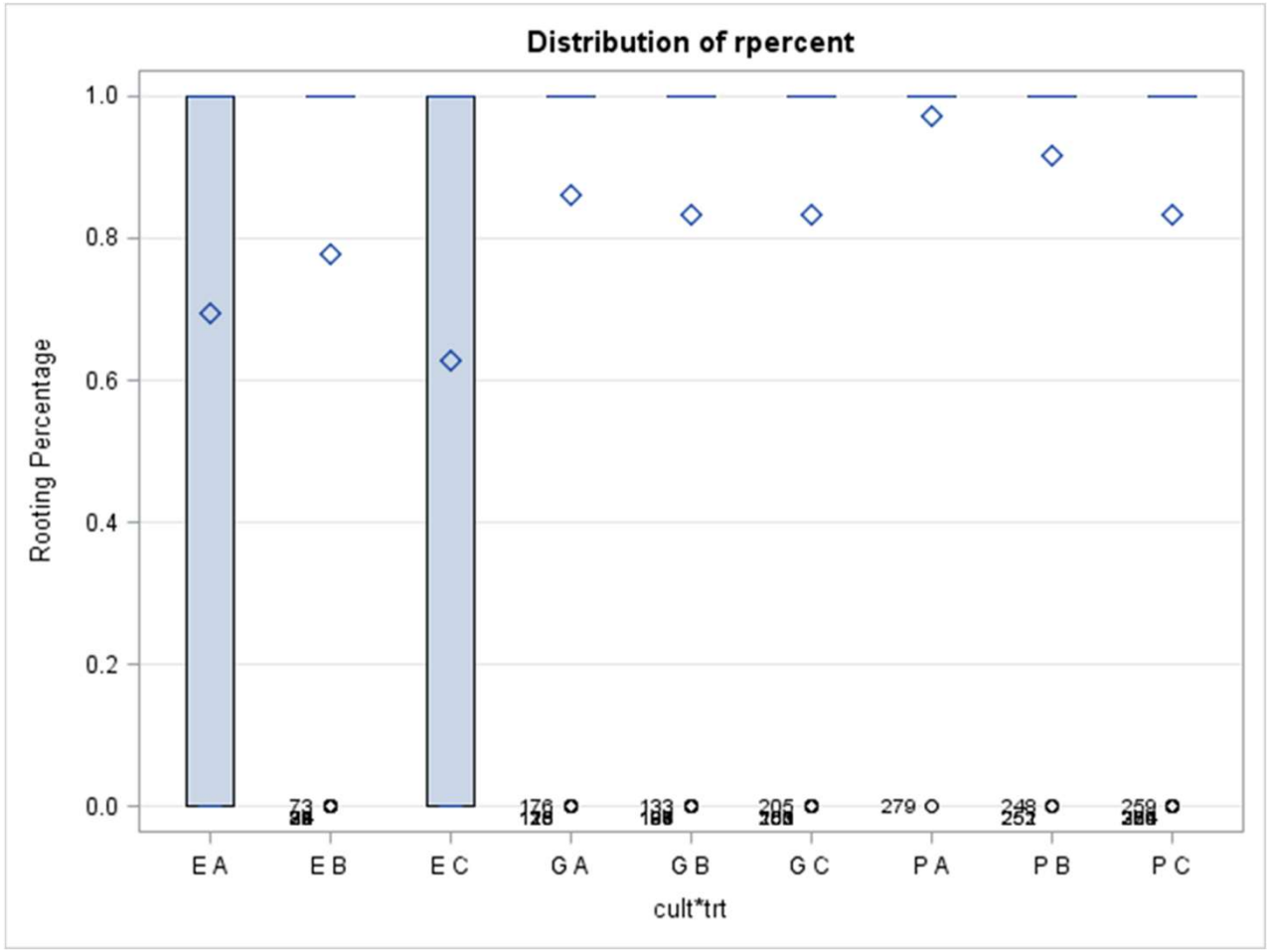
Media


Distribution of rpercent
Rooting Percentage
1.0
0.8
0.6
0.4
0.2
0.0
Media
Perlite
Media

Treatment

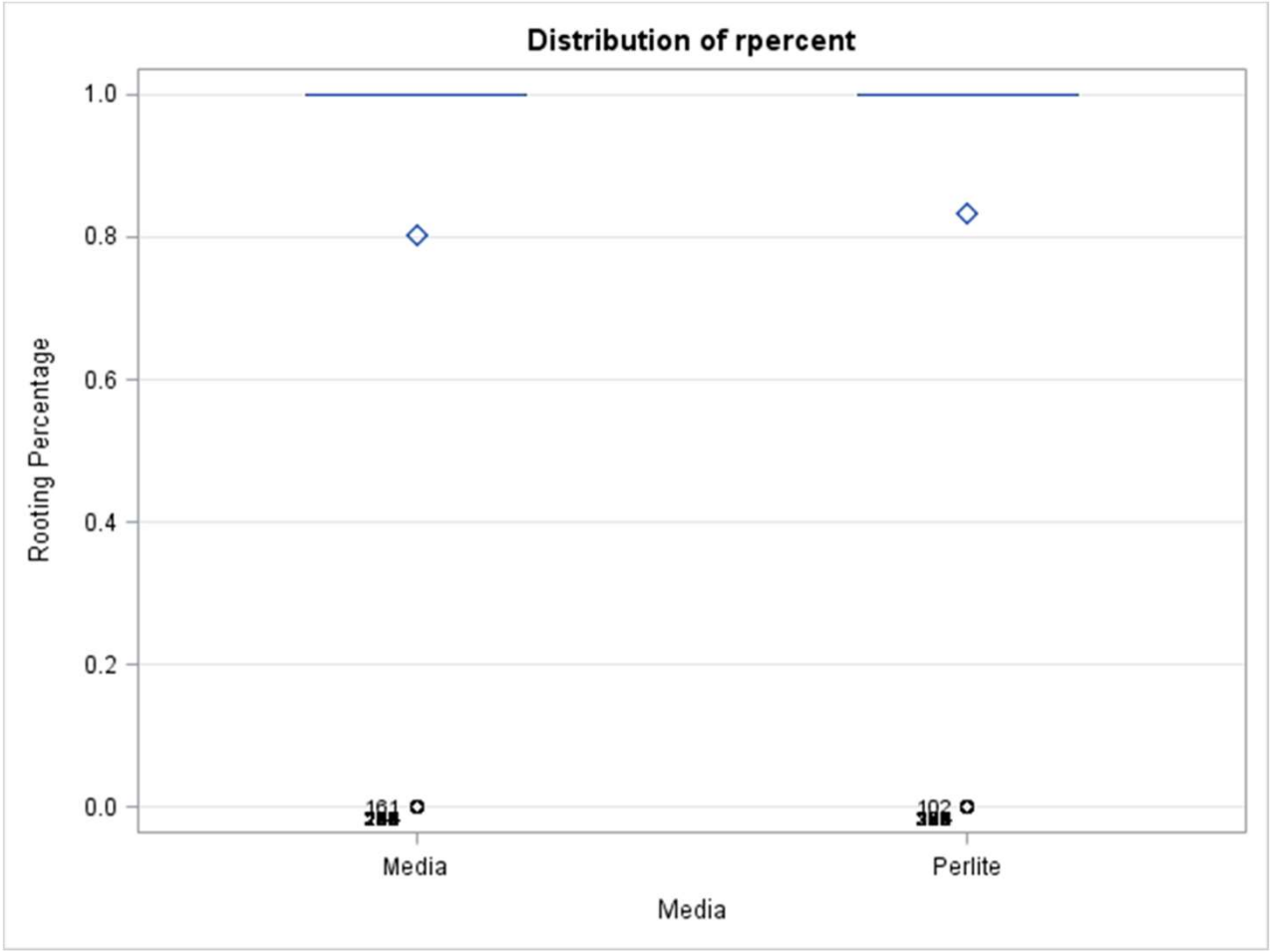

Distribution of rpercent
Rooting Percentage
1.0
0.8
0.6
0.4
0.2
0.0
230
A
B
C
PGR Treatment

Results second trial



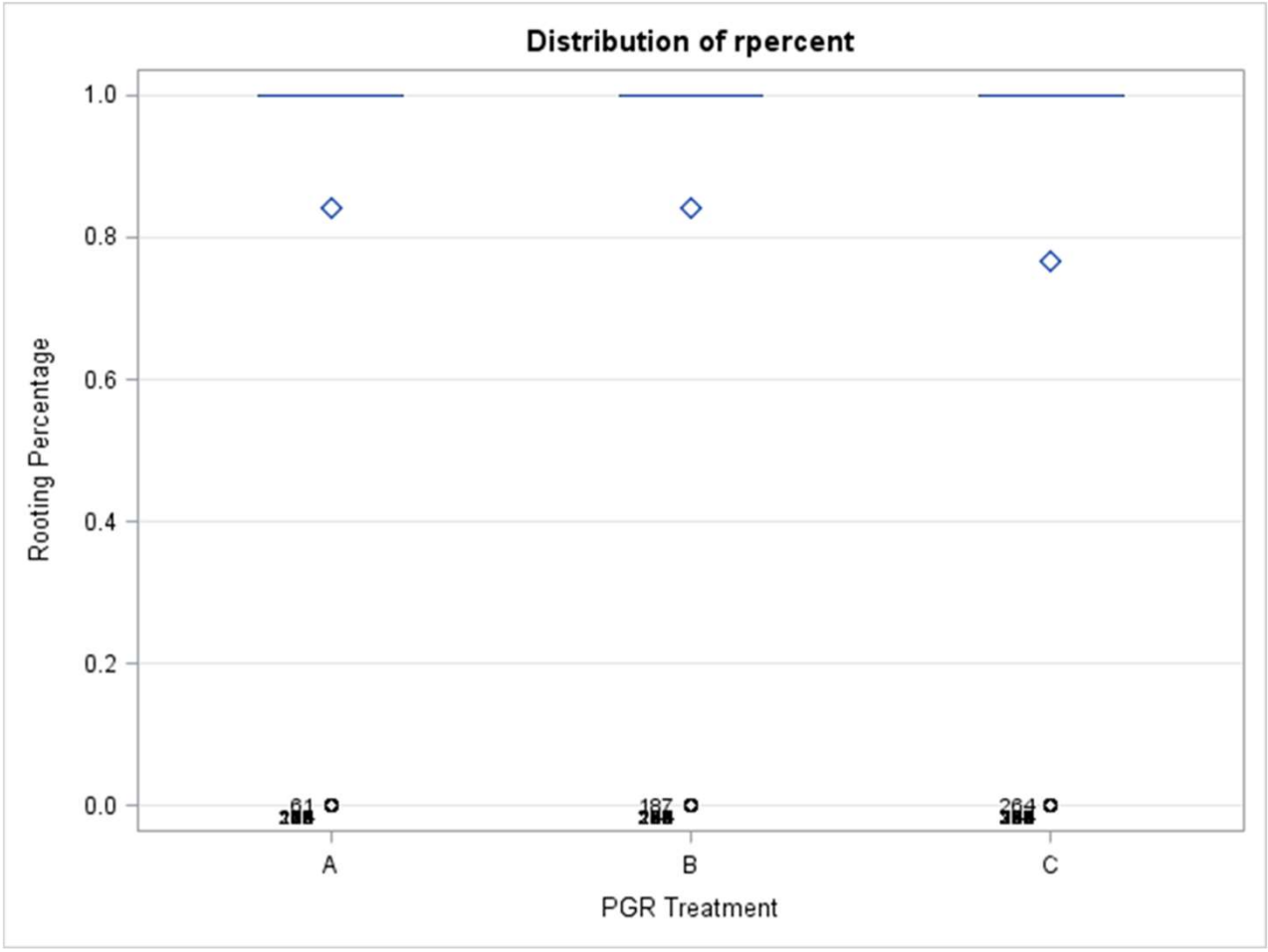
TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Media



TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Treatment


Distribution of rpercent
Rooting Percentage
1.0
0.8
0.6
0.4
0.2
0.0
A
B
C
PGR Treatment

What does this mean?

Although the data does not appear to contain any significant difference between the different variables, these results still contain useful information.

With this data we have learned that the difference in rooting between cuttings with rooting hormones and cuttings without is pretty minor. Knowing this lavender producers can save money when propagating lavender from cuttings.

TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

TEXAS TECH UNIVERSITY™

Lavender Research

Trial Selection

Derek W. Reed

Plant and Soil Science Department
Ornamental Horticulture Research Group
Texas Tech University

Fall 2018

What's Next?

To further lavender research in ground lavender will be planted at the greenhouse.

We will be planting 10 different varieties of lavender that will become our base crop. Cuttings will be made and propagated to produce more lavender for further research either at the greenhouse or at the TTU Quaker Farm in a more field like condition.

Main objectives will be growing practices, cost efficiency, & propagation methods

Why?

Currently there is next to no scientific data on lavender production.

Most of what can be found online is from backyard growers, and by word of mouth.

We with the data we collect we hope to find the most efficient way to grow and produce lavender to the benefit of all growers. This information will be backed by replicated scientific data.

Lavender Plugs

Looking at ten different varieties.

- **Grosso**
- **Provence**
- **Edelweiss**
- **Grappenhall**
- **Abrial**
- **Vera**
- **Munstead**
- **Hidcote Blue Giant**
- **Goodwin Creek**
- **Royal Purple**

Plug trays were ordered Monday July 9th and Tuesday July 24th. All plug trays were ordered from Mountain Valley Growers

MOUNTAIN VALLEY GROWERS

TEXAS TECH UNIVERSITY
Department *of* Plant & Soil Science

Plugs

All of the lavender varieties chosen are recommended in Zones 5-9, and should do well in Lubbock.

Most of the varieties chosen are from the hybrid Lavandin. There are a few varieties of English lavender, like the Munstead.

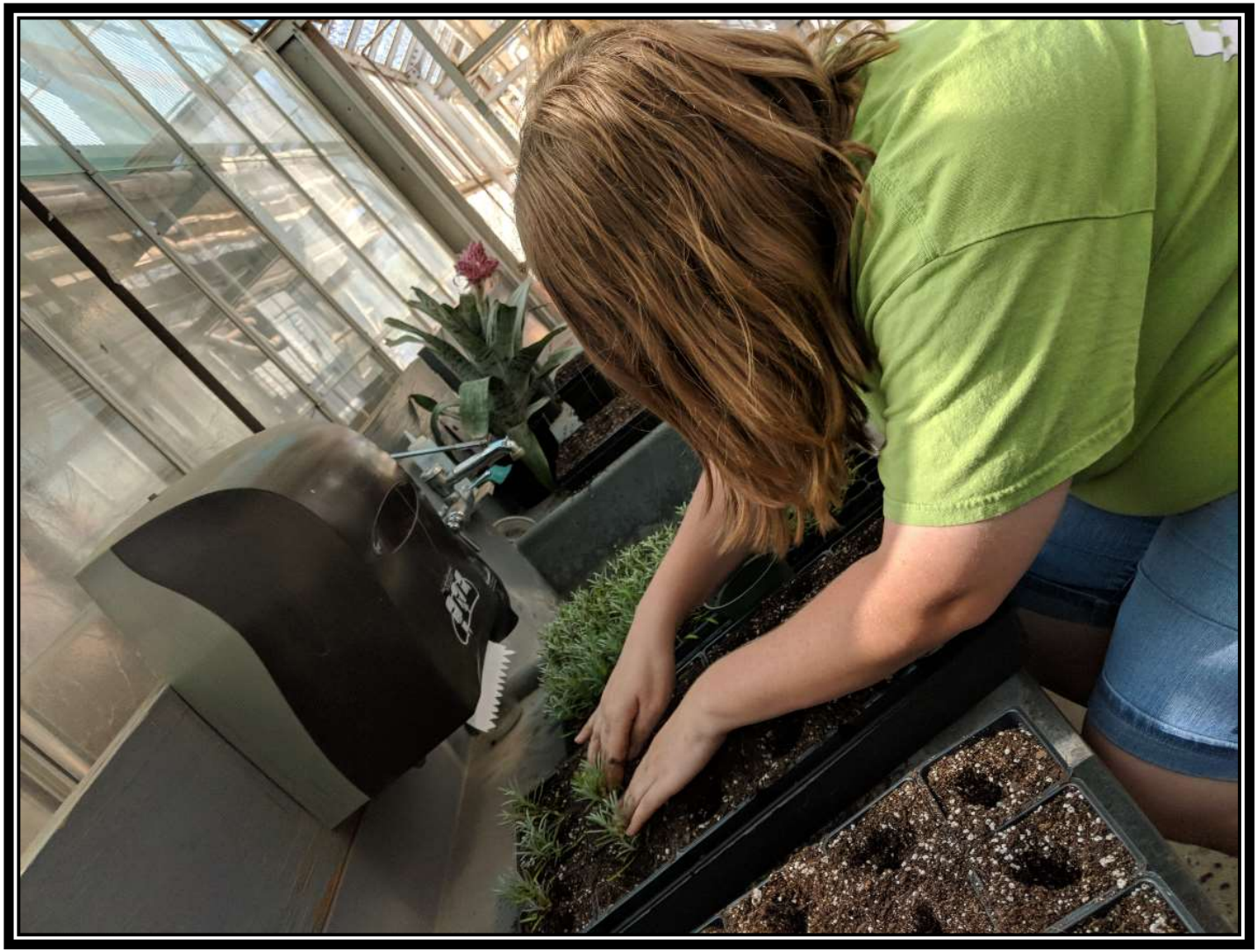
The plugs were flown in on two day shipping, and arrived in good condition.

Plugs

Once the plug trays arrived they were unboxed and placed under a mist bench for the weekend to help them recover from the shock of shipping.

After letting them recover they were then repotted into 4” pots to encourage root growth. Hopefully this will give the plants a chance when they are planted outside.

Plugs



Plugs

Lavender Beds

We are in the process of building new beds specifically for the lavender. There is an open area at the greenhouse next to the TTU research gardens.

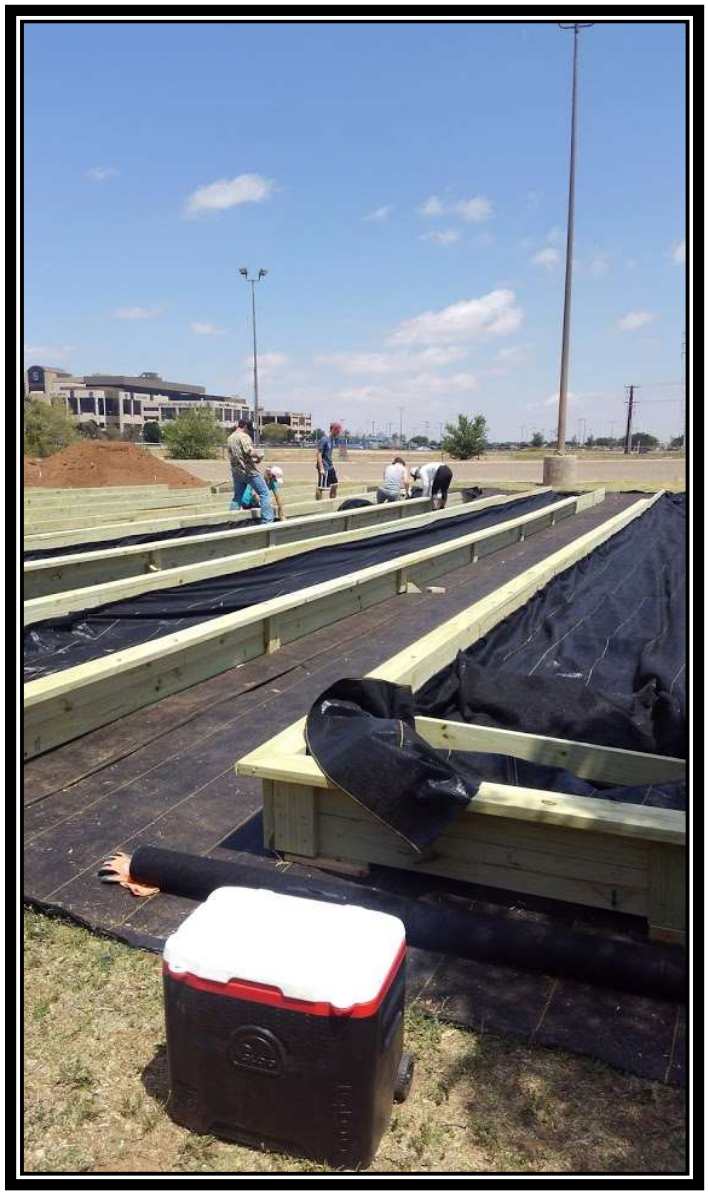
These beds will be 60’x4’ and there will be a total of 10. The width and number of beds may change.

They will be double lined with a weed barrier and the filled with local soil supplemented with cow manure.

Lavender Beds

TEXAS TECH UNIVERSITY
Department *of* Plant
& Soil Science

Lavender Beds



Propagation

We would like to continue our asexual propagation trials.

- **Would like to test out different container sizes**
- **Possibly test out other rooting hormones**

We would also like to test out seed growing of the lavenders we will be growing from the plug trays.

- **Wanting to see if this could be more cost effective.**
- **Can seed produce healthier plants?**
- **What is the time frame for seed growing in comparison to cuttings?**

Thank you

Thank you to everyone who has helped with getting this research to where it is today.

Would like to thank Beth Patterson for helping us get connected to the Texas Lavender Association and expressing so much interest in our work.

A big thank you to Danny Davis from Thistledew Lavender Farms for letting us come out and take cuttings from his plants.

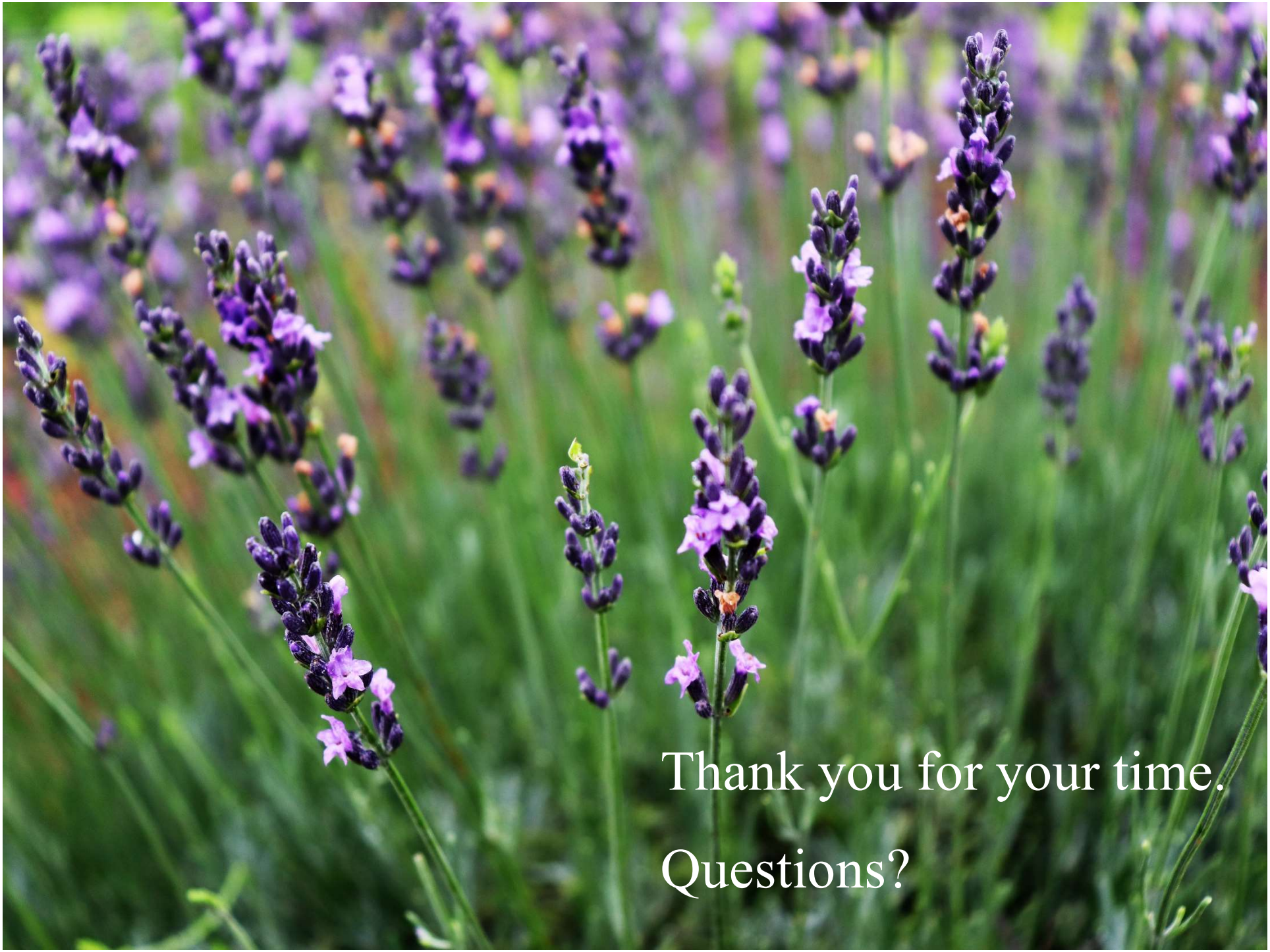
To Russ Plowman for helping me get my research going, and helping move it forward.

TEXAS TECH UNIVERSITY
Department *of* Plant & Soil Science

Thank you

Finally, a huge thank you to the Ornamental Horticulture Research Group for helping me take cuttings, plant, and collect data.

TEXAS TECH UNIVERSITY
Department *of* Plant & Soil Science


Thank you for your time.
Questions?