

CROP and WEED SCIENCES

The Crop and Weed Sciences (CWS) major in the Department of Plant Sciences is the study of grain and forage crop production, weed science, genetics, plant breeding, crop physiology and plant biotechnology. North Dakota is consistently the nation's leader for production of hard red spring wheat, durum wheat, barley, flax, dry edible beans, canola, dry peas, lentils and sunflower. North Dakota also ranks in the top 10 states for production of several other agronomic crops, including oat, rye, sugarbeet, and grass hay, and usually ranks third in total acreage of crops harvested. Income from sales of crops accounts for more than half of the North Dakota farmers' annual cash income. Crops utilized as livestock feed account for much of the cash income credited to livestock sales. Thus, North Dakota State University offers a setting well-suited for the study of crop and weed sciences.

Career Opportunities

Usually, more employment opportunities are available in CWS than there are qualified graduates. Producers require annual inputs such as seed, fertilizers and herbicides, so they seek assistance in sales or service areas such as crop consulting, chemical application and soil testing each year. Therefore, opportunities for CWS graduates usually have been more stable than in employment areas where inputs can be deferred when income is low. Also, salaries for CWS graduates are at or near the top among all graduates in agriculture due to the high demand for agronomists by many companies.

The employment opportunities in CWS can best be summarized by the jobs that our graduates have accepted. Our graduates have been employed as crop production consultants (agronomists); marketing experts for herbicides, fertilizers and other agricultural chemicals; managers of farm service centers for cooperatives and elevators; agents in the production and marketing of certified seeds; research technicians for private companies and universities; natural resources conservationists and agents for other governmental agencies; county agricultural extension agents; field representatives for sugarbeet or food processing companies; farm managers; farm insurance agents; research associates with private plant breeding companies; and persons involved in the reclamation of strip-mined land.

Typically 10 to 15 percent of the CWS graduates at NDSU return to farming or ranching and about 15 percent continue their studies to receive graduate degrees. The median starting salary for a CWS graduate with a bachelor's degree was \$45,000 with \$4,000 median bonus in 2018. In addition, many employers provide health and retirement benefits, and some provide a vehicle and cell phone.

Many employers hire undergraduate students as interns for the summer months, and some hire for the spring-summer semester or summer-fall semester periods. Several faculty hire students to help research activities, and the Department of Plant Sciences also sponsors summer interns with an expressed interest in graduate school. The opportunities for summer interns, beginning with students between their freshman and sophomore years, have exceeded the supply of students for several years. The salary for interns often exceeds the income for alternative summer jobs. An internship provides excellent work experience and often results in a graduating senior being hired earlier and with a higher salary than students without comparable experience.

Financial Aid and Scholarships

Loans, scholarships, grants and the work-study program are available through Financial Aid and Scholarships. Students requiring assistance may contact the Office of Financial Aid and Scholarships or One Stop.

The Department of Plant Sciences awards several scholarships for use during the freshman, sophomore, junior and senior years. Additionally, scholarships are awarded to freshmen students by the College of Agriculture, Food Systems, and Natural Resources prior to enrollment. Applications for all college and departmental scholarships may be applied for online between December 1 and March 1, annually. Also, many undergraduate students are employed part-time during the school year and full-time during the summer months to assist with research or teaching activities.

Extra-Curricular Opportunities

The department sponsors the Agronomy Club. The Agronomy Club invites industry and academic experts to speak about professional opportunities and activities at club meetings. The club also arranges trips to local agriculture businesses and arranges community outreach activities. The Agronomy Club participates in regional and national contests that involve crop production and weed science. And the club annually attends conventions to learn about several aspects of agriculture in the North Central region.

Curriculum Options

The department offers four options: agronomy, biotechnology, science and weed science. All students majoring or double majoring in CWS must meet the listed requirements. Students interested in a specific option will replace several of the elective courses listed in the sample curriculum with specific courses appropriate for that option.

Agronomy – This option is the most popular. It deals with the technical aspects of agricultural production and management. It provides the most elective credits, which allows students to select courses that complement special interests in farming, marketing, business management, county extension work, etc.

Biotechnology – This option is intended for students who wish to work as a technician or pursue graduate study in the crop biotechnology area.

Science – This option deals with the application of chemistry, botany, mathematics and physics to CWS. It is an excellent curriculum option for students intending to pursue a graduate degree in CWS.

Weed Science – This option, which emphasizes the proper use of herbicides and other agricultural chemicals, meets the demand for qualified personnel in the marketing and application of agricultural chemicals. Also, this option provides a good background for crop production consultants (agronomists) and plant protection careers. The greatest emphasis is placed on weed control, but additional courses in entomology, plant pathology and soil science are required.

In addition, some faculty in plant sciences advise students interested in the Biotechnology and General Agriculture majors. The Biotechnology major is an interdisciplinary program that stresses basic and applied science courses and lab experience to prepare students for employment in the biotechnology industry or for graduate study. The General Agriculture program exposes students to disciplines within agriculture for careers with diverse course needs. This exposure is strengthened through a selection of pertinent coursework in a minimum of four discipline areas.

Crop and Weed Science Plan of Study

Please note this is a sample plan of study and not an official curriculum. Actual student schedules for each semester will vary depending on start year, education goals, applicable transfer credit, and course availability. Students are encouraged to work with their academic advisor on a regular basis to review degree progress and customize an individual plan of study.

| First Year | | | |
|---|----------------|--|----------------|
| Fall | Credits | Spring | Credits |
| PLSC 189 Skills for Academic Success | 1 | SOIL 210 Introduction to Soil Science | 3 |
| PLSC 110 World Food Crops | 3 | BIOL 151 General Biology II | 3 |
| BIOL 150 General Biology I | 3 | BIOL 151L General Biology II Laboratory | 1 |
| BIOL 150L General Biology I Laboratory | 1 | ENGL 120 College Composition II | 3 |
| ENGL 110 College Composition I | 4 | Gen Ed Social & Behavioral Sciences | 3 |
| MATH 103 College Algebra | 3 | Gen Ed Wellness | 2 |
| | 15 | | 15 |
| Second Year | | | |
| Fall | Credits | Spring | Credits |
| PLSC 215 Weed Identification | 1 | PLSC 225 Principles of Crop Production | 3 |
| PPTH 324 Introductory Plant Pathology | 3 | PLSC 312 Expanding the Boundaries of Learning with Service | 1 |
| CHEM 121 General Chemistry I | 3 | MICR 202 Introductory Microbiology | 2 |
| CHEM 121L General Chemistry I | 1 | MICR 202L Introductory Microbiology Lab | 1 |
| COMM 110 Fundamentals of Public Speaking | 3 | CHEM 122 General Chemistry II | 3 |
| Gen Ed Humanities & Fine Arts/Gen Ed Cultural Diversity | 3 | CHEM 122L General Chemistry II Laboratory | 1 |
| Free Elective | 2 | ECON 201 Principles of Microeconomics | 3 |
| | 16 | STAT 330 Introductory Statistics | 3 |
| | | | 17 |
| Third Year | | | |
| Fall | Credits | Spring | Credits |
| PLSC 320 Principles of Forage Production | 3 | PLSC 315 Genetics | 3 |
| ENT 350 General Entomology | 3 | PLSC 315L Genetics Laboratory | 1 |
| CHEM 240 Survey of Organic Chemistry or BOT 460 Plant Ecology | 3 | PLSC 323 Principles of Weed Science | 3 |
| Gen Ed Humanities & Fine Arts | 3 | SOIL 322 Soil Fertility and Fertilizers | 3 |
| Free Elective | 3 | PLSC 380 Principles of Plant Physiology | 3 |
| | 15 | Free Elective | 3 |
| | | | 16 |
| Fourth Year | | | |
| Fall | Credits | Spring | Credits |
| PLSC 444 Applied Plant Breeding and Research Methods | 3 | PLSC 455 Cropping Systems: An Integrated Approach | 3 |
| PLSC upper level elective | 2 | PLSC 491 Seminar | 1 |
| PLSC upper-level elective | 2 | Free Elective | 3 |
| ENGL 320 Business and Professional Writing or 321 Writing in the Technical Professions or 324 Writing in the Sciences | 3 | Free Elective | 3 |
| Free Elective | 3 | Free Elective | 3 |
| | 13 | | 13 |
| Total Credits: 120 | | | |

View NDSU equivalencies of transfer courses at: www.ndsu.edu/transfer/equivalencies

For Further Information

MAILING ADDRESS: Crop and Weed Science | NDSU Dept 7670 | PO Box 6050 | Fargo, ND 58108-6050
DEPT LOCATION: Loftsgard Hall
DEPT EMAIL: ndsu.plantsciences@ndsu.edu
DEPT PHONE: (701) 231-7971
DEPT WEBSITE: www.ag.ndsu.edu/plantsciences/undergraduate/crop-weed

This publication will be made available in alternative formats upon request. Contact the Office of Admission (701) 231-8643 or 800-488-NDSU or ND Telecommunications Relay Service 800-366-6888 (TTY) or 800-366-6889 (voice).

NDSU is an equal opportunity institution. 7/20