Crop and Weed Science

Department Information

- **Department Web Site:**
  www.ag.ndsu.edu/plantsciences (http://www.ag.ndsu.edu/plantsciences/)
- **Credential Offered:**
  B.S.; Minor
- **Official Program Curriculum:**
  catalog.ndsu.edu/undergraduate/program-curriculum/crop-weed-science/ (http://catalog.ndsu.edu/undergraduate/program-curriculum/crop-weed-science/)

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 5 to 10 percent continue their studies to receive graduate degrees. The median starting salary for a CWS graduate with a bachelor's degree was $50,000 in 2021. In addition, benefits packages that include health, dental and retirement are very competitive, signing bonuses and performance bonuses might be available, and some provide a vehicle and cell phone.

Many employers hire undergraduate students as interns for the summer months, and some hire for spring-summer semester or summer-fall semester periods. Several faculty hire students to help with 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 is competitive with the income for alternative summer jobs, and the strong market has resulted in wage rates as high as $22/hr with signing bonuses and some employers pay potential internship fees if taken for summer term credit. 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, certain scholarships are awarded by the College of Agriculture, Food Systems, and Natural Resources. 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 NDSU 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.

There are nearly 300 other Clubs and Organizations available at NDSU. Many of these focus around a discipline or interest area, such as Agronomy club and the disciplines and professions encompassed by the CWS major. But you are not required to be in the major or minor to join the Agronomy Club. We welcome all students with an interest in Agronomy to join us whether you have background in crop production or just want to find out more about crop production and the industry opportunities.

CWS Major curriculum Options

The department offers four options in the CWS major: agronomy, biotechnology, science and weed science. This is an emphasis or track as part of the CWS major to allow refinement in the direction of each students career preparation. All students majoring or double majoring in CWS must meet the listed requirements for the core CWS program and one selected option. 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 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. The additional science and math component also provides good training for students pursuing careers in analysis and residue testing of soil, water, and plant tissue samples.
- Weed Science – This option, which emphasizes proper use of herbicides and other agricultural chemicals, meets the demand for qualified personnel in 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 selection of pertinent coursework in a minimum of four discipline areas.

cws minor

Any NDSU student with a major other than CWS can elect the CWS minor. The minor includes 18 credits of coursework and includes the foundation courses in crops and production practices with broad flexibility to explore specific crop production, pest management, soil aspects, or seed trait and genetics courses. The CWS minor will give familiarity with terms and practices within crop production to assist student preparation in a related discipline. Sales and marketing managers of agronomic inputs or commodities, publication or promotion firms writing about or for Agriculture industries, animal operations that need forages an crops for feed, or soil conservationists wo need to consider acceptable farming practices to meet Farm Bill criteria and stipulations are among the individuals and situations where the CWS minor would provide good supplement to another major.

Sample Program Guide

IMPORTANT DISCLAIMER: A Sample Program Guide provides an unofficial guide of program requirements and should be used by prospective students who are considering attending NDSU in the future. It is NOT an official curriculum and should NOT be used by current NDSU students for official degree planning purposes. Note that the official curriculum used by current NDSU students can vary from the Sample Program Guide due to a variety of factors such as, but not limited to, start year, education goals, transfer credit, and course availability.

To ensure proper program completion, enrolled students should utilize Degree Map (https://www.ndsu.edu/registrar/degreemap/) and Schedule Planner (https://www.ndsu.edu/onestop/degree-map-and-planning/) in Campus Connection and consult regularly with their academic advisor to ensure requirements are being met.

First Year			
Fall	**Credits**	**Spring**	**Credits**
PLSC 189	1	BIOL 151	3
PLSC 110	3	BIOL 151L	1
BIOL 150	3	ENGL 120	3
BIOL 150L	1	Gen Ed Social & Behavioral Sci	3
ENGL 110	3	Gen Ed Wellness	2
MATH 103	3	Free Elective	3
	14		**15**

Second Year				
Fall	**Credits**		**Spring**	**Credits**
PLSC 215		1	PLSC 225	3
PPTH 324		3	PLSC 312	1
CHEM 121		3	MICR 202	2
CHEM 121L		1	MICR 202L	1
COMM 110		3	CHEM 122	3
Gen Ed Humanities/Fine Arts & Cult Diversity		3	CHEM 122L	1
SOIL 210		3	ECON 201	3
			STAT 330	3
		17		**17**
Third Year				
Fall	**Credits**		**Spring**	**Credits**
PLSC 320		3	PLSC 315	3
ENT 350		3	PLSC 315L	1
Gen Ed Humanities/Fine Arts		3	PLSC 323	3
CHEM 240, BIOL 461, or BIOC 260 (BIOC 260 is spring course with prerequiite CHEM 140 in fall)		3	SOIL 322	3
Free Elective		3	PLSC 380	3
			Free Elective	3
		15		**16**
Fourth Year				
Fall	**Credits**		**Spring**	**Credits**
PLSC 444		3	PLSC 455	3
PLSC upper level elective		2	PLSC 491	1
PLSC upper level elective		2	Free Elective	3
Gen Ed Upper Level Writing (recommend ENG 320, 321, or 324)		3	Free Elective	3
Free Elective		3	Free Elective	3
		13		**13**

Total Credits: 120