

AGRN 377
Crop Ecology and Management
Spring 2020

I. General Information

AGRN 377 (CROP ECO MNGT) is a 4 credit hour course that explores grain and forage crops response to climate and management of soil and water resources, and crop management practices that maximize productivity and minimize environmental impact.

Prerequisite: AGRN 176 – Principles of Crop Science.

Desired: AGRN 278 – Introduction to Soil Science

Lecture: MTuWTh 1:00-1:50 a.m., Knoblauch 152

Instructor: Dr. Mark Bernards
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Office Hours: M 12:00-12:50 p.m.; T 11:00-11:50 a.m., W 2:00-2:50 a.m., Th 9:00-9:50 a.m. or by appointment.

Required Texts:

Nafziger, E. (Editor). 2009. Illinois Agronomy Handbook, 24th edition. University of Illinois Extension C1394. Available for download at <http://extension.cropsci.illinois.edu/handbook>

Abendroth, L.J., R.W. Elmore, M.J. Boyer and S.K. Marlay. 2011. Corn Growth and Development. Iowa State University Extension PMR 1009.

Pedersen, P. 2009. Soybean Growth and Development. Iowa State University Extension PM 1945.

Undersander, D., et al. 2011. Alfalfa Management Guide. American Society of Agronomy-Crop Science Society of America-Soil Science Society of America, Madison, WI. Available for download at <https://www.crops.org/files/publications/alfalfa-management-guide.pdf>

Other readings will be made available through Western Online or the Internet.

Other texts that will be used in the development of lectures and which may be good references for you: Barnes, R.F., C.J. Nelson, M. Collins and K.J. Moore. 2003. Forages, Volume 1: An Introduction to Grassland Agriculture. Iowa State Press, Ames, Iowa.

Connor, D.J., R.S. Loomis, K.G. Cassman. 2011. Crop Ecology: Productivity and Management in Agricultural Systems, 2nd edition. Cambridge University Press, Cambridge, England.

Martin, J.H., R.P. Waldren, D.L. Stamp. 2006. Principles of Field Crop Production. Pearson, Upper Saddle River, New Jersey.

Stoller, P. 2012. Growth Stages of Agronomic Crops. University of Illinois X905.

II. University Policies and Expectations

Student rights and responsibilities: A complete description is available at www.wiu.edu/provost/students.

Disruptive Student Policy: Students who interfere with normal class function or the ability of other students to learn may be asked to leave the class for the day. For repeated offenses, a student may be removed from the course. Details may be found at: <http://www.wiu.edu/vpas/policies/disrupst.php>

Two dismissals due to disruptive or unprofessional behavior will result in a permanent disbarment from the course and a final grade of "F" will be assigned.

Academic Integrity: <http://www.wiu.edu/policies/acintegrity.php> Western Illinois University, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. . . It is the student's responsibility to be informed and to abide by all University regulations and policies on Academic Integrity. Plagiarism, cheating, and other forms of academic dishonesty constitute a serious violation of University conduct regulations. Students who engage in dishonesty in any form shall be charged with academic dishonesty. . . Any student, faculty member, or staff person who has witnessed an apparent act of student academic dishonesty, or has information that reasonably leads to the conclusion that such an act has occurred or has been attempted, has an ethical responsibility for reporting said act(s).

The policy for AGRN 377: Any confirmed act of academic dishonesty (especially plagiarism, cheating, copying another students assignment or allowing another student to copy yours) will result in the loss of all points associated with that assignment, and may result in an "F" for the course.

Equal Opportunity: <http://www.wiu.edu/policies/affirmact.php> Western Illinois University complies fully with all applicable federal and state nondiscrimination laws, orders, and regulations. The University is committed to providing equal opportunity and an educational and work environment for its students, faculty, and staff that is free from discrimination based on sex, race, color, sexual orientation, gender identity and gender expression, religion, age, marital status, national origin, disability, or veteran status.

Sex-Discrimination and Misconduct: University values, Title IX, and other federal and state laws prohibit sex discrimination, including sexual assault/misconduct, dating/domestic violence, and stalking. If you, or someone you know, has been the victim of any of these offenses, we encourage you to report this to the Title IX Coordinator at 309-298-1977 or anonymously online at: http://www.wiu.edu/equal_opportunity_and_access/request_form/index.php. If you disclose an incident to a faculty member, the faculty member must notify the Title IX Coordinator. The complete Title IX policy is available at: <http://www.wiu.edu/vpas/policies/titleIX.php>

Disabilities: Students with disabilities: In accordance with University values and disability law, students with disabilities may request academic accommodations where there are aspects of a course that result in barriers to inclusion or accurate assessment of achievement. To file an official request for disability-related accommodations, please contact the Disability Resource Center at 309-298-2512, disability@wiu.edu or in 143 Memorial Hall. Please notify the instructor as soon as possible to ensure that this course is accessible to you in a timely manner.

Education Majors: The Illinois State Teaching license requires all education majors to receive a grade of a "C-" or better in this course to meet its requirements.

III. Course Expectations and Policies

1. Live the Golden Rule. Treat others with respect and courtesy in your conversation and actions. Turn off and put away electronic devices (smartwatches, phones, tablet computers, laptop computers, etc.) during the class period unless directed to use them for class activities. Inappropriate use of an electronic device will result in loss of participation points for that day.
2. Show up. Attendance and punctuality is expected. Notify the instructor in advance if you have any reason to miss a class period through the O.A.R.S system (<http://wiu.edu/oars>). A minimum of 24 h notice (email or phone) is required if there is any cause to miss a quiz or exam. If you do miss a class, do not ask the instructor "Did I miss anything important?" It is your responsibility to make arrangements to get the information you missed and to make up any missed assignments.
3. Participate. Be prepared for class discussions by completing readings, answering questions, taking notes, asking questions, and working effectively with other students on lecture and laboratory activities.
4. Study. You should plan to spend a minimum of 8 hours outside of class each week to master the material. Reading assignments relating to each lecture/lab will be particularly beneficial.
5. Complete assignments. Assignments not turned in on the assigned date may have 10% of the total

potential points deducted for each day after the due date. The instructor will generally return exams and assignments within 1 week.

6. The use of tobacco is prohibited in Knoblauch Hall, nor is it allowed during sessions at the AFL.

IV. Grading

<u>Component</u>	<u>Portion*</u>
Attendance	10%
Preparedness	5%
Assignments	25%
Quizzes & Final Exam	60%

**These percentages are subject to modification. However, any changes will be discussed during class lecture prior to being implemented.*

Grading Scale

<u>Percentage</u>	<u>Grade</u>	<u>Percentage</u>	<u>Grade</u>
93.0-100	A	73.0-76.9	C
90.0-92.9	A-	70.0-72.9	C-
87.0-89.9	B+	67.0-69.9	D+
83.0-86.9	B	63.0-66.9	D
80.0-82.9	B-	60.0-62.9	D-
77.0-79.9	C+	<59.9	F

V. Learning Assessments

Attendance: Attending class is expected and will improve your ability to learn the material and to contribute to the classroom community. Each student will be allowed 3 “vacation” days (for funerals, interviews, oversleeping, etc). More than 3 “vacation” absences will result in the loss of attendance percentage points (2 points per absence). Absence for WIU-sanctioned activities (i.e., team travel, presenting at conferences, etc.) will not count against “vacation” days. Absence due to illness will be evaluated on a case-by-case basis and will not count against the vacation days. Students who accumulate 10 or more “vacation days” will NOT receive a passing grade.

Preparedness: Preparedness will be assessed through Western Online quizzes or pop quizzes or writing assignments at the beginning of a class period

Assignments: There will be assignments associated with lecture topics that will be designed to help you better understand the material and benefit from resources you can use after you graduate from WIU. Assignments will be graded on completeness and/or accuracy.

Quizzes/Exams:

1. A 20-30 question quiz will be given during part of a class period approximately once every two weeks. It may include multiple choice, fill in the blank, true-false, matching and short essay questions.
2. Final Exam: The final exam will be comprehensive, and will include multiple choice, matching, fill in the blank, true-false and short essay questions.

VI. Course Objectives

This course will prepare you to make many of the decisions necessary for growing crops in the Midwest, either as a producer or as a crop advisor. At the end of the class it is expected that you will be able to answer many of the questions in the “Crop Management Performance Objectives” for the International Certified Crop Advisor Exam” <https://www.certifiedcropadviser.org/files/certifiedcropadviser/international-performance-objectives.pdf>.

Foundational Knowledge

1. Define the services society expects agroecosystems to provide
2. Define plant growth and development and the environmental factors that influence each.
3. Describe characteristics of effective on-farm research trials and how to interpret data obtained from such trials
4. Describe the difference between climate and weather and define weather variables that influence crop productivity
5. Describe genetic resources available to improve crop productivity and how those resources are used to develop new varieties
6. Describe how soil management practices (tillage, drainage, pH, nutrient management, etc.) influence crop growth and productivity
7. Explain how cropping practices (crop rotation, seed quality, planting date, row spacing, plant population, planting depth, use of precision agriculture, etc.) affect crop growth and productivity
8. Explain factors that favor successful harvest and storage of corn, soybean and alfalfa
9. Define risk management related to crop production and tools available to farmers to manage that risk

Application

10. Identify corn, soybean, wheat and alfalfa growth stage based on plant appearance
11. Calculate weather variables that influence plant growth and development
12. Select corn and soybean varieties appropriate for different farming environments and risk management scenarios
13. Identify market forces that influence agronomic decisions
14. Determine when replanting a crop is most likely to result in improved profitability

Integration

15. Recommend management practices for corn and soybean based on plant growth stage
16. Design a valid on-farm research project to evaluate the benefit of a practice or treatment
17. Diagnose cropping problems from images and descriptions

Human Dimension

18. Explain potential reasons for societal reluctance to accept genetic engineering
19. Identify factors that drive farmer decisions regarding crop rotation and cultural management

Caring

20. Understand factors contributing to climate change and its potential influence on agriculture systems in the Midwestern U.S. and elsewhere in the world
21. Identify ways that agroecosystem management may be adjusted to improve environmental quality

Learning to Learn

22. Use resources of National Oceanic and Atmospheric Administration and state climatologists or agriculture mesonets to obtain weather information and understand climatic patterns
23. Use USDA statistical services to understand cropping practices and productivity
24. Use data from university, company or on-farm research to identify crop management practices that would benefit crop productivity

VIII. Probable Sequence of Course Content

Lecture Quizzes

Date	
Jan 27	Quiz 1
Feb 10	Quiz 2
Feb 24	Quiz 3
Mar 17	Quiz 4
Mar 31	Quiz 5
Apr 14	Quiz 6
Apr 28	Quiz 7
May 6	Final Exam, 1 p.m.

Class exceptions

Date	
Mar 2	Online lecture
Mar 3	Online lecture
Mar 4	Online lecture
Mar 5	Online lecture

Topical sequence

Unit	Topic
1	Agroecosystems terminology and services
2	Plant Growth and Development
3	Commodity supply and demand and its influence on cropping decisions
4	On-farm research and data interpretation
5	Crop response to weather conditions and the influence of climate in crop management
6	Genetic resources, genetic engineering and variety selection
7	Soil management for healthy root zones and adequate water supply for plants
8	Cropping management practices to optimize sustainability
9	Understanding risk management and its role in creating sustainable agricultural systems
10	Harvest and storage