

AGRONOMY 370
NO-TILLAGE FARMING
Spring 2023

I. General Information

AGRN 370 (NO-TILL FARM) is a 2 credit hour course that explores environmental benefits from no-tillage crop production, the influence of microclimatic factors on the success of crop plants in no-tillage fields, and management tactics to increase the productivity and environmental benefits of no-tillage farming.

Lecture: MW 2:00-2:50 p.m., Knoblauch Hall 305

Prerequisites: AGRN 176 – Principles of Crop Science.
AGRN 278 – Introduction to Soil Science

Instructor: Dr. Mark Bernards
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Office Hours: M, Th 11:00-11:50 a.m.; T, Th 1:00-1:50 p.m. or by appointment.

Required Texts:

1. Hilshey B Bench C (2020) A Practical Guide to No-till and Cover Crops in the Mid-Atlantic. North Jersey RC&D. PDF available at: <https://northeast.sare.org/resources/a-practical-guide-to-no-till-and-cover-crops-in-the-mid-atlantic/>
2. Brown G (2018) Dirt to Soil. One Family's Journey into Regenerative Agriculture. Chelsea Green, White River Junction, Vermont.
3. Montgomery DR (2012) Dirt: The Erosion of Civilizations. University of California Press, Los Angeles, California.
4. Baker CJ Saxton KE Ritchie WR Chamen WCT Reicosky DC Ribeiro MFS Justice SE Hobbs PR (2007) No-tillage Seeding in Conservation Agriculture, 2nd Edition. Food and Agriculture Organization of the United Nations and CAB International, Wallingford, OX, United Kingdom. (*PDF downloadable from Western Online*).

Reference Texts:

5. Hilshey B Bench C (2022) No-till & Cover Crops Handbook. Lessiter Media Inc., Brookfield, WI. Available at https://www.no-tillfarmer.com/notill_cover_crop_handbook_29_95 for \$29.95 + Shipping.
6. Reeder R et al. (2000) Conservation tillage systems and management, MWPS-45, 2nd edition.
7. Coughenour CM Chamala S (2000) Conservation tillage and cropping innovation. Iowa State University Press, Ames, IA.
8. Montgomery DR (2017) Growing a Revolution: Bringing Our Soil Back to Life. W.W. Norton & Company, New York.

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 370: Any confirmed act of academic dishonesty (especially plagiarism, cheating, copying another person's assignment or allowing someone to copy yours) will result in the loss of all points associated with that assignment, and may result in an "F" for the course. Acts of academic dishonesty are reported to the WIU Registrar and become part of a student's academic record.

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 attendance 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 and engage by taking notes, answering questions, asking questions, and working effectively with other students on activities.
4. Study. You should plan to spend 4 hours outside of class each week to master the material. Reading assignments relating to each lecture 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.
7. Students must wear sturdy, close-toed to participate at the AFL. The wearing of long pants is highly recommended.

IV. Course Objectives

Foundational Knowledge

1. Define the causes, types and consequences of soil erosion.
2. Describe the range of practices popularly referenced as “no-tillage” and justify/critique these practices for appropriateness in accomplishing the aims of no-tillage
3. Describe the economic and environmental benefits of no-tillage.
4. Explain the economic and environmental risks associated with no-tillage.

Application

5. Measure how the physical characteristics of a no-tillage field differ from a tilled field.
6. Develop guidelines to manage soil fertility in no-tillage fields.
7. Identify weed, disease, insect and vertebrate management challenges unique to no-tillage and suggest practices to minimize those risks.

Integration

8. Critique different planter systems for sowing seed in no-tillage fields.
9. Devise practices that complement no-tillage to increase soil health.

Human Dimension

10. Identify characteristics of farmers willing to implement and maintain no-tillage practices.
11. Explain social factors that influence the adoption of radical¹ new technologies.

Caring

12. Articulate the importance of healthy soils in a sustainable agroecosystem and become a lifelong advocate for practices that improve the quality of soils.

Learning to Learn

13. Interpret data measuring the effects of management practices on soil properties and crop growth.
14. Make recommendations for practices to adopt based on interpretation of charts, figures and tables published from scientifically valid studies (replicated and statistically analyzed).
15. Become familiar with peer review, Extension, and commercial media resources promoting no-tillage farming.

V. Grading

<u>Probable Grade components</u>	<u>Portion</u>
Attendance	7%
Self-Assessment	18%
Assignments	25%
Quizzes/Exams	50%

¹ Marked by a considerable departure from the usual or traditional: EXTREME (Webster's Ninth Ne Collegiate Dictionary)

Grading Scale

Percentage	Grade	Percentage	Grade
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

VI. Learning Assessment

Attendance/Participation: Attending class and contributing to classroom discussions is expected and will improve your ability to learn the material. Each student will be allowed 2 “vacation” days (for funerals, interviews, etc). More than 2 “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 7 or more “vacation days” will NOT receive a passing grade.

Self-Assessment: Students will be asked to assess their performance in the class for the following criteria: 1) contribution to a healthy classroom community; 2) improvement in knowledge/skills/ability to address course objectives; 3) disciplined effort to fulfill class requirements (readings, assignments, etc.). Assessments will be administered at the beginning, mid-term and conclusion of the semester.

Assignments:

1. One major project will be to read portions of *Dirt: The Erosion of Civilizations* and *Dirt to Soil: One Family’s Journey into Regenerative Agriculture*. There will be reading quizzes at Western Online and class discussions on the chapters.
2. We plan to have 7 or 8 guest lecturers from no-tillage farmers or professionals who support farmers. You will be asked to write a reflection essay after each presentation.
3. There will be occasional quizzes at the beginning of class to assess your understanding of assigned readings.
4. There will be other 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.

Quizzes/Exams:

1. Midterm Exams: Exams will be given approximately every four weeks and will review material covered in the lectures. They will include multiple choice, true-false, fill in the blank, and short essay questions.
2. Final exam. Multiple choice, true-false, fill in the blank, and short essay questions to assess your competency of the course objectives.

VII. Probable Course Calendar

Date	Topic. Assignment Due.	Reading due
Jan 18	Lec 1. What is your no-till story?	
Jan 23	Lec 2. What is the role of tillage?	https://cropwatch.unl.edu/tillage <i>Gruver and Wander: Use of tillage in organic farming systems</i> <i>Baker et al. No-tillage seeding in conservation agriculture, pp. 1-5</i>
Jan 25	Lec 3. Agriculture, tillage and erosion.	Required: Lowdermilk, <i>Conquest of the Land through Seven Thousand Years</i> . Supplemental material used to update