

SO242
Fertility Management
3 Credits

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Created: 01/01/1992

Revised: 05/06/2017

Approval: 16/06/2017

The Implementation Date for this Outline is 01/09/2017

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SO242 Version: 20



Fertility Management

Calendar Description

This course studies the nutrient requirements mainly for field crop production. The type of nutrients required by plants, sources of these nutrients, and methods of application are considered. Emphasis is given to understanding the chemical and physical properties of fertilizers commonly used, availability of nutrients to plants, and the potential for loss of applied nutrients from the soil. Soil testing and economics of nutrient application are considered.

Rationale

This is a required course for students enrolled in the Crop Technology program. An understanding of soil nutrients, how they move in the soil, how plants utilize them, and their relationship to soil productivity is essential to successful crop production. Commercial fertilizers are a major crop input expense and therefore a thorough understanding of fertilizers is essential. Knowledge of proper soil sampling techniques, how to interpret soil test results, proper fertilizer application methods, and calculation of least-cost sources of nutrients are all very important issues in the most economical use of fertilizer, and for estimating crop profit margins.

Prerequisites

[SO102](#)

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. implement proper soil sampling techniques
2. interpret soil test reports
3. describe plant growth requirements and relate soil fertility to crop productivity
4. describe the use of commonly used fertilizers and their sources
5. calculate fertilizer rates and blends

6. choose the most beneficial fertilizer application method and time of application
7. describe chemical changes that occur when specific fertilizers are applied
8. describe potential losses of nutrients that may occur and explain the environmental concerns
9. discuss the safety concerns with some fertilizers

Resource Materials

Required Text:

None

Reference Texts:

Brady, N. C., & Weil, R. R. (2010). *The nature and properties of soils* (13th ed.). Upper Saddle River, N.J.: Prentice Hall.

Brady, N. C., & Weil, R. R. (2010). *Elements of the properties of soils* (3rd ed.). Upper Saddle River, N.J.: Prentice Hall. Call number S 591 B79 2010.

Eash, N.S. 2015. *Soil Science Simplified*. Hoboken, New Jersey: Wiley-Blackwell. eBook Collection (EBSCOhost).

<http://ezproxy.avc.talonline.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1078122&site=eds-live>

Havlin, J. L., Tisdale, S. L., Nelson, W. L., & Beaton, J. D. (2014). *Soil fertility and fertilizers* (8th ed.). New Jersey: Pearson Inc. Call Number S 633 T61 2014.

Conduct of Course

The course consists of approximately 42 hours of lecture and 14 hours of lab work, films or lab-related study. Classroom instruction is delivered in a lecture style where the instructor discusses pertinent topics and students normally take notes. Questions and discussions are expected and encouraged during lectures as this is the best time to make sure the material is understood. Students are asked questions during lectures to relate topics to previous material, and ensure the class understands the topic being studied. Lecture content will be supported by required readings and assignments. The assigned readings are an integral component of the course and help students apply principles from the lectures and labs. Quizzes on lectures, labs and required readings are provided to help students focus on the main ideas being covered.

The two term exams and the final exam reflect content from the lectures, lab exercises and required readings and assignments. The term exams focus on course content covered prior to these exams and the final exam covers course content from the beginning of the course.

Basic course information will be available on D2L. However, the provided notes are not a substitute for attending lectures. There will be additional testable material covered in the lectures and labs that is not in the provided notes.

Evaluation Procedures

Exam 1	15%
Exam 2	15%
Comprehensive Final Exam	25%
Assignments and Quizzes	25%
Lab Assignments	20%
Total	100%

Grade Equivalents and Course Pass Requirements

A minimum grade of D (50%) (1.00) is required to pass this course.

Letter	F	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Percent Range	0-49	50-52	53-56	57-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00	4.00

Students must maintain a cumulative grade of C (GPA - Grade Point Average of 2.00) in order to qualify to graduate.

Attendance

Classroom and laboratory attendance is considered vital to the learning process and as significant to the students' evaluation as examinations and reports.

- a. Students having a combination of excused and/or unexcused absence of 20 percent or higher for the scheduled course hours will be required to withdraw and will automatically receive a "RW" (required withdrawal) for the course, regardless of any other evaluation results. (RW is a failing grade.)
- b. An excused absence is one that is verified with your Instructor. Verification should be prior to the absence or the next class day following the absence. Verification of the absence may take the form of a note from your doctor/College nurse regarding illness, or a note from another Instructor regarding a field trip or other activity, or authorization by

your Instructor. An unexcused absence is anything NOT verified by the instructor prior to the absence or the next class day following the absence.

NOTE: Any exceptions to the above attendance policy (e.g. timetable conflicts, work-related issues) must be approved in writing by the Department Chair prior to the beginning of the course.

It is the students' responsibility to know their own absentee record.

Normal hours are 8:30 a.m. to 6:30 p.m., with potential for evening courses, exams or extended field trips. Students are expected to be available for classes during these times.

Course Units/Topics

Order of delivery of topics may vary.

1. Plant Growth Requirements
 - fertility
 - productivity
2. Cropping Objectives
 - maximum yield
 - highest quality
3. Plant deficiency symptoms for essential nutrients
4. Overview of commonly used fertilizers
 - organic products
 - manufactured synthetic fertilizers
5. Fertilizer Economics
 - cost per unit of actual nutrient
 - economic application rates based on marginal analysis
6. Transformation and movement of nutrients in the soil
7. Soil testing
8. Nitrogen Fertilizers
 - available products
 - application methods
 - safety concerns
 - environmental concerns

9. Phosphorous Fertilizers
 - available products
 - application methods
 - availability concerns in the soil
 - environmental concerns

10. Potash Fertilizers
 - available products
 - application methods



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