

LECTURE OUTLINE
PLANT SCIENCES 453/653 : ADVANCED WEED SCIENCE
FALL SEMESTER 1999

Course description: Integrated weed control programs for crops, pastures, noncropland, and aquatic environments. Herbicide formulation and mixtures. Herbicide absorption, translocation, and action.

Course objectives:

1. To increase understanding of factors affecting use and integration of biological, cultural, chemical and physical control of weeds.
2. To increase understanding of biological characteristics of weeds and their seeds that affect current and future decisions concerning weed management.
3. To increase understanding of factors affecting dissipation of herbicides from the environment.
4. To increase understanding of factors affecting effective chemical weed control, including management of herbicide-resistant weeds, optimizing effectiveness of postemergent herbicides, and utilizing reduced herbicide rates.

General lecture topics

I. Techniques of weed management

- A. Introduction
- B. Preventive weed control
- C. Biological weed control
- D. Cultural weed control
- E. Physical weed control

II. Characteristics of weeds

- A. Life cycles
- B. Propagation of weeds
- C. Number and persistence of weed seeds
- D. Dormancy and germination
- E. Competitive traits of weeds
- F. Weed dissemination
- G. Perspectives on weed interference in crops

III. Herbicides in the environment

- A. Soil aspects
- B. Methods of herbicide dissipation
- C. Herbicide persistence and degradation in soil
- D. Herbicides in the atmosphere
- E. Summary of factors affecting spray drift
- F. Herbicides in water

IV. Herbicide-resistant weed management

- A. Types of resistance
- B. Examples of herbicide-resistant weeds in the region
- C. Factors associated with development of resistance
- D. Strategies to "avoid" herbicide-resistant weeds
- E. Genetic aspects of herbicide-resistant weed management

V. Factors affecting postemergent herbicide efficacy

- A. Examples of factors affecting postemergent herbicide efficacy
- B. General scheme for the interaction of factors affecting POST herbicid
- C. Physical and chemical characteristics of the spray mixture
- D. Factors affecting herbicide retention and spray residue formation
- E. Factors absorption at the spray deposit-plant interface
- F. Adjuvants with herbicides

VI. Reduced herbicide rates

- A. Reasons for using reduced rates
- B. Ways to achieve reduced herbicide inputs
- C. Increased management required to utilize reduced herbicide rates
- D. Potential disadvantages of using reduced herbicide rates

Lecture guide: Plant Sciences 453/653 Lecture Guide
(Available at Varsity Mart)

Lectures: Loftsgard 102, 12:30 - 1:20 p.m., Tuesday and Thursday

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About four short lecture examinations will be given; about one at the end of each section of the lecture guide. Each day of lecture will be worth about 20 points, so the number of points on each examination will vary with the number of lectures (circa 50 minutes per lecture) covered by the examination. The time for each examination will equal about 5 minutes per day of lecture covered by the examination. Thus, a short examination that covers 6 lectures will equal 120 points and 30 minutes will be allowed to complete the examination. An examination will occur about every third week, and most likely on Tuesday. Also, a **comprehensive final examination** of 200 points will be given at the end of the semester. Most questions will be written answer/short essay questions, but use of other examination question formats is not excluded.

In addition, there will be "1 minute quizzes" and "take home assignments" that will vary from 1 to perhaps 10 points per activity.

Graduate students will be required to complete supplemental activities, including a literature review and writing or special projects to fulfill the requirements for PLSC 653. These activities will add about 200 points to the course total for graduate students. Also, the graduate student examinations will be evaluated separate from the undergraduate student examinations.

Make-up of missed examinations should be scheduled as soon as possible after an examination is given.

Course grading: Course grades will be based on the total possible points accumulated during the semester; PLSC 453 will have about 850 points and PLSC 653 will have about 1050 points.

Final course grades will be guaranteed based on the scale below:

<u>Grade</u>	<u>Percentage of total points for the course</u>
A	90% and above
B	80 through 89%
C	70 through 79%
D	60 through 69%
F	Less than 60%

Students with disabilities are asked to inform the instructor; for example, visual impairment, hearing deficiency, dyslexia, writing impairment, etc. Then, arrangements can be made, in cooperation with the office of Disability Services, to provide appropriate services.

Honor Code: Examinations are given according to the policies of the Honor System within the College of Agriculture. Students are expected to neither give nor receive aid on examinations or other assignments that are to be completed as individuals. University guidelines for academic honesty are outlined in NDSU University Senate Policy, Section 355: Code of Academic Responsibility and Conduct (<http://www.nodak.edu/policy/355.htm>).