

SYLLABUS: SOIL 515. SOIL FERTILITY MANAGEMENT

3 credit hours

This is an abbreviated version, consult instructor for full syllabus

Last update: Aug 25, 2014

Instructor

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Course Description in OSU online catalog: Management of plant nutrients in agronomic systems; diagnosis of nutrient availability and prediction of crop response to fertilizers; interactions between nutrient response and chemical, physical and biological properties of soils.

Target Audience

This course is designed for students who have an interest in soil fertility management for crop production in agricultural systems. Challenges/conflicts/compromises between agricultural production goals and environmental quality will be discussed, but are not the major focus of the course. Course is not focused on nutrient management issues of importance in “natural” systems like rangeland or forests.

Enforced Prerequisite Coursework: None. Helpful background coursework: Undergraduate soil fertility/chemistry/biology, statistics, and plant sciences.

General Course Learning Objectives:

Given quantitative data on a fertility problem and the desired outcome, students will diagnose soil fertility problems and create prescriptive recommendations.

Students will review contemporary soil fertility literature, analyze approaches, and explain the advantages and limitations of alternate approaches to diagnosis and correction of soil fertility problems.

Weekly Homework/Problem Sets

Students will receive a case-study each week, with an accompanying problem set. In presenting the solution to the problem set, students are expected to fully explain their reasoning and show calculations in a professional manner. Students have a full week, including a weekend, to work on each problem set.

Final Project presentation

The last two weeks of the term each student will make an oral presentation of 15 to 20 minutes, using appropriate technology. You will present, analyze, and explain soil fertility concepts and data. These presentations are an opportunity for you to explore topics of interest and to educate others in specialty areas within soil fertility management. These presentations will take the form of a “defense” to peers. The objective of the presentation is to convince peers that the approach employed and the conclusions reached are reasonable and defensible. Hardcopy handouts will be provided to your fellow students.

Final exam

A take-home final exam will be provided to students during the final class meeting in Week 10. The final exam must be returned no later than 3:00 pm on Thursday of finals week, in printed form.

Evaluation

Evaluation of student performance will be based on weekly problem assignments: 50%; Final project presentation: 25%; Final exam 25%.

Lecture and Reading Schedule (Updated Feb 4, 2014)

Week	Lecture Topic	<i>Soil Fertility & Fertilizers</i> Book Chapter
1	Introduction: the soil fertility challenge	Chap 1
1	Fertilizer and nutrient management guides	OSU EC 1478-E; PNW 570-E
2	Nutrient "buffering" in soil: quantity and intensity	Chap 2
2	Fertilizer materials: inorganic and organic	OSU Guides
	MLK Holiday	
3	Soil pH effects on nutrient supply and plant nutrition	Chap 3; OSU Guides
4	Liming	Chap 3; OSU Guides
4	Mobile and immobile nutrients in soil and in plants	Chap 2; Plant deficiency diagnosis keys
5	Sulfur cycle and soil acidification with S	Chap 7
5	Sulfur, calcium, magnesium fertilizers & management	Chap 7
6	Potassium	Chap 6
6	N cycling and loss pathways	Chap 4
7	Nitrogen management	Chap 4
7	Nitrogen management	Chap 4
8	Phosphorus cycling	Chap 5
8	Phosphorus management	Chap 5
9	Micronutrients	Chap 8
9	Student oral presentations	
10	Student oral presentations	
10	Student oral presentations	