

# Agriculture

## Plant Sciences

An exciting feature of this department is the diversity of programs in:

- **Crop Science:** The challenge is to implement crop and soil management schemes that maintain and/or increase production, while conserving soil and water resources to preserve the delicate balance in the agroecosystems.
- **Plant Biology:** The expertise of the faculty provides an opportunity to focus at the cellular and molecular levels, but opportunities also exist for emphasis in plant ecology and systematics.
- **Horticulture Science:** Ornamental Horticulture is the science and art of growing and maintaining ornamental plants for the enjoyment and improvement of the human environment.
- **Landscape Design:** Prepares students to solve aesthetic and functional landscape problems. Technical and creative studies lead to problem-solving skills, which are used to create beautiful, functional, and efficient landscape design solutions.
- **Plant Genetics:** Research areas and faculty expertise includes: cereal quality, molecular genetics, plant breeding and genetics, cytogenetics, biochemistry, plant physiology and agronomy.
- **Plant Pathology:** Active research projects include: soil-borne diseases of cereals, genetic basis for disease resistance in field crops, the biochemistry and molecular genetics of plant disease and biocontrol of weeds using plant pathogens and/or their toxins.

### Degrees offered:

- **BS Plant Science**  
Crop Science; Plant Biology
- **BS Horticulture**  
Horticulture Science; Landscape Design
- **MS/ PhD Plant Sciences**
- **MS Plant Pathology**

### Plant Sciences & Pathology

119 Ag BioScience Facility  
Montana State University-Bozeman  
Bozeman, MT 59717-3150  
Phone: (406) 994-5171 or 994-4832  
Fax: (406) 994-7600  
E-mail: [plantsciences@montana.edu](mailto:plantsciences@montana.edu)  
Website: <http://plantsciences.montana.edu>

## Land Resources and Environmental Science

The Department of Land Resources and Environmental Sciences (LRES) blends disciplines involving soils, microorganisms, plants and water into an integrated multidisciplinary approach for understanding and managing land resources. The focus is on natural and managed landscapes and ranges from fundamental investigations in environmental sciences to applied studies in agriculture and concerns with environmental quality and land management.

Highly productive faculty utilize modern greenhouses and labs, and specialized resources such as the Center for Invasive Plant Management, the Reclamation Research Unit, the Thermal Biology Institute and research stations throughout the state for cutting-edge research. Department resources also include the Soil, Plant and Water Analytical Laboratory, a 300-acre Agronomy Field Research Laboratory, and the Plant Growth Center.

LRES research and internship programs offer opportunities for advanced study beyond the classroom. Research is conducted in the following major areas:

- Agriculture Systems
- Spatial Analysis & Decision Making
- Environmental Biology & Microbiology
- Invasive Plants
- Land Rehabilitation
- Soil & Water Science

### Degrees offered:

- **BS Environmental Sciences**  
Environmental Biology; Soil & Water Science
- **BS Land Rehabilitation**
- **BS Land Resource Sciences**  
Agroecology; Land Resources Analysis & Management
- **MS/PhD Land Resources & Environmental Sciences**
- **MS Land Rehabilitation** interdisciplinary

### Department of Land Resources and Environmental Sciences

334 Leon Johnson Hall  
P.O. Box 173120  
Bozeman, MT 59717-3120  
Phone: (406)994-7060  
Fax: (406)994-3933  
Email: [lresinfo@montana.edu](mailto:lresinfo@montana.edu)  
Website: <http://landresources.montana.edu>

## Veterinary Molecular Biology

Veterinary Molecular Biology (VMB) is a unique research/academic unit within the Montana University System. Laboratories in the VMB investigate a variety of important pathogens (viral, bacterial, and protozoan) and address basic questions of molecular virology, immunology, functional genomics and animal development. It is the vision and goal of VMB programs to explore fundamental processes of pathogens and their interactions with the animal host such that new therapies may be developed.

In this effort, researchers employ cutting-edge technology including functional genomics, animal transgenics, cell and molecular biology, and protein biochemistry to investigate the basic mechanisms of the pathogenesis of infectious disease. Undergraduate, graduate and postdoctoral students are integral to the research conducted by VMB faculty and have primary roles in research projects. VMB research and training programs are nationally recognized and funded by competitive grants from the National Institutes of Health, the National Science Foundation, the United States Department of Agriculture, as well as private foundations.

### VMB faculty research programs broadly include:

cellular mechanisms of immune responses, vaccine development through use of innovative delivery systems, gene regulation in viral, bacterial, and protozoan pathogens, molecular developmental processes in both animals and pathogens, cellular biochemistry and functional genomics.

### Degrees offered:

- BS Biotechnology
- BS Pre-veterinary Medicine Program
- MS/ PhD Veterinary Molecular Biology
- 2-year curriculum Pre-Veterinary Medicine Program

### Veterinary Molecular Biology

PO Box 173610  
Montana State University  
Bozeman, MT 59717-3610  
Phone: (406)994-4705  
Fax: (406) 994-4303  
Email: [zvs7004@montana.edu](mailto:zvs7004@montana.edu)  
Website: <http://vmb.montana.edu>

# The College of Agriculture

The College of Agriculture provides students with a broad range of outstanding academic programs focusing on land, water, animals, plants and people, exploring their interactions and how the study of each will enhance the industry.

## Majors

- Agricultural Business (BS)
- Agricultural Education (BS, MS)
- Agricultural Operations Technology (BS)
- Animal Science (BS)
- Animal & Range Science (MS, PhD)
- Applied Economics (MS)
- Biotechnology – interdisciplinary (BS)
- Entomology (MS)
- Environmental Sciences (BS)
- Horticulture (BS)
- Land Rehabilitation (BS,MS)
- Land Resource Sciences (BS)
- Land Resource & Environmental Science (MS, PhD)
- Plant Genetics (PhD)
- Plant Pathology (MS, PhD)
- Plant Science (BS, MS)
- Range Sciences (BS)
- Science Education – interdisciplinary (MS)
- Veterinary Molecular Biology (MS, PhD)

Approximately US\$400,000 in scholarships is awarded each year to students in the College of Agriculture!

## Career Opportunities

Graduates are well prepared for careers that range from farm and ranch management to environmental sciences and advanced biotechnology.

## Exciting Research Facilities

- MSU is home to the only biocontainment facility in the western United States for quarantining and testing insects and plant pathogens for the control of weeds and plant diseases.
- The College conducts research projects in various agricultural disciplines and environmental surveys at 8 Agriculture Research Centers across the state of Montana.
- The Plant Growth Center is a 60,000 square-foot teaching and research facility housing 29 glasshouse micro-computer controlled rooms, as well as insect and plant pathogen quarantine facilities.



## MONTANA STATE UNIVERSITY ♦ BOZEMAN

### Profile of Achievement

Oh Yong Ning "Denise" transferred to MSU from KDU College Penang, Malaysia two years ago to follow her dreams of studying Biotechnology. Since her arrival she has been extremely active in the Biotechnology department, as well as participating in many MSU campus activities and groups; including the MSU Dance Team and the Malaysian Student Organization. "The detailed structure of the biotechnology program at MSU offers many advantages for students, including professors who are ever ready to help and internships available throughout the year. I have learned a lot from the program that I feel will benefit me in the future especially as I search for job opportunities in this field."



### Marks of Excellence

The College of Agriculture at Montana State University-Bozeman provides a highly unique blend of academic programs that build upon foundation courses in the biological and social sciences. Students branch out into more specialized programmatic areas through our excellent advising efforts.

**Be the best by learning from the best!** The faculty are involved in cutting-edge research through state and federal support from the Montana Agricultural Experiment Station. Nothing can compare to an opportunity to have a world-class researcher involved with undergraduate and graduate education. The College of Agriculture enjoys award-winning faculty whose research ranges from the use of simple proteins to locate cancer in human cells to the study of hot-pool bacteria that might be useful in cleaning up toxic waste.

With US\$80 million in research expenditures for FY04, MSU is ranked by the National Science Foundation as one of the top 100 research universities in the country.

### Opportunities Beyond the Classroom

Experiential learning occurs with all majors through activities in the classroom, laboratory, field trips, internships, special projects, research experiences, and through the commitment of a highly regarded faculty and staff. Students are encouraged to explore contemporary issues that impact a complex and dynamic society working to find science-based and economically viable solutions to agricultural and natural resource management activities.

The **BioRegions Program** is one such example, working in neighborhoods and ecosystems around the world developing the concept of community citizenship and linking similar mountainous bioregions together while exchanging local knowledge and expanding global perceptions. For MSU students this is a chance to work in the complexity of communities rather than in a lab. It is also a chance to immerse themselves in other cultures that will be useful in the future as they deal with international agricultural policies, invasive species from around the world and global competition.

### College of Agriculture

202 Linfield Hall  
Montana State University  
PO Box 172860  
Bozeman, MT 59717-2860 USA  
Phone: (406) 994-3681  
Fax: (406) 994-6579  
Email: agweb@montana.edu  
Website: www.ag.montana.edu

### Office of International Programs

400 Culbertson Hall  
Montana State University  
Bozeman, MT 59717-2260 USA  
Phone: (406) 994-4031  
Fax: (406) 994-1619  
E-mail: globalstudy@montana.edu  
www.montana.edu/international