

Identification of Novel Genetic Markers for Drought Tolerance in Wheat

Washington State University's Smertenko Lab

Austin Lenssen, Spring 2018

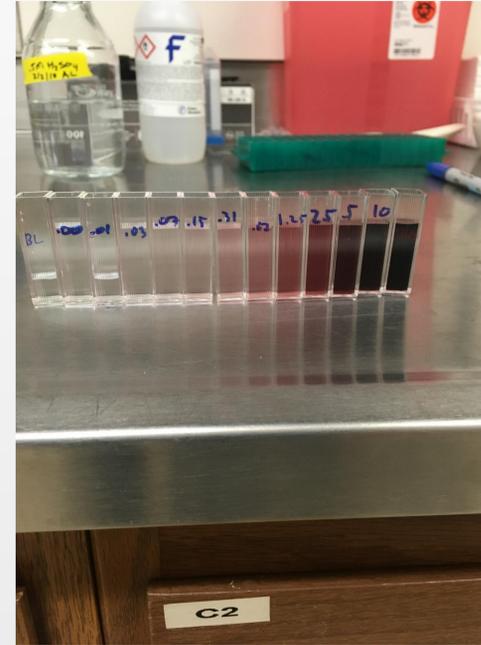


Introduction

The Smertenko Lab is located in Pullman, WA at the main campus of Washington State University. The Smertenko Lab is run by Andrei Smertenko and his wife, Tania. The lab does several cellular level research on Wheat, Arabidopsis, and Brachypodium. Their goals include increasing the productivity of wheat plants by identifying genetic markers that wheat breeders can incorporate in their breeding programs.



Taking stomatal conductance of wheat plants in experiment (left) with the leaf porometer machine (right)



Creating Hydrogen Peroxide Assay Standard Curve (one of the lab tests I was responsible for running)



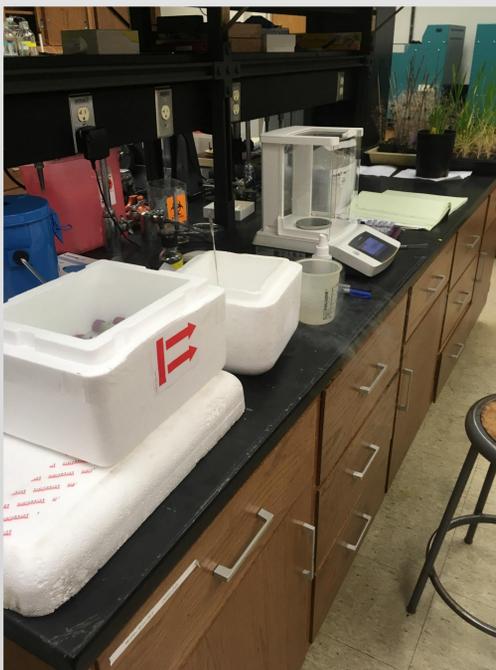
Spectrofluorometer, the piece of equipment that measures absorbance of various assays I ran

Professional Growth and Development

Through this internship, I have acquired many skills that have made me a more well-rounded individual. The most important thing I learned through this internship was time management. I had to carefully plan out every day between classes, what I was to do at my internship, studying and other things I had to do that given day. Sometimes, it was hard to map out my day. So, I would come up with a rough idea, and it would change because I tried to remain as flexible as possible. I also increased my communication abilities through online forms of communication with co-workers and my mentor such as e-mail, oral presentations, and communicating with those whose first language was one other than English.

Responsibilities

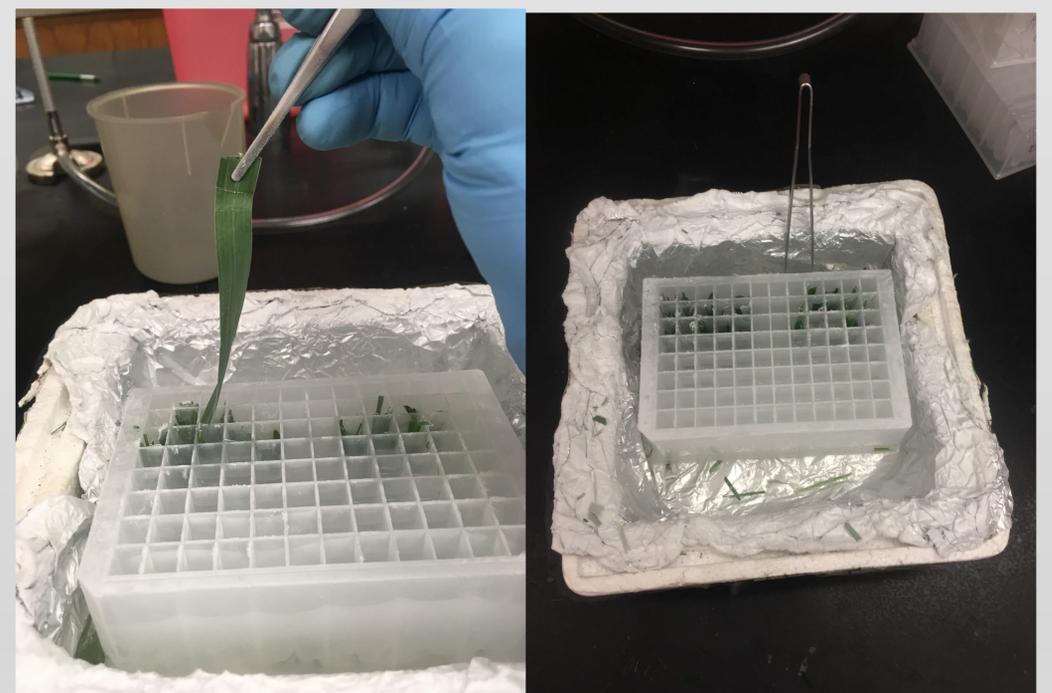
I had several responsibilities through my internship; however, my main responsibilities were to do tasks that assist in identifying genetic markers that would increase drought tolerance in wheat. The main experiment I was involved in was testing out three different cultivars of wheat known to fair well under drought conditions. We put the plants in a controlled phenotyping room and began the drought until there was no moisture left in the soil, which took 9 days to accomplish. We took several measurements from the plants every day of the drought. After that, I was then responsible for engaging in routine lab techniques such as creating buffers, practicing safe lab techniques, and following procedures for lab tests. I also helped collect data from the drought stressed and control plants in the experiment. I was to run multiple assays on leaf tissue, extracting protein from wheat plants using homogenization, and measuring quantities of peroxisomes. Then, I was to evaluate and analyze all collected data and present the data that was collected from the experiment.



My lab bench on an average day of running tests



Phenomics room where experimental measurements and drought took place



Filling 96 well plates for the peroxisome assay.