

# Washington State University

## Department of Crops & Soil Sciences

### Pullman, Washington- Fall 2013

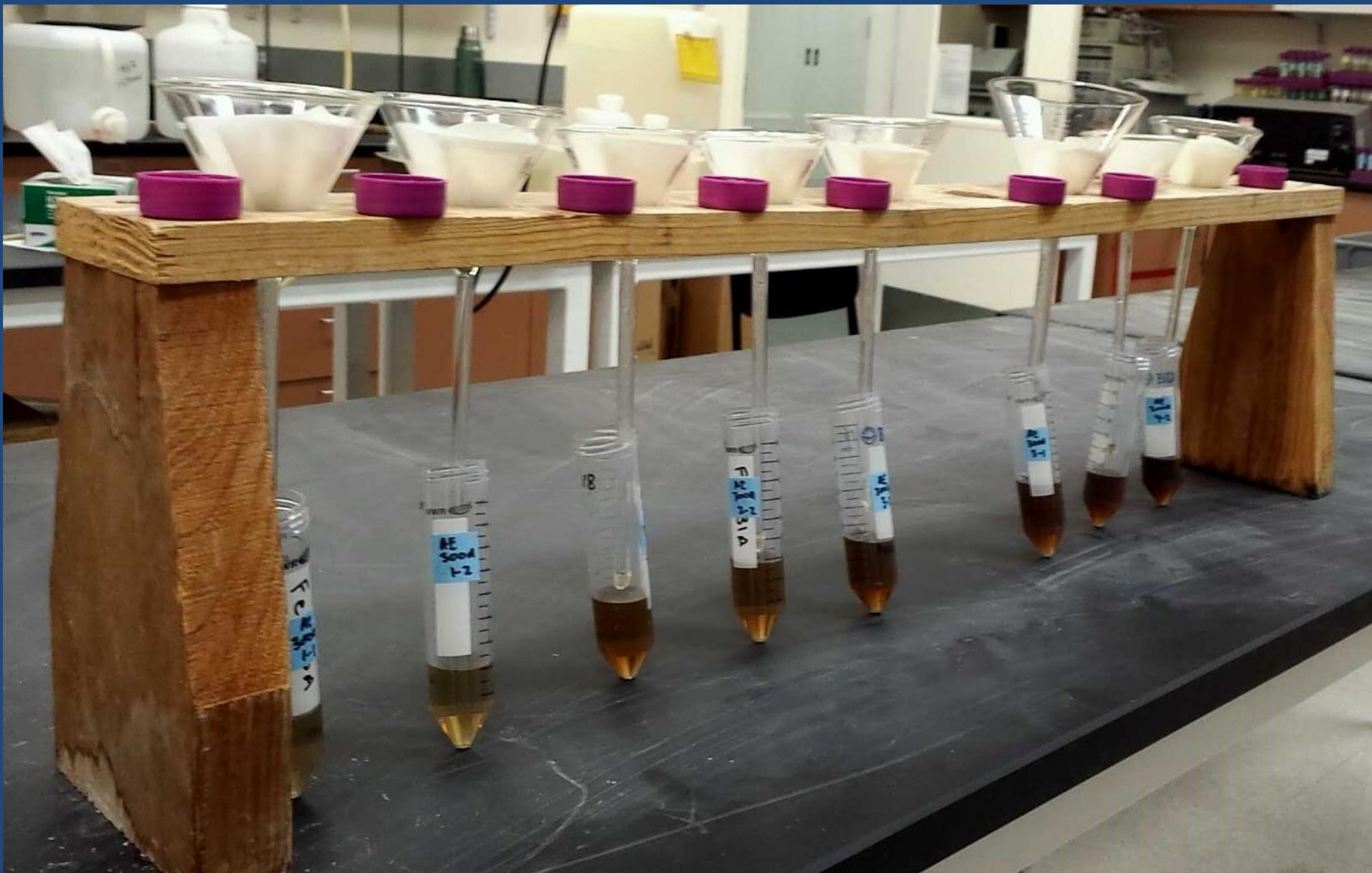
#### Jonathan Abarca

### Introduction

My internship took place in Pullman, Washington in the soil chemistry lab of the Department of Crops & Soil Sciences. I worked with mentors Zhenqing Shi and James Harsh. The lab has five graduate students working on soil chemistry and soil physics. I was able to work in various areas of the project, apply what I have learned in the classroom, and develop my research skills.

### Responsibilities

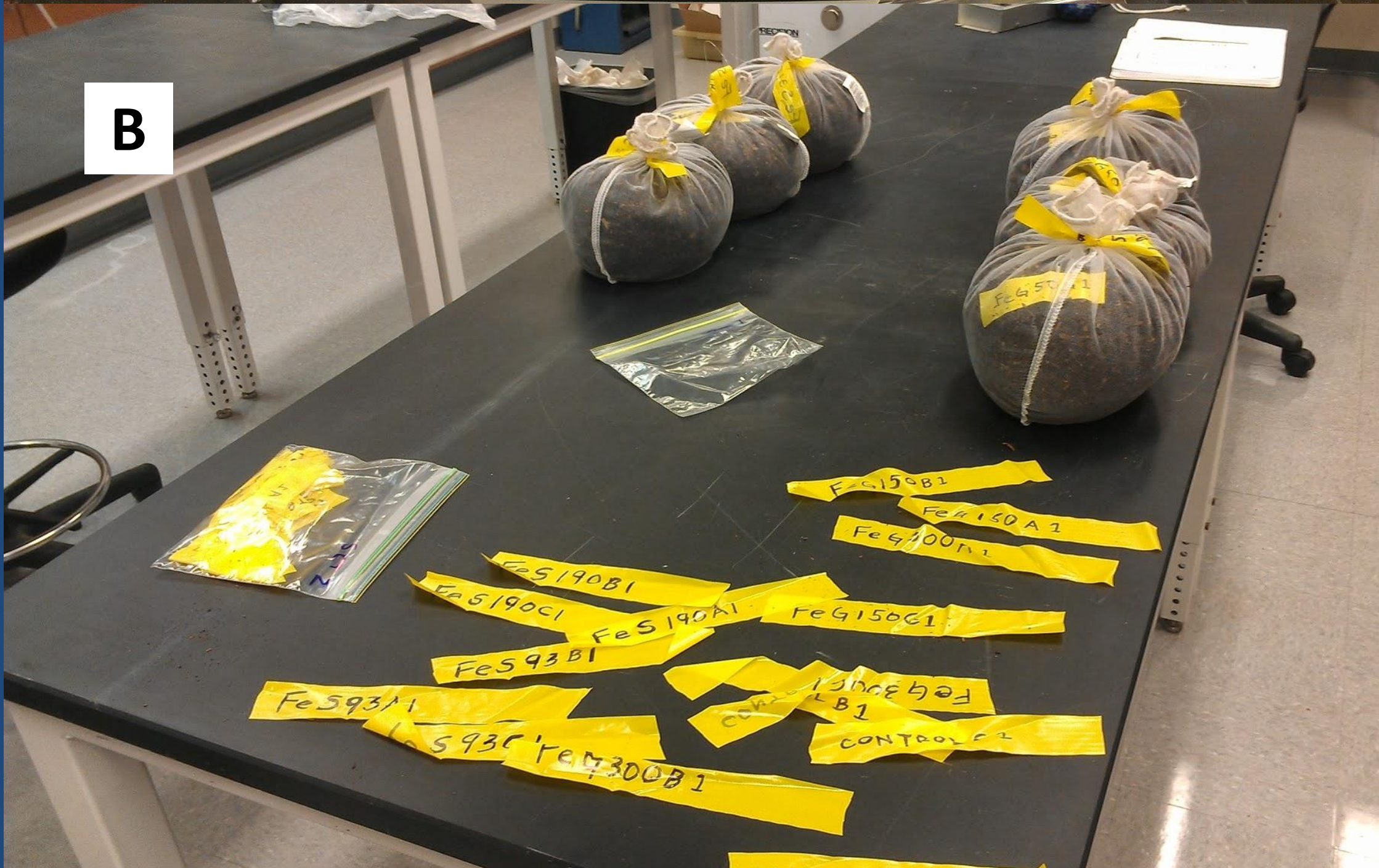
My major responsibilities consisted of evaluating iron compost for the remediation of contaminated soils. I conducted lead and phosphorus adsorption experiments and chemical extractions of compost samples in which I ran phosphorus, calcium, magnesium, iron, and lead analysis. I assisted in making compost samples with various amounts of iron and running experiments to evaluate remediation of contaminated soils with compost. I also helped clean lab equipment needed for my research work and other graduate students in the lab and assisted them in their experiments.



(Left) I am adding nitric acid to each of the samples to adjust the pH. For my project I had to pipette different chemicals into the samples depending on the experiment we were going to conduct. Sodium hydroxide or nitric acid was added to adjust the samples pHs.  
(Above) Samples are being filtered to collect the solutions and prevent soil particles from penetrating. The solutions were then analyzed for phosphorous, calcium, magnesium, carbon, and lead concentrations.



(Far Left) During my research experience I was able to learn and use an atomic absorption spectrometer, which is the machine we used to measure calcium, magnesium, and lead concentrations (middle). I was also able to use a Spectramax UV-Vis spectrometer to analyze phosphorous concentrations.



One of the projects I was involved with was making the compost batches with various iron sulfate and iron gluconate concentrations which are the ones used for evaluation of contaminated soil remediation. We used feedstock from the WSU composting facility as starting material. We weighed out about 1000 grams of feedstock, added the iron, and mixed thoroughly (A). Then placed the mixture in a bag with labels and tied them up (B). We then went to the WSU compost facility and buried them into the center of the pile where it is the hottest (C and (D)).



### Summary

Being able to work in a laboratory in which I worked on my own project was a valuable experience. I was able to learn lab techniques and skills as well as learning how to use scientific instruments. This internship showed me that research is a lot of work and even though in class you learn the concepts there is still much to learn. I developed valuable research skills and obtained good ideas on how to conduct research which will help me in graduate school in the future. I got the opportunity to learn about compost (its properties and functions), soil chemistry, and other areas of agriculture. My goals are to attend graduate school and aid agricultural workers through the improvement of harvest techniques and fruit quality. This research experience has been very rewarding. It has prepared and given me the skills necessary to be successful in my future career.