

Research Final Report
**Oregon State University North Willamette Research and Extension Center Nursery
Production Internship**
for
**OREGON DEPARTMENT OF AGRICULTURE
NURSERY RESEARCH AND REGULATORY COMMITTEE**

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Oregon Department of Agriculture and Oregon Association of Nurseries Nursery Research 2013

Date: December 31, 2013

Title: Oregon State University North Willamette Research and Extension Center Nursery Production Internship

Background

The North Willamette Research and Extension Center internship is an ongoing educational program that immerses undergraduate and post-baccalaureate students into a multitude of nursery related projects and experiences. Interns have been from local (community colleges and universities), regional (California, Washington, Oregon), national (Rhode Island, Minnesota, Illinois) and international (Europe, Asia, South America) locations.

Internships allow the North Willamette Research and Extension Center to obtain skilled personnel necessary to execute detailed and labor intensive nursery and Christmas tree research projects. The students gain aptitude in nursery related tasks as well as in research skills that include oral presenting, writing, data collection, entry and analysis, as well as writing, and critical thinking. In turn, the internship program allows the North Willamette to obtain skilled personnel during the prime research season. Interns will also gain experience and knowledge that can help place them in nurseries or related industries in the Pacific Northwest.

We are dedicated to exposing students to the Oregon nursery, greenhouse and Christmas tree industries. Therefore, the opportunity to tour nursery facilities as well as assist with on-site nursery research and extension is highlighted, giving the students a chance to interact with industry members and view different organizations, providing a better understanding of nursery and Christmas tree production.

During the course of the internship, the student will develop and carry out an independent research/extension project allowing him or her to focus on a specific topic of interest. This project allows them to gain insight into challenges facing nurseries as well as gain aptitude in research protocol. If possible, the student will also demonstrate their project to the industry at Nursery Research and Extension Faire as well as other venues, ensuring their research is disseminated while giving them experience presenting to groups.

Recent interns have lead or participated in the following projects:

- Organic floriculture production
- Wireless irrigation monitoring
- Shade tree soil fertility
- Nursery tailwater bioremediation
- Controlling plant height using plant growth regulators in Christmas and shade trees
- Slug control in Christmas trees and nursery
- Control of rooting out in pot-in-pot production
- Collecting plant germplasm for breeding and evaluation.
- Microbiology techniques applied to isolate and culture plant pathogens.



For 2013, existing and potential projects may include:

- Evaluating aerial inventory technology, best management practices and insect control efficacy for plant exports
- Evaluating honeylocust pod gall midge management options
- Christmas tree progeny evaluations for Nordmann and noble Fir
Isolation and characterization of *Pythium and Phytophthora* spp from greenhouse and Nursery crops production systems.

For this internship we are seeking a student who is studying horticulture or plant science and is from a university or college in the U.S. or Canada. A student will be hired on OAN/ODA grant funds and work full-time for 3 to 4 months in 2013. Preference is given to students with course work and career interests in horticulture, plant pathology and related fields.

Project Objectives

1. To further the nursery research efforts at Oregon State University.
2. Provide students with plant science education and training related to nursery research.

Methods and Time Line

Spring 2013. Develop position announcement and distribute to universities and colleges throughout North America that have horticulture/plant science programs. Screen applicants and conduct interviews. Select one candidate.

Summer 2013. Intern's schedule will reflect the following division of work hours:

- 70% Assist in research projects. Duties include: study site establishment, treatment application, plant maintenance, and data collection.
- 20% Pursuit of student research/extension project. Select a project of interest and work with NWREC faculty to establish a study.
- 10% Visit nurseries to gain experience in the wide range of practices used in the industry.

Fall/Winter 2013. Program review and accomplishment reporting.

Results

For the 2013 field season (spring-fall) one intern was hired, Adriana Escobedo Land. Adriana assisted the nursery and Christmas tree faculty with smart sprayer and Christmas tree progeny evaluations, ornamental IR-4 trials, an aluminum sulfate hydrangea harvest, plant pathology laboratory work, insecticide efficacy trial in Noble fir Christmas trees, RFID experiment preparations and *Nostoc* plot set up and evaluations.

Assistance in these areas included duties such as plot maintenance, data collection and experiment initiation. This time spent on research projects helped Adriana gain skills in the use of scientific methodology, organization skills, use of equipment such as pH, EC meters as well as experience in growing plant material.

Nursery and Christmas tree farm visits through on-site research was encouraged, allowing Adriana to see a variety of production systems as well as meet members of the nursery and Christmas tree industries. Site visits included: Hans Nelson and Sons, J. Frank Schmidt and Son, Bailey

Nurseries, Smith Gardens, Holiday Tree Farms, Silver Mountain Christmas Trees, Kirk Company and Norlain Acres.

Beyond ensuring the success of nursery and Christmas tree faculty research, our intern spent time each week working on her own project.

- Adriana Escobedo Land – Reed College, Environmental Studies, Biology
 - Adriana's research project used problematic cyanobacteria that grow extensively on the gravel of nursery container yards. This cyanobacteria grows as green masses that contains several species microorganisms. Some of these have been identified to fix nitrogen. She used this green material as a potential source of nitrogen and incorporated it in the substrate to grow containerized greenhouse grown *Zea mays*.
 - Germinated and maintained plant material and collected data on leaf count, height, weight, collected soilless media and tissue samples as well as measured chlorophyll and pH and EC.
 - Wrote scientific style paper describing her methods and results of the project.
 - Adriana found wet cyanobacteria incorporated into soilless media produced a similar height and weight plant for up to 35 days in comparison to corn grown in a conventional soilless mix with traditional fertilizer applied.
 - Soilless media samples reported less available nitrogen in Nostoc amended soil than in conventionally fertilized samples.

Due to the funding award cycle, the funding from 2013 will also fund a portion of a student for 2014. The reporting of the results will follow the calendar year of the work done, therefore the results for the 2014 student will be reported on in next year's report.

Benefit to Nursery Industry

Nursery interns at the North Willamette Research and Extension Center are essential in allowing nursery research to be performed in a timely and efficient manner. This research, in turn, will be disseminated to the industry benefiting growers and stakeholders. Interns will also gain experience and education benefiting the industry when they join the workforce.