Sustainable Nutrient Management

Soil Science 109 Spring Term

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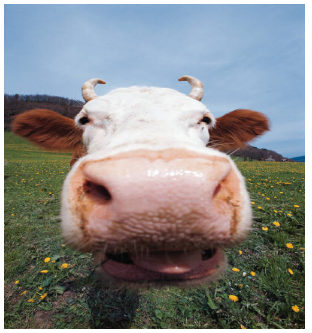

The goal of this course is to attain a comprehensive understanding of plant nutrition, soil fertility, and nutrient management to (1) describe the influence of soil chemical, biological, and physical properties and processes on nutrient availability to plants; (2) identify plant nutrition and soil fertility problems and recommend proper corrective action; (3) identify soil and nutrient management practices that maximize agricultural and ecosystem productivity while maintaining or enhancing soil and environmental quality; 4) conduct and interpret soil fertility assays; and 5) develop comprehensive nutrient management plans for organic and conventional systems.

Class Outline

- Historical aspects of nutrient management from Neolithic agriculture to present
- Factors affecting net primary production of ecosystems
- Essential elements in plant nutrition, nutrient deficiency symptoms, yield limiting factors
- Nitrogen, phosphorus, potassium, sulfur, calcium, magnesium and micronutrients
- Alternative fertilizer such as wastes (biosolids, food processing, etc.), animal manures, composts
- Soil-plant-microbe relationships including nitrogen fixation and mycorrhizal relationships
- Soil management, pH and salinity/sodicity
- Fertilizers and water use, soil fertility evaluation
- Organic Agriculture
- Sustainable agriculture, orchards, viticulture
- Grassland and forest nutrient management
- Comprehensive nutrient management plans

Laboratory

- Field soil sampling techniques
- Field trips to forest, range and agricultural land
- Plant fertility trials of organic and conventional agriculture
- Microbial biomass assays and nitrogen availability indices
- Soil nutrient analysis
- Soil test interpretation and land use plans