Sustainable Food & Bioenergy Systems

This program is a unique interdisciplinary curriculum designed for students interested in the interconnected processes of crop production, processing, distribution, and utilization of food and bioenergy. The degree focuses on ecologically sound, socially just, and economically viable farming methods, food and health, and related food and bioenergy system topics. Students work closely with faculty to gain hands-on experience enhancing practical skills and knowledge, and in specific, self-selected focus areas through internships. The degree plan is intended to encompass a wide range of food- and bioenergy-related areas in order to prepare students for career opportunities in agricultural business, public health and community food security, natural resource conservation, bioenergy production, marketing, distribution, and local food systems.

Sustainable Food Systems Option

The Sustainable Food Systems Option draws from both the physical and social sciences in the areas of food and nutrition, family and consumer sciences, plant sciences, environmental sciences, ecology, sociology, and political science. Emphasis in this option is on health and consumer issues related to food production and food systems. Students gain hands-on experience in culinary fundamentals and management, organic gardening, and independent research projects. Internships are designed to provide experience with food processing, food cooperative management, alternative food distribution systems, and small business operations. Having a better understanding of the interconnections among food production, food policy, food security and health, helps prepare graduates capable of addressing interdisciplinary food system problems such as obesity, food insecurity and poverty, food safety, and loss of indigenous foods, among others.

Career Opportunities

Graduates from this option are prepared for careers in community nutrition, community food security, public health, Extension education, food and nutrition policy and education, food enterprise, culinary arts and management, community supported agriculture, food processing, food marketing, retailing and distribution.

Agroecology Option

Agroecology explores how crops and pest organisms interact with their environment, and the application of technology to efficiently and sustainability produce crops. Agroecology focuses on application of principles of population and community ecology, as well as environmental science, to cropland ecosystems. The curriculum is based on the philosophy that to be able to successfully predict management outcomes and thus make informed recommendations, one must understand fundamental principles of evolution, ecology, soil science, agronomy, and pest management.

The curriculum originates from a base in biological science which includes a broad knowledge of organisms (including plants, animals, and microorganisms) and the physical and chemical characteristics of environments. In the Agroecology curriculum, students will develop a knowledge of the diversity of organisms and how they interact in natural and managed ecosystems. Furthermore, the curriculum will build on this knowledge in courses that demonstrate the application of ecology and environmental science principles. Students will also learn how new technologies like remote sensing and geographic information systems are modernizing agriculture. In later stages of the curriculum, students may select from an array of upper division courses in natural ecosystems, cropping systems, pest management, applied ecology, and policy and planning that enable them to specialize in food or bioenergy-related areas best suited to their own career vision.

Career Opportunities

Graduates from this option find careers in environmental industries and consulting firms that solve problems associated with agroecosystems or agricultural practices; government jobs in environmental management and policy making; agricultural industry positions associated with precision agriculture, pest management, general agronomy, and information services. Students will be prepared for graduate training that leads to independent research in basic and applied ecology, environmental biology, cropping systems, precision agriculture, ecologically-based pest management, or weed science.

Sustainable Crop Production Option

Where does our food come from? Are there ways to sustainably maintain production levels and yet protect our natural resources? Is it possible to improve the quality and nutrition of our food supply? Are local food systems a viable alternative to corporate agricultural production? Can crops grown for bioenergy production reduce our use of fossil fuels and lessen carbon dioxide emissions? The answers to these questions and many more are discovered by students in the Sustainable Crop Production Option. The curriculum is designed to acquaint students with a broad range of principles and issues in sustainable crop production, including soil fertility, plant physiology, greenhouse production, pest management, and small business management. Both large- and small-scale food and bioenergy production systems are examined.

Career Opportunities

Graduates from this option are prepared for careers in agricultural production, community nutrition, community food security, public health, Extension education, food and nutrition policy and education, food enterprise, culinary arts and management, community supported agriculture, food processing, food marketing, retailing and distribution.

Sustainable Livestock Production Option

Sustainable Livestock Production focuses on the biological understanding of animal agriculture and its continued presence in sustainable grazing systems as well as its potential role in sustainable farming systems. Students will be introduced to the principles, practices and issues impacting the production, processing and preservation of safe, wholesome, nutritious, and palatable meat along with the regulatory requirements for selling animal products. Sustainable Livestock Production focuses on the science of animal production, but expands student learning to a larger systems understanding to the role of domestic livestock in sustainable systems. In addition, students will be exposed to the role of strategic grazing in landscape management as well as using livestock to manage potential waste streams from other industries.

Career Opportunities

Graduates from this option are prepared for careers in both the production and allied industries associated with animal agriculture and will also prepare the student for opportunities in extension and graduate work.

Undergraduate Programs

- Agroecology Option (http://catalog.montana.edu/undergraduate/agriculture/sustainable-food-bioenergy-systems/agroecology-option)
• Sustainable Crop Production Option (http://catalog.montana.edu/undergraduate/agriculture/sustainable-food-bioenergy-systems/sustainable-crop-production-option)
• Sustainable Livestock Production Option (http://catalog.montana.edu/undergraduate/agriculture/sustainable-food-bioenergy-systems/sustainable-livestock-production-option)