

Microbiology for Sustainable Agriculture

SOCR 341

Plant Science W212, MW, 11:00-11:50 am

Spring 2012

1/18/12 – 3/7/12

Course Description and Objectives

Students will be educated in topics of soil microbiology relevant to sustainable agriculture, including the functions of different soil organisms as related to organic food production; how these organisms can be effectively managed, ways to assess the biological health of organic soils, and cautions and concerns regarding commercially available microbial products.

After completion of the course, 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) Understand the roles of soil organisms in soil organic matter formation, nutrient cycling, and control of plant pathogens in organic agricultural systems;
- 3) Make management decisions on the use of 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: Posted on RamCT class page or distributed in class.

Prerequisites: none

Grading policy:	Homework (2; worth 10 and 40 points):	50 points
	Group Presentation:	50 points
	Final Exam	100 points
	Total	200 points

2012 Lecture Outline and Tentative Schedule

<u>Week</u>	<u>Monday</u>	<u>Wednesday</u>
1	<i>MLK day – no class</i>	Intro; Soil organisms
2	Soil food web (Homework #1 due)	Decomposition and SOM
3	Nutrient cycling (N)	Nutrient cycling (P) (Homework #2 due)
4	Plant-microbial interactions	Group Presentations (Plant-microbial interactions)
5	Biological and cultural control of plant pathogens	<i>Colorado Ag Big and Small Conference</i> <i>– no class</i>
6	Group Presentations (Pathogen control)	Management and optimization of microbial processes
7	Management and optimization of microbial processes	Microbial inoculants
8	Group Presentations (Microbial inoculants)	Assessing soil quality with discussion (take home Final Exam due Friday)