Western Regional Plant Introduction Station (WRPIS)
Horticulture Crops Program

Pullman, WA, WSU campus

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Summer

Company Overview

- Is part of the United States Department of Agriculture-Agricultural Research Service.
- They are partnered with Washington State University and are part of the US National Plant Germplasm System (NPGS).
- The WRPIS goals are acquiring, increasing, evaluating, documenting, and distributing plant germplasm of specific genera.
- The WRPIS is responsible for maintaining plant germplasm for 5,662 taxa from 1,126 genera.
- The major collections being food legumes, temperate grasses, beans, forage legumes, beets, lettuce, safflower, garlic, leek, onion relatives and miscellaneous other species.
- The seeds are logged into the NPGS computer database, called GRIN or Germplasm Resources Information Network.
- Then the seeds are kept in cold storage on the WSU campus at Pullman until they can be grown out for seed increase.
- Each increase is carried out so that the genetic variability of the original sample is preserved while preventing gene flow from one accession to another.
- Germplasm users are anyone who has ever planted a crop or home garden.
- The job of the station is to maintain a gene bank for present and future plant breeders to use in developing the varieties. This includes maintaining the quantity and quality of seed for this research.

Greenhouse work

- Most of my work in the program revolved around beet accessions.
- Then we transplanted them into pots to stay in the greenhouse
- I helped maintain the plant's health with general upkeep such as watering, re-potting them if necessary, adding fertilizer, removing dead leaves and harvesting seeds.

Type of *Allium* and beets

Beets in a wire mesh to collect seeds

Fully healthy lettuce

Lettuce with leaf tip burn caused by watering on leaves

Taraxacum

Full grown *Salvia*

Salvia that was pruned

Everyday tasks, filling pots and washing equipment.

All the pictures above are show the various rooms and crops , beets, lettuce, *Salvia,* and *Taraxacum*, in the primary greenhouse used by the Horticulture crops program.

Lab work

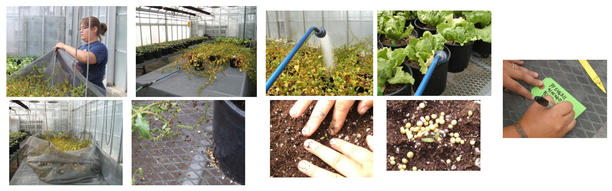
- I helped get them started from seed by using a sterile germination protocol and decorticating them.
- Every beet plant grown was sampled for DNA extraction and ploidy analysis, by plucking a young leaf off the plant and storing the tissue in a freezer for later testing.
- Obtaining the weight of seeds, full bag weight and 100 seed weight is a tool used to obtain seeds quickly, from the seed bank at a later date.
- I was able to help collect tissue samples from the leaves of the lettuce by using a hole punch, very interesting technique but very effective and efficient. The tissue samples were then tested using the ELISA protocol to check for viruses, specifically lettuce mosaic virus.

Obtaining full bag seed weight.

Obtaining 100 seed weight.

Decorticating beet seeds.

An important sigh used to show when pesticides use on the plant, room or field.



Shows the making of and unction of the wire mesh structures, catching seeds.

Plant up keep and the proper way of watering lettuce.

The hallway of greenhouse five. Shows one of the cultural practices used to prevent pest and pollination contamination by the use of lab coats.

Lettuce that has bolted and is producing seed.

Evaluation and documentation of beet plants.

All the pictures above are the rooms and crops, lettuce and beets, in a secondary greenhouse used by the Horticulture Corps program

Shade house used to harden off plants before planting in the field.

Another greenhouse, "Bubble house" used for extra growing space.

Field work

- Some of the beets that were put into the field are only for evaluation purposes.
- The data collected from these plants are plant diameter, primary stem diameter, number of main branches protruding from the primary stem; type of branching (secondary, tertiary, and quaternary), first flower date and the date of the first ripe seed, any morphologic characteristics that seem different or unusual.
- This helps to identify the accession in the future.
- To harvest garlic we had to shovel out the garlic bulbs, without slicing into the bulb, from really hard ground.
- Some crops are grown in the greenhouse and out in the field inside screen tents- lettuce, leeks, and *Taraxacums*.
- The tent's main purpose is for accession isolation to maintain genetic integrity of each accession.
- They also help keep pests, such as deer, away from the crop as well as preventing the wind from blowing away all the seeds.
- The tent also keeps the pollinators, flies in this case, inside the tents.

One of many of the farms used by the Horticulture crops program.

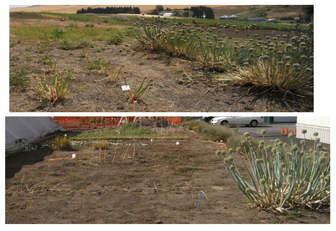
The seed house is where the seeds are cleaned and dried. It used for all seeds, weather they are coming from the greenhouse or the field.

Garlic harvesting

Taraxacums inside a tent structure.

A structure built at South Farm to protect beets and to help isolate them from cross pollination.

Another farm used to grow beets, which are surrounded by a fence for protection. Can also see the use of a water truck.



Two perennial gardens that are used for seed increase as well as documentation.

Maintenance of one perennial garden.

Beet seed harvesting

Leeks inside tents being evaluated.

Beet being evaluated.

The above pictures were taken at another farm in Central Ferry.

Pollinators "Fly Bags"

- This required measuring out chilled fly larvae usually 150-200 larvae per bag.
- They were premeasured to give the same approximate amount of flies every time, 150 pupae is equal to 8.3 grams and 200 pupae is equal to 11 grams.
- After the flies are measured out and put into paper bags and stapled shut they are left out at room temperature to hatch.
- Once buzzing in the bag is heard they are ready to be set loose inside the screen tents.
- Keep them in a cool place if traveling a long distance or being out in the heat for a long period of time as they will die.

The pictures above show flies being released into a tent containing leeks.

Summary

I learned so much about several different aspects of the germplasm maintenance such as harvesting from various genera and species, collecting tissue samples for testing, collecting data, growing plants and maintaining plant health, and even using pollinators that I wouldn't have expected. I was able to see a lot of various class principles and themes used in a real work setting and was able to get a hands on approach to those lessons that I wasn't able to before. I feel that my internship really solidified a lot of the lessons I learned in class and added to my knowledge base. I plan to continue working for the USDA until I leave Pullman.