Application deadline:
April 1, or until filled; must be a U.S. citizen

Salary:
$17.00/hr

Start date:
June 2, 2024, flexible

Biological Science Aid—Multiple Positions
3 ***paid*** *internships, full-time summer*

Nature of Student Research Internship:
The USDA-ARS North Central Agricultural Laboratory (NCARL) in Brookings, SD, is recruiting three undergraduate student research interns for the summer of 2024. Applicants from under-represented groups including women, ethnic/racial traditionally under-represented populations, individuals with disabilities, and veterans, are especially encouraged to apply. These positions are funded by the 2024 Plains Area Internship Program and aim to support NCARL's goal to develop, document, and promote soil, crop, and pest management practices that are ecologically sustainable while maintaining producer profitability.

This internship will run for 8 to 12 weeks during summer of 2024. Successful applicants will be directly mentored by a USDA scientist throughout the internship. Specific details regarding each internship opportunity are provided on the following page. Interns will present research findings in a 20 minute research seminar at NCARL after 8 weeks, then prepare a written report by the culmination of this experience.

Internship 1 - Brief Description of Duties:
(Microbiology Laboratory, Dr. Chuntao Yin)
Sclerotinia sclerotiorum is a devastating fungal pathogen with a broad host range that causes white mold and Sclerotinia stem rot diseases on many important crops. The student will perform research on isolation, testing, and identification of bacteria from the plant and sclerotia zones to protect soybean plants against white mold disease. Duties will include: (1) learning to isolate and culture bacteria and prepare the inoculum of S. sclerotiorum; (2) screening bacterial isolates for antifungal activities in a dual-culture assay; (3) learning to inoculate host plants with S. sclerotiorum; (4) testing the abilities of selected bacteria to protect susceptible soybean from S. sclerotiorum infection in a growth chamber; (5) scoring leaf diseases of soybean for evaluating plant responses to S. sclerotiorum infection; (6) identifying the selected bacteria using colony PCR and sequencing method; (7) analyzing the collected data and writing up a final progress report.

Questions about position, or interested in applying:
Email: Chuntao.Yin@usda.gov; Phone: 605-693-5207

Internship 2 - Brief Description of Duties:
(Insect Ecology Laboratory, Dr. Karl Roeder)
In the northern Great Plains, recent droughts have reduced soil moisture and created stressful, dry conditions for beneficial insects like pollinators. As such, one undergraduate student will quantify desiccation resistance of the four most economically important managed pollinator species in the United States: honey bees, bumble bees, alfalfa leaf cutting bees, and mason bees. Duties will include: (1) preliminary reading of scientific literature on desiccation resistance, (2) pilot testing physiological assays to determine desiccation resistance/survival rate/critical water content, (3) running a full experiment on each species under different abiotic conditions to test for synergistic stressors using environmental chambers and animal activity detectors, (4) creating a presentation for the USDA NCARL staff, and (5) writing up a final progress report. During the internship, the candidate will work in a team environment to achieve research objectives and will receive mentorship on experimental design, lab methods, and data curation during weekly progress meetings with the principal investigator.

Questions about position, or interested in applying:
Email: Karl.Roeder@usda.gov; Phone: 605-693-5211

Internship 3 – Brief Description of Duties:
(Soil Invertebrate Laboratory, Dr. Adrian Pekarcik)
Soybean gall midge emerged as a new species and pest of soybean in South Dakota in 2018. Management tools like insecticides are largely ineffective, thus alternative approaches like biological control are needed. The intern will conduct field and laboratory research to 1) evaluate the ability of insect-killing nematodes to suppress soybean gall midge populations, and 2) monitor the survival and persistence of nematodes in the field following their application. For Objective 1, duties include: assisting with establishing research plots at the field sites; preparing and applying nematode treatments; setting up soybean gall midge emergence traps; estimating gall midge abundance weekly from emergence traps, soil, and plant galls; and collecting other relevant data. For Objective 2, duties include: collecting soil cores from the field, processing them in the lab to extract nematodes, and estimating nematode abundance over time from the different treatments. For both objectives, the candidate will record, curate, analyze, and interpret the data.

Questions about position, or interest in applying:
Email: Adrian.Pekarcik@usda.gov; Phone: 605-693-5210