

Potato Soil Health for Organic Disease Management

[Dr. Lynne Carpenter-Boggs](#)

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Internship Description

Potato is considered the 6th most important staple food in the world. Potatoes provide carbohydrates, vitamins like Vitamin C, and minerals including potassium. Many factors can limit the yield of potatoes such as climatic factors, soil fertility, and diseases. Verticillium wilt of potato is one of the most important fungal diseases of potatoes.

Organic amendments such as green manure, composts, and compost tea are increasingly investigated as potential sustainable methods to improve soil and crop health. Organic soil amendments can affect disease management in several ways including changing the soil microbial community, nutrient availability, and physical characteristics. This study investigates ways in which soil health interacts with irrigation management decisions to affect verticillium wilt of potato. We are testing several organic soil amendments in combination with different irrigation regimes to assess effects on potato root growth and disease.

The student will have opportunity to engage in and learn about all stages of a research project from design to management, data collection, interpretation, and presentation. This will include hands-on work in the lab and field to assess effects of soil management on verticillium wilt of potatoes. This work contributes to growing the organic agriculture industry, increasing sustainable food production, and strengthening the impact of research on human and environmental health.

Expected work schedule 8 hours M-F, generally 8-4:30 with lunch break. Majors in Agricultural, Biological, or Environmental Sciences will best fit the internship, with intention to become a researcher or industry professional in organic or sustainable agriculture.

Antimicrobial disinfection of process water during apple post-harvest handling

[Dr. Meijun Zhu](#)

Professor, School of Food Science
Washington State University
Pullman, Washington.

Water is used for the transport of fresh produce, washing, processing, cleaning and sanitation, and handwashing in all segments of fresh produce. Un-sanitized water can also become a point of cross-contamination for foodborne pathogens including *L. monocytogenes* cross-contamination between water and fresh produce, as well as between fresh produces. To assure this fresh produce industry continues to grow and prosper, it is imperative to ensure the microbial safety of process water.

The newly proposed FDA Produce Rule and Preventive Controls Human Rule are challenging apple packers and handlers to develop specific efficacy data for their process controls. The fresh produce industry in Washington as well as in the nation has an immediate need to have effective *Listeria* control in their process water. In our laboratory, we are assessing the antimicrobial efficacy of the novel, natural, and practical antimicrobials against *L. monocytogenes* on fresh apples and in process water. These studies will be crucial for addressing *L. monocytogenes* safety in fresh produce.

The interested individual will engage in this exciting ongoing microbiological food safety research under the direction of Dr. Meijun Zhu. She or he will learn basic laboratory techniques related to food microbiology and food safety, which will include but are not limited to aseptic techniques, media preparation, inoculation, microbiological sample preparation, serial dilution, plating, colony counting/result analysis, and data presentation both in written and orally. The selected intern will work closely with graduate students and the lab manager in the PI's lab via on-job training, team projects, data analysis, and discussion and presentation.

Daily work schedule: 9:00am-5:00pm in general, which can be flexible as needed.

Ideal major course of study: Food Science, Microbiology, Biology, and other related majors.

Impact of ultrafine bubbles on the longevity of probiotics in fermented milk

[Dr. Minto Michael](#)

Assistant Professor of Dairy Science
School of Food Science
Food Sci & Human Nutrition Building
Dairy Microbiology Laboratory & Food Processing Laboratory
Washington State University
Pullman, WA

Position Description

Probiotics are beneficial microorganisms that help improve the overall health of the host mainly by enhancing the natural gut microflora. However, it is vital to consume live and active probiotics to get any health benefits. Students for this internship will mainly work on probiotics viability in fermented milk. Ultrafine bubble technology is a novel concept in the field of food processing. Therefore, students will test the impact of ultrafine bubbles on the viability and longevity of probiotics in fermented milk. Students will also learn how to make yogurt and kefir in the laboratory. Students will get an opportunity to tour the WSU Creamery and learn how to make cheese and ice cream. If students want to learn more, then they are welcome to work with Dr. Michael's graduate students and learn about different aspects of dairy pathogens and food safety.

Students' daily work schedule will vary from day to day depending on the project activities and other research going on in the laboratories. However, students are expected to work in the laboratories or student offices from 8:00 AM to 5:00 PM during the weekdays with an hour lunch break. Students will also meet with Dr. Michael as a research group for about an hour every week; however, students can stop by Dr. Michael's office anytime if they have questions or just say hello.

Majors and Student Interests: Food science, dairy science, microbiology, animal science, agricultural science, and human nutrition

Prevalence and Identification of Antimicrobial Resistant Foodborne Pathogens in Food Products

[Stephanie Smith](#)

Assistant Professor

Statewide Consumer Food Safety Specialist

School of Food Science

Pullman, WA

The number of pathogens exhibiting antimicrobial resistance has been growing over the years. Even more concerning, many of these pathogens exhibit multi-drug resistance, making it difficult to treat diseases caused by these pathogens. For example, as many as sixteen percent of *Salmonella* strains are resistant to at least one essential antibiotic used to treat severe infection. Two percent are resistant to three or more essential antibiotics. Currently, the CDC has deemed drug-resistant *Salmonella*, *Campylobacter*, and other Enterobacterales a serious threat to public health.

This research internship aims to enumerate and identify pathogens in various food samples exhibiting antimicrobial resistance. Food will be purchased from local retail outlets, and bacteria will be isolated from food samples. Bacteria will then be plated on media containing antibiotics, and bacteria showing resistance will be enumerated, undergo DNA sequencing and identified. Results will be compiled and data analyzed for each food type.

It is anticipated that the intern will work Monday through Friday up to 40 hours a week during regular business hours. Occasional weekend work may be required depending on the status of experiments. List of specific majors and/or student interests that would best fit the internship include: Microbiology, Food microbiology, molecular biology, biology, food science

Vegetable production in the Columbia Basin

[Tim Waters](#)

Professor and Regional Vegetable Specialist
WSU-ANR Unit Extension
Pasco, WA

Internship Description

The intern will be responsible for assisting in field and laboratory experiments pertaining to irrigated agriculture in the Columbia Basin including setting up experiments and evaluating research trials. This includes formation of plot maps, packaging of seed entries, planting vegetables, plot layout, slide mounting specimens, quantification of insect populations, and evaluating crop yield and quality. The intern will be expected to enter data into various computer programs and will be expected to photograph and document farm plot trial progress. Work will be indoors and outdoors. Outdoor conditions in the Columbia Basin can be very warm in the summer. The intern will have to work alone at times, but as part of a team at other times. Requires attention to detail, critical thinking, and on the go problem solving.

In addition to the scientific aspects, this opportunity allows the intern to learn about the agronomic production of various vegetable crops first-hand including potato, onion, sweet corn, carrots, and others. The intern will learn how to use various research and production equipment including small and large tractors, injection pumps, and center pivot irrigation equipment. Travel to field sites is at times required as far as 50 miles away from Pasco, WA.

The internship will take place in Pasco, WA, in the Columbia Basin Region of Washington State. The Columbia Basin is one of the eminent vegetable production regions in the United States. Within 50 miles of Pasco, there are 1000's of acres of irrigated vegetable crops including peas, sweet corn, beans, potatoes, onions, carrot, asparagus, squash, and melons among many others.

Daily tasks may include insect enumeration, collection of tissue and soil samples, scoring plant health, and vegetable harvest. Some days would include participation in WSU organized field days and visits to grower fields for consultation with farmers.

Undergraduate students pursuing degrees in entomology, plant pathology, weed science, soil science, agronomy, biology, and other scientific fields. Students in agricultural degree programs at community colleges have also benefited from these opportunities in the past as have undecided students.