Opportunity Title: USDA-ARS Postdoc in Spectral Imaging for Early Detection of Fungal Infection and Mycotoxin Risk in Corn
Opportunity Reference Code: USDA-ARS-SEA-2025-0182

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-SEA-2025-0182

How to Apply ***To submit your application, scroll to the bottom of this opportunity and click APPLY.***

A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted.
  Click here for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations

All documents must be in English or include an official English translation.

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Application Deadline 2/13/2026 3:00:00 PM Eastern Time Zone

Description ***Applications are reviewed on a rolling-basis.**

ARS Office/Lab and Location: A research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), within the Food and Feed Safety Research Unit (FFSRU) at the Southern Regional Research Center located in New Orleans, Louisiana

The Agricultural Research Service (ARS) is the U.S. Department of Agriculture's chief scientific in-house research agency with a mission to find solutions to agricultural problems that affect Americans every day from field to table. ARS will deliver cutting-edge, scientific tools and innovative solutions for American farmers, producers, industry, and communities to support the nourishment and well-being of all people; sustain our nation's agroecosystems and natural resources; and ensure the economic competitiveness and excellence of our agriculture. The vision of the agency is to provide global leadership in agricultural discoveries through scientific excellence.

Research Project: The participant will be assigned to research pertaining to USDA-ARS project 6054-42000-025-00D entitled "Development of Aflatoxin Resistant Corn Lines Using Omic Technologies." in the FFSRU. The mission of the FFSRU is to safeguard essential U.S. agricultural commodities (e.g., corn, cottonseed, peanut, and tree nuts) from aflatoxin contamination using a multidisciplinary approach. Aflatoxin contamination in corn remains one of the most persistent threats to U.S. agriculture, with

significant implications for food safety and crop quality. Current satellite imaging technologies lack ability to detect early-stage fungal infections, limiting our ability to intervene before contamination occurs. This project proposes a novel approach using advanced near-infrared (NIR) spectral imaging in greenhouse (*in planta*) and in field experiments to capture vegetation index patterns in healthy, stressed and infected corn plants across developmental stages. By correlating these spectral signatures with aflatoxin levels at harvest, we aim to develop predictive models, powered by deep neural networks, that can detect early signs of fungal infection and evaluate mitigation strategies such as soil amendments.

The overall objectives of the project include:

1. Identify mathematical relationship among normalized difference vegetation index, plant developmental stages and plant health.
2. Develop artificial intelligence models that connect normalized difference vegetation index, plant developmental stages, plant health and aflatoxin contamination
3. Develop and evaluate hybrids and corn lines in greenhouse and field conditions
4. Perform modeling and data analysis using coding tools and geospatial data

Under the guidance of the mentors, the participant will have the opportunity to develop and conduct *in planta* experiments, generating data that the participant will then incorporate into predictive models. The participant will collaborate closely with the mentors to produce, document, and share quality research results through open-access, peer-reviewed journals as well as update important stakeholders on key findings. The participant will also be encouraged to establish collaborations with university and USDA-ARS scientists. The participant will contribute to valuable and impactful research while receiving ample opportunities to interact with a diverse group of scientists at the Southern Regional Research Center.

Learning Objectives:

- The participant will receive mentorship and training in plant-fungi interactions, spectral imaging, geospatial analysis, and mycotoxin analysis. They will gain hands-on experience in experimental design, data modeling, and interdisciplinary collaboration.
- Training on acquisition and analysis of vegetation index data.
- Training in development and care of greenhouse/field experiments.
- Training in geospatial data analysis, and modeling of biological systems.
- Training for extraction and detection of fungal/microbial contaminants, including quantitative data analysis of critical toxins from fungal infection (mycotoxins).
- Opportunity to collaborate with and learn from highly qualified and experienced employees and collaborate with experts across academia, government, and industry.

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Mentor(s): The mentors for this opportunity are Dr. Lina Castano-Duque (Lina.Castano.Duque@usda.gov) and Dr. Matthew D. Lebar (matthew.lebar@usda.gov). If you have questions about the nature of the research, please contact the mentor(s).

Anticipated Appointment Start Date: 2025/2026. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year but may be renewed upon recommendation of ARS and is contingent on the availability of funds.

Level of Participation: The appointment is full time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. **The anticipated stipend range is $65,000 - $70,000 annually.**

Citizenship Requirements: This opportunity is available to U.S. citizens only.

ORISE Information: This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and ARS. Participants do not become employees of USDA, ARS, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

Questions: Please visit our Program Website. After reading, if you have additional questions about the application process, please email ORISE.ARS.Southeast@orau.org and include the reference code for this opportunity.

Qualifications The qualified candidate should be currently pursuing or have received a doctoral degree in the one of the relevant fields (e.g. Plant Sciences, Plant pathology, mathematics).

Stipend $65,000.00 – $70,000.00 Yearly

Point of Contact Janeen

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Life Health and Medical Sciences** (3 👁)
  - **Mathematics and Statistics** (2 👁)
  - **Physics** (1 👁)