COVER CROP ESSENTIALS
Fall 2024 Pilot

Course Description

Cover crops can be a great tool for farmers interested in preventing erosion and improving soil health. With recent increases in public and private funding for cover crop implementation, more farmers are expected to try cover crops for the first time. Cover crops are not a new practice but in recent decades, lessons learned from research and on-farm innovation can help farmers maximize the benefits from cover crops. In this course, we will explore the latest research and innovation that can help farmers make informed decisions whether they are trying cover crops for the first time or are interested in experimenting with a new cover crop species or new seeding method. This course is an opportunity for professionals to develop their capacity to support farmers in cover crop implementation across a range of Midwest cropping systems.

This will consist of 9 weeks of instruction. Each week, there will be lectures to watch on your own time with quizzes to check for comprehension. Students have the opportunity to post questions in a discussion board and there will be optional readings related to the lecture topics. Every other week, the cohort will meet by Zoom to discuss the lecture topics and to receive instruction necessary to complete the lab activities.

Instructor

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Learning Outcomes

1. Define cover crop types. Describe characteristics of cover crop species and functional groups and their ecosystem services.
2. Manage and make decisions about cover crops across a diversity of climates, soils, and cropping systems.
3. Quantify the agroecosystem impacts of cover crops using digital tools and describe how cover crop benefits are influenced by management decisions across environments.
4. Measure the short- and long-term economic impacts of cover crop management decisions.
5. Apply cover crop system knowledge to design policy and social initiatives to help overcome barriers to cover crop adoption.
6. Locate resources and find relevant information and integrate when making decisions: integrate available decision support tools.

Course Schedule (DRAFT- subject to change)

Aug 2 ZOOM INTRO- Course Kickoff

UNIT 1

Week 1 Cover Crops Basics (90 min)

1.1 Definition and history of cover crops, Matt Ryan, Cornell	12:34
1.2 Trends in Adoption, Matt Ryan, Cornell	15:05
2.1.1 Benefits, Matt Ryan, Cornell	19:57
2.1.2 Benefits, Matt Ryan, Cornell	23:30
2.2 Functional Groups, Matt Ryan, Cornell	23:42

Aug 9 ZOOM SESSION 1

- Unit 1 Lab Assignment: Cover Crop Test Plot Worksheet

UNIT 2

Week 2 Cover Crop Management (57 min)

3.1 Selection and Establishment, Karen Renner, MSU	25:38
3.2 Seeding Methods for Cover Crops, Karen Renner, MSU	31:52

Week 3 Cover Crop Management (59 min)

4.1 Seeding Rates for CC, Karen Renner, MSU	25: 20
4.2 Cover Crop Termination, Karen Renner, MSU	33:20

Aug 23 ZOOM SESSION 2

- Unit 2 Lab Assignment: Test Plot Emergence and Figuring Seeding Rate

UNIT 3

Week 4 Mixtures and Herbicides (63 min)

5.1.1 CC Mixtures Seeding Rates, Karen Renner and Dean Baas, MSU	45:57
5.1.2 Evaluating CC Mixtures, Karen Renner and Dean Baas, MSU	
5.2 Herbicides and CC, Karen Renner, MSU	17:48

Week 5 Soil Properties (78 min)

7.2 SOM and Carbon, Dara Park, Clemson	15:12
7.5 Soil Physical Properties and Cover Crops, Karen Renner, MSU	28:02
7.3.SUPP Soil Physical Health- Compaction and Erosion, Dara Park, Clemson	15:22
7.4.SUPP Soil Physical Health- Aggregation and Water Management, Dara Park, Clemson	19:38

Sept 13 ZOOM SESSION 3

BREAK Sept 13- Oct 25

UNIT 4

Week 6 CC and Nutrient Cycling (87 min)

9.1 Nitrogen, Kate Tully, Univ of Maryland	20:03
9.2 Phosphorus, Kate Tully, Univ of Maryland	18:31
9.3 Water Quality, Kate Tully, Univ of Maryland	18:30
9.5 N and P Continued, Karen Renner, MSU	30:24
9.SUPP OPTIONAL Nutrient Cycles	

Week 7 CC Ecosystem Services (78 min)

8.1 Beneficial Organisms, Rich Smith, Univ of New Hampshire	23:55
8.2 Weed Suppression, Rich Smith, Univ of New Hampshire	26:40
8.3 Disservices, Rich Smith, Univ of New Hampshire	17:14
8.4 Assessing Multifunctionality and Tradeoffs, Rich Smith, Univ of New Hampshire	10:04

Nov 8 ZOOM SESSION 4

- Unit 4 Lab Activity: Evaluate cover crop plot ecosystem services

UNIT 5

Week 8 CC Economics (92 min)

11.1 CC Economics	32:02
11.2 CC Economics	34:10
Special Topic: CC Grazing, Kim Cassida, Michigan State University	25:19

Week 9 CC Adoption and Barriers (51 min)

12.1 CC Adoption and Barriers- Individual Decision Making, Andrea Basche, Univ of Nebraska-Lincoln	20:09
12.2 CC Adoption and Barriers- Policy Factors in Decision Making, Andrea Basche, Univ of Nebraska-Lincoln	20:01
12.3 CC Adoption and Barriers- Land Ownership Factors in Decision Making, Andrea Basche, Univ of Nebraska-Lincoln	11:30

Nov 22 ZOOM SESSION 5

- Unit 5 Lab Assignment: Partial budget
- Course concludes

Assignments and Grading

To receive a certificate of completion for the course, you must pass. Your learning will be assessed through lecture quiz grades and lab assignments. Details on these assignments will be posted on the course website.

Quizzes: You must get 100% correct on 70% of the quizzes (unlimited attempts). You are encouraged to complete the quizzes before the corresponding Unit Zoom session, however quiz grades will be accepted until the final day of the course (November 22)

Lab Assignments: You must complete and submit each assignment on Brightspace. You are encouraged to complete a unit's assignment before the corresponding Zoom session, however, late assignments will be accepted up until the final day of the course (November 22). If you have any questions about the assignment, please reach out to Madelyn (celovsk2@msu.edu)

Zoom Sessions: You must attend 3 of 5 Zoom sessions.