

# PLANT SCIENCES, B.S.

**Begin Campus:** Any Penn State Campus

**End Campus:** University Park

## Program Description

The Plant Sciences Major is an applied biological science program designed for students seeking careers in agronomic and horticultural crop production systems and enterprise management, agroecology, sustainable and organic managed and natural ecosystems, crop protection, applied plant physiology, plant science research, and plant biotechnology. Students will secure:

1. a working knowledge of basic plant biology, soils, pests, and pathogens with emphasis on growth, development, and physiology in an ecological and agricultural context,
2. the scientific, technical, and computational approaches to problem solving in an ecological and agricultural context, individually and in teams,
3. the ability to analyze ethical issues regarding ecosystem sustainability, business practices and plant science, and critically evaluate and respect different viewpoints in making management decisions, and
4. a high level of proficiency in written and oral communication, particularly with regard to critical evaluation of scientific issues.

There are five options in the major, providing flexibility for concentrations in areas including production and management systems related to agronomic and horticultural crops, plant biotechnology and breeding, crop physiology, ecology, agroecology, and other aspects of general plant science. Students can choose from diverse course offerings in designing a program of study suited to their needs and professional goals.

### Agroecology Option

This option applies an ecological approach to understanding and managing cropping systems to meet societies' needs while enhancing environmental protection and resource conservation. Students will develop skills to manage agroecosystems for sustainable productivity, profitability and environmental protection by studying plant and soil sciences, ecology, and pest management from a systems perspective. The curriculum prepares students for a wide range of careers in agricultural and ecological fields, sustainable food production, and for graduate studies.

### Crop Production Option

This option provides students with practical and field-related skills in Agronomy (field crop production and soil management). Students will focus on techniques and knowledge necessary to efficiently and economically manage soils, crops and other farm resources with additional emphasis on pest management and commodity marketing. Courses stress the skills and information needed to work with current production technologies such as seed traits, crop protection chemicals, and fertilizers to improve yield and productivity.

### Horticulture Option

This option prepares students to enter the horticultural industry by providing a broad background in courses related to production and physiology of horticultural crops. Additional courses in pest management and business are required. Graduates may work as orchard, greenhouse,

garden center, nursery or farm managers, with horticultural and landscape service providers, suppliers, and brokers, with cooperative extension and other government and non-governmental agencies and public and private gardens, or continue with graduate studies.

### Plant Genetics and Biotechnology Option

This option is a combination of basic science and technology-based classes designed for students who are seeking careers in agricultural sciences, plant breeding, plant molecular genetics and plant biotechnology based industries. It provides students with maximum flexibility in selecting a program of study suited to their needs and to achieve professional goals related to advanced degrees or immediate job placement in the industry. The option provides theoretical and practical skills of plant genetic manipulation relevant to plant biotechnology, plant breeding and genome research.

### Plant Science Option

This option emphasizes the application of the biological sciences to problem-solving in agronomic and horticultural ecosystems. Topic areas include plant biology, plant pathology, plant microbiology, plant biotechnology, plant-insect interactions, horticulture, crop science, plant ecology, and bioenergy. Graduates may find employment in industry, government and academic research programs as technicians and research assistants, or pursue graduate degrees.

## What is Plant Sciences?

Plant Science is the study of plant growth, development and physiology that focuses on the production, use, improvement, management and protection of plants and plant-based products. Plant Scientists seek ways to improve the yield and quality of agronomic and horticultural crops for food, fiber, fuel and ornamental purposes.

MORE INFORMATION ABOUT PLANT SCIENCES (<https://plantscience.psu.edu>)

### You Might Like this Program If...

- You enjoy hands-on learning in labs, greenhouses, and in the field. Our teaching and learning facilities include more than 30,000 square feet of greenhouse space, more than 700 acres of research and teaching farms, a four-acre student farm, and numerous hydroponics systems.
- You are interested in sustainable, organic, and conventional food, fuel, fiber, and ornamental production systems.

MORE INFORMATION ABOUT WHY STUDENTS CHOOSE TO STUDY PLANT SCIENCES (<https://agsci.psu.edu/academics/undergraduate/majors/plant-sciences/>)