Biotechnology - Plant Systems programs 

Teach how to use scientific principles and technical skills in support of plant biotechnology research in industrial, academic and government settings. The program includes instruction in plant biology, creation and analysis of transgenic plants, cell culturing, protein purification, plant genetics, industrial microbiology, bioprocessing, chromatography and bio separation, genetic technology, laboratory skills and hazardous materials safety, and computer applications. The goal for this program is to promote research, education and technology transfer for the applications of plant biotechnology in order to benefit the agriculture. Completion of this program will lead to a B.S. degree or academia or the ability to continue on to graduate school in the plant sciences. The professors and staff in the program engage in teaching and research in areas such as cell, molecular, and developmental biology, biochemistry and genetics and the creation and analysis of transgenic plants. Majors have the opportunity through coursework, laboratories and research experience to develop the knowledge and skills necessary to enter into a career in biotechnology or to continue on to a graduate program.

Programs at Montana State University 

Combine traditional approaches of altering biological materials with the rapidly expanding methods of plant molecular biology. This option is for students with an interest in applying new technology to plant systems. Students in the Plant Biotechnology option concentrate on coursework specific to plant systems and are required complete an internship in a research setting on or off campus. Modern research in plant cellular and molecular biology and its resultant technology offers unparalleled opportunities to provide solutions to our society's most urgent problems in agriculture. The rapidly growing biotechnology industry is involved in developing products to increase agronomic yields, develop new and improved food crops, decrease dependence on nonrenewable resources, and improve food and fiber production. Students interested in plant biotechnology will find challenging careers in the diverse areas of biotechnology in either an academic or industrial setting. Students successfully completing a biotechnology curriculum will also be prepared to enter graduate school for further study. The Bachelor of Science in Biotechnology is an interdisciplinary degree offered by the College of Agriculture. Students will pursue a basic science curriculum the first two years and then choose an area of emphasis in plant, animal or microbial systems for the junior/senior years. Depending on the option chosen, students will be advised by participating faculty in the Colleges of Agriculture and Letters and Science.

Characteristics associated with success 

Include a strong interest in understanding why things work, curiosity about the logic and laws of nature, and a need to ask questions and find the answers.

You should:

- Enjoy and be skilled in mathematics and in science
- Enjoy working with plants and as part of a team
- Be logical and organized
- Be able to express yourself, both orally and in writing
- Be able to use a computer
- Be creative in problem solving
- Have good observational skills
- Be an active learner
- Have critical thinking skills
- Be an active listener
- Have sound judgment and decision making skills

Occupations in this field require ability to:

Have laboratory skills, deductive reasoning, originality, problem solving skills, professional ethics, communication skills, writing skills, and the knowledge of scientific literacy.

Related occupations include:

- Bioinformatics specialist
- Biotechnical scientist
- Consultant
- Biochemist
- Fisheries/Marine Biologist
- Pharmacologist (human and vet)
- Research associate
- Clinical research associate
- Industry researcher
- Ecologist
- Professor/Teacher
- Microbiologist
- Veterinarian
- Biophysicist
- Laboratory technician
- Health policy consultant
- Medical professional
- Food Science Technician
MSU graduates (Bachelor’s degree) were hired in the following selected fields:

Research Associate—Montana State University

Salary averages of survey respondents (# of respondents in parentheses):

Not enough information at this time*

In the field for “Soil and Plant Scientists” the lowest 10% of salaries for 2012 (comparable to new college graduate starting salaries) was $36,000 annually. The median wages in the nation in 2012 was estimated at $58,700 annually. In 2012 there were 16,300 positions nationally with an expected growth forecast of +8% through 2022. In 2012 the lowest 10% of salaries for the state of Montana (comparable to new college graduate starting salaries) was $31,000 annually. The median wages in Montana in 2012 was estimated at $47,000 annually. In Job openings in Montana and nationally are due to both growth and net replacement.

Graduates from this program entered programs of further education at these institutions:

Washington State University                         Texas A & M                      University of Idaho

Other Sources of Information:

College of Agriculture—Montana State University: College of Agriculture: www.montana.edu

*Insufficient Data: Each year the Career, Internship & Student Employment Services Office at Montana State University conducts a survey to determine placement rates and salary survey information from recent MSU graduates. Graduates were requested to participate in the survey to provide relevant information regarding the transition from college to career/graduate school. At times, there are limited or no respondents. Statistics, therefore, are not always based upon the response of the total sample group and are sometimes listed as “Insufficient Data.”