

# CIPM Plant Health Certificate Program

## Introduction

Integrated Pest Management (IPM) spans a range of concerns including insects, plant pathogens, weeds, and mollusks. Our Center for IPM (CIPM) offers an interdisciplinary platform that leverages expertise from various fields such as entomology, plant pathology, modeling, geospatial analytics, statistics, crop science, economics, and data science. Our core courses reflect this diversity. First, we introduce students to a range of pest types, highlighting their roles as invasives and their impact on U.S. agriculture and natural resources. The coursework includes unique biological features that characterize each group of organisms, discussing what makes them problematic and, in some cases, particularly difficult to manage.

Another key course focuses on pest risk analysis, designed to provide students with the methodologies and frameworks for evaluating the likelihood and consequences of entry, establishment, and impact of non-native species in the United States. The course dives deep into how to conduct effective pest risk analysis. Students will learn about detection and eradication strategies for invasive species and will also be introduced to best practices aimed at facilitating trade while protecting U.S. agriculture and natural resources. The skills and knowledge acquired in this course will make students strong candidates for federal positions specializing in plant biosecurity and regulatory affairs.

One core element of our certificate program is a dedicated course on risk management and communication, designed to inform students about the nuances involved in IPM. This course goes beyond traditional risk assessment techniques and dives into risk perception and the art and science of effective communication strategies. Recognizing that risk management is not just a mathematical or scientific endeavor, we prepare students to engage with stakeholders, consumers, and policy makers. This curriculum covers not only the mechanics of risk quantification but also the complexities of conveying that risk to diverse audiences. Topics such as public attitudes and perceptions toward pesticides, environmental and human health risks, and case studies on communication strategies form an integral part of the course. The aim is to cultivate comprehensive expertise in managing and communicating about risk in a multifaceted agricultural landscape. We will also encourage student-led projects that allow for real-world applications of risk assessment in various contexts.

In a world where climate change continually reshapes the agricultural landscape, our courses are designed to instill an understanding of the broader challenges facing global agriculture. Integrating advanced data analytics and modeling techniques, we prepare students to navigate not only pressing environmental challenges such as droughts and pest outbreaks but also complex socio-economic challenges such as conflicts, limited funding, and gender disparities in agriculture. The goal of this certificate program is to cultivate a holistic understanding of agricultural challenges within a One Health framework, thereby promoting the development of sustainable and resilient agricultural systems.

## **Mission Statement**

The mission of our Plant Health Certificate Program is to cultivate a new generation of leaders equipped to address global agricultural challenges through a multidisciplinary lens. Our curriculum, founded on the principles of IPM, emphasizes data-driven decision-making, risk analysis, and effective communication strategies. Focused on both sustainable agriculture and the practical dimensions of pest control, we prepare our students to apply their skills in a range of contexts—from local ecosystems to international policy arenas. In doing so, we aim to contribute to the creation of more sustainable, resilient, and data-informed agricultural systems worldwide.

## **Vision**

With this graduate certificate program, our vision is to be the global epicenter for multidisciplinary education and research in sustainable plant health. We aspire to empower students with the analytical tools, practical skills, and ethical frameworks needed to navigate and address the complex challenges facing global agriculture within a One Health context. They will be equipped to tackle imminent challenges such as invasive pests, climate change, and food security, ultimately transforming agriculture into a more sustainable and resilient system.