

## **SC342      Organic Soil Fertility**

This 1-credit course will be taught in the second half of spring semester in odd-numbered years.

Pre-requisites: SC240, SC350, and SC341

### Catalog Description:

This course will develop an understanding of organic soil fertility management in the larger framework of a holistic organic farming system.

### Instructor:

Dr. Ron Godin, Western Colorado Research Center  
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Dr. Jessica Davis will assist in the coordination and offering of this course.

### Course Goals

1. Develop an appreciation of organic soil fertility management in holistic organic farming systems.
2. Develop an understanding of an organic soil fertility system and its role in the sustainability of soil and agriculture.

### Learning Objectives

Students will:

1. Learn to use holistic management as a tool in organic soil fertility and crop production systems.
2. Develop an understanding of the role of organic matter in organic crop production.
3. Learn the benefits of organic matter on soil quality and sustainability.
4. Learn and understand the importance of irrigation water quality on organic production.
5. Learn organic matter management in an organic production system to achieve crop quality and soil sustainability
  - a. Manure, compost & compost tea
  - b. Cover crops & green manures
  - c. Crop rotations
  - d. Tillage

### Textbooks:

Sustainable Soils, 2003. Wolf, B., & G. Snyder. Food Products Press.

Building Soils for Better Crops. 2<sup>nd</sup> ed. Magdoff, F. & van Es, H. 2000. Sustainable Ag Network. (can be downloaded free from the internet).

Managing Cover Crops Profitably. Sustainable Ag Network. (can be downloaded free from the internet).

### Evaluation:

In addition to a mid-term and final exam, students will work in groups of three to design soil fertility management in a closed or open organic farming system. Students will also be required to write an essay (3-4 pages) describing soil fertility in organic systems.

Mid-term Exam	100
Group Project	100
Essay	100
Final Exam	<u>200</u>
Total	500

### Course Outline

- Week 1 Holistic Management: Whole-farm thinking and the role of organic matter.
- Week 2 Organic matter management and the soil: feeding the soil to feed the plants
- a. Organic matter and soil life
    - i. Soil organisms and their function
    - ii. Processes vital to soil health
    - iii. Controlling pests with soil organisms and organic matter
  - b. Effects of organic matter and tillage on the physical characteristics of the soil
    - i. Soil structure
    - ii. Compaction & infiltration
    - iii. Moisture-holding capacity
    - iv. Erosion
- Week 3 Nutrient management in an organic system
- a. OM decomposition
  - b. SOM & humus
  - c. Nutrient release from OM & SOM
  - d. Effects of OM on nutrient availability
- Week 4 Organic fertilizers and certification requirements
- Week 5 Managing nutrients in high pH soils with high pH irrigation water
- Week 6 Foliar feeding
- Week 7 Soil quality and productivity evaluation
- Week 8 Putting it all together: a sustainable organic soil management system