INTERNSHIP AT THE WSU TREE FRUIT RESEARCH CENTER

Orlando Howe, Lab Technician, Spring 2021
WSU Tree Fruit Research Center Extension, Department of Tree Fruit Physiology, 1100 N Western Ave, Wenatchee, WA 98801

WASHINGTON STATE UNIVERSITY

INTRODUCTION

The WSU Tree Fruit Research Center is located in Wenatchee, WA and was founded in 1940. This extension center continues to serve the community and provide growers with information for sustainable fruit production. The center also provides opportunities for graduate students to earn a masters or doctorate degree through various research programs such as plant breeding, entomology, pathology, and physiology.

Dr. Lee Kalcsits, an assistant professor at WSU TFREC, supervises the plant physiology program and was my mentor and supervisor for this internship.

The focus of this plant physiology lab includes:

- Tree fruit physiology
- Abiotic stress
- Plant nutrition
- Impacts of preharvest environment on postharvest physiology

RESPONSIBILITIES AS A LAB TECHNICIAN

- Help graduate students with miscellaneous tasks
- Pruning
- Thinning
- Bud count in the spring
- Maintenance work in the field and greenhouse
- Data entry
- Take physiological measurements in the field
- Prepare isotope samples
- Prepare samples for the MP-AES
- Analyze fruit quality and collect data
- Organizes and maintains a clean workplace in the lab
- Organization of test tubes and storage units containing samples

Figure 1.1
WSU-TFREC Sunrise Orchard
This is an experimental orchard that consists of apples and pears. This location is currently being used as experimental blocks for various programs. This picture was taken by me in March 2021.

FIELD WORK

Field work in the late winter/early spring consisted of pruning. Pruning is important to control vigor and to control fruit load per tree. During the internship, fieldwork consisted of pruning a Cosmic Crisp block and Honey Crisp block.

Figure 1.2
WSU-TFREC Sunrise Orchard
This is a photo was taken by me in April 2021. In the tree you can observe faint white flowers that will later produce fruit. Another observation is the number of leaves produced in one month in comparison to Figure 1.1 taken in March of the same year.

LAB WORK

Scientific lab work during the internship included the preparation of isotope samples, and the preparation of samples for the MP-AES machine. Both projects were extensive and required many samples to be prepared and analyzed. All work must be done correctly and efficiently because of the large quantities of samples for each project and to ensure accuracy and validity of the data.

Figure 1.3
This is a photo of the scale that measures the isotope samples. Each sample must be measured in between 2.9-3.1mg. The total number of samples exceeded 600.

Figure 1.4
This photo is part of the procedure of preparing samples for the MP-AES. The photo left is a pipette measuring 200 microliters from a sample. The photo right is the transfer of 200 microliters into 800 microliters of deionized water. Because the sample was diluted into nitric acid, all work was under a fume hood. Protective wear such as nitrile gloves, lab coat, and eye wear was worn.

IMPORTANT SKILLS AND CONCEPTS I LEARNED

- How to create excel tables and consolidate data
- Take thorough notes
- How to prune different styles of apple trees (single, double, and triple axis)
- How to prepare an isotope sample
- How to prepare samples for an MP-AES
- General lab protocol
- How to identify lenticel break down and bitter pit and other physiological disorders.
- Physiological concepts behind thinning and pruning
- Physiological concepts behind heat acclimation, water deficit irrigation, and nutrient uptake in the roots
- Utilize different instruments to measure stem water potential and stomatal conductance and chlorophyll fluorescence

OVERALL EXPERIENCE

My experience working at the WSU Tree Fruit Research Center was very positive. Dr. Lee Kalcsits was an excellent mentor and supervisor. Expectations and directions were always clear and concise. Working in the lab was an excellent opportunity and encourages me to pursue higher level education. The graduate students were welcoming and amicable and were an excellent resource for any questions concerning homework and graduate school. The overall environment of the lab was encouraging and respectful of one another. I enjoyed going to work to learn more plant physiology and about lab procedures for different experiments. This job opportunity intrigued my curiosity as well gave me insight on what it takes to be a graduate student.