

# MAJOR IN AGRICULTURAL BIOLOGY, WEED SCIENCE CONCENTRATION



The Agricultural Biology major with a concentration in Weed Science provides a strong scientific foundation in weed science to address challenges in natural and managed systems. Students will gain tools to foster sustainability and address pressing issues involving biophysical and sociocultural components of these systems. The major features courses in agriculture, biology, and ecology as well as practical training through internships and/or research experiences. Students will also learn the complex interactions that occur among microbes, insects, and plant species in natural and managed ecosystems and develop skills to use systems thinking to solve real-world problems. Knowledge and skills gained from the major will enable students to identify and solve complex problems in natural and managed systems, especially in implementing effective and sustainable pest management.

## Learning Objectives

- 1. Technical Competencies:** Integrate skills and knowledge to solve problems related to plants, insects, and microbes in natural and managed ecosystems. Students will be able to apply knowledge of current technologies to:
  - Identify important plants, insects, and microbes, integrating methods such as molecular approaches and ocular use of taxonomic keys.
  - Explain the biology and ecology of important pests and beneficial species.
  - Provide cost effective, socially acceptable, and environmentally sound pest management solutions.
- 2. Agricultural Literacy:** Demonstrate understanding of social, economic, and biophysical aspects of the management of biological problems in natural and managed ecosystems:
  - Identify participants and evaluate their roles in pest management policy, including regulatory frameworks.
  - Describe the similarities and differences among management of biological problems such as infestations of weeds, insect pests, and or disease in natural and managed ecosystems.

- Develop logical, objective, balanced arguments regarding contemporary issues in natural and managed ecosystems.
  - Explain the benefits and risks of management practices in natural and managed ecosystems.
- 3. Critical Thinking:** Describe, assess, analyze, and synthesize knowledge from across the curriculum to create solutions for pests and beneficial species in natural and managed ecosystems:
    - Describe critical problems and gaps in information for natural and managed ecosystems through assessment, analysis, and integration of facts. This includes the productivity and sustainability of these ecosystems and issues described in 2c above.
    - Integrate, synthesize, and apply information from across the curriculum to create solutions to complex problems. Complex problems are challenges to productivity and sustainability of natural and managed ecosystems such as described in 2c above.
    - Analyze qualitative (facts) and quantitative (numerical) information and derive conclusions about challenges in the productivity, sustainability, and management of natural and managed ecosystems.
  - 4. Leadership:** Promote and practice inclusion to form effective teams that solve complex problems in natural and managed ecosystems.
    - Function effectively within diverse teams to solve complex problems and achieve desired outcomes in natural and managed ecosystems.
    - Create and facilitate inclusive and diverse teams.
  - 5. Communication:** Communicate effectively with diverse audiences regarding sustainable pest and pathogen management in natural and managed ecosystems:
    - Excel in written and verbal communication of scientific results and analyses of information related to sustainable pest and pathogen management to diverse audiences including peers, stakeholders, public and the media.
    - Engage stakeholders such as researchers, farmers, and industry representatives in the identification of pest and pathogen management needs.

## Concentration-Specific Learning Objectives in Weed Science

Upon successful completion of the Weed Science Concentration, students will be able to:

- Identify and classify weeds of economic importance in diverse systems.
- Explain the mechanisms and causes of herbicide resistance.
- Integrate basic and applied knowledge of weed science to develop effective weed management strategies in agricultural systems.

## Potential Occupations

This major will be an excellent choice for students interested in careers as researchers, crop advisors, extension educators, growers, agriculture consultants, production managers, inspectors, diagnosticians, regulatory professionals and for those who wish to pursue careers in academia.

## Advising

Reach out to Chris Amerman (Chris.Amerman@colostate.edu) to schedule an appointment to change your major/minor. The change of

major form can be electronically submitted by a student's main advisor to the Registrar's Office.

- Individualized Appointment with Advisor Link for Scheduling - <https://calendly.com/socr-advising> ([https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fcalendly.com%2Fsocr-advising%2Fadvising-appointment%3Fmonth%3D2023-03&data=05%7C01%7CGiovanni.Tolentino\\_Ramos%40colostate.edu%7C1a3bedec788549031af108db20c2da86%7Caf58802ff7a4bb1ab21367ff2ecfc8b%7C0%7C0%7C638139793483113872%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6Ikl1haWwiLCJXVCi6Mn0%3D%7C3000%7C%7C%7C&sdata=a07T1zEgzLuGzC6TFEiqRYDibN5xb3xo2ZQzcn%2Fyjr0%3D&reserved=0](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fcalendly.com%2Fsocr-advising%2Fadvising-appointment%3Fmonth%3D2023-03&data=05%7C01%7CGiovanni.Tolentino_Ramos%40colostate.edu%7C1a3bedec788549031af108db20c2da86%7Caf58802ff7a4bb1ab21367ff2ecfc8b%7C0%7C0%7C638139793483113872%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6Ikl1haWwiLCJXVCi6Mn0%3D%7C3000%7C%7C%7C&sdata=a07T1zEgzLuGzC6TFEiqRYDibN5xb3xo2ZQzcn%2Fyjr0%3D&reserved=0))

Our majors and minors have no competitive entry requirements. Courses to take if you are interested in the programs include AB 111, BSPM 102, BSPM 302, BSPM 308, and BSPM 361. Students interested in our program should ideally declare in the first two years, but exceptions can be made depending on the student's previous coursework. For more information, please visit the Department of Agricultural Biology website (<https://agsci.colostate.edu/agbio/>).