

SC341 Soil Ecology

Course Description

Functional roles and management of soil organisms in organic agriculture, with emphasis on ecological interactions with plants and plant pathogens.

Course Format

One-credit course, taught 2 hours per week for a half semester (8 weeks total, during the first half of the spring semester).

Class Objectives

Students will be able to:

- 1) Describe the diversity of organisms living in the soil, including microorganisms and meso-, and macro-fauna, as well as the soil food-web interactions of these organisms;
- 2) Comprehend the roles of soil organisms in soil organic matter formation, nutrient cycling, and control of plant pathogens in organic agricultural systems;
- 3) Manage soil organisms for soil fertility and pathogen control purposes in organic agricultural systems;
- 4) Select appropriate soil biological measurements which may be indicative of soil biological health in organically-managed soils; and
- 5) Make sound management decisions regarding the use of various commercial microbial and humate products available to organic producers.

Course Specifics

Instructor: Dr. Mary Stromberger
Office: C103 Phone: 1-5283
Lab: W204 Phone: 1-6873
Email: Mary.Stromberger@ColoState.edu

Textbook: None required

Other readings: Distributed in class.
Examples would include chapters or articles from:
a) Soil Organic Matter in Sustainable Agriculture. 2004. Fred Magdoff and Ray R. Weil (eds), CRC Press, Boca Raton, FL.
b) Principles and Applications of Soil Microbiology. 2005. David Sylvia et al. (eds.), Pearson Prentice Hall, Upper Saddle River, NJ.
c) American Journal of Alternative Agriculture
d) Renewable Agriculture and Food Systems journal

Prerequisites: SC240

Grading policy:	Exams (2, 100 points each):	200 points
	Homework (10, 10 points each):	100 points
	Class Presentation (1):	100 points
	Total	400 points

Course Outline

<i>Weeks</i>	<i>Topic</i>
1	Review of soil microorganisms, micro-, meso- and macro-fauna; soil food web structure.
2-4	Soil biological roles important to organic food production (soil organic matter formation, nutrient cycling, interactions with and control of plant pathogens, production of plant growth-promoting factors, symbiotic associations with plants, etc.). Exam 1
5	Management of indigenous soil organisms through tillage/no-tillage practices, residue inputs, crop rotations, etc.
6	Microbial inoculants and other commercial soil amendments (e.g., humates).
7	Assessing the biological health of organic soils. Exam 2
8	Class Presentations