NSAC Graduate Module Outline

Title: Nitrogen/Phosphorus Assimilation-Metabolism in Plants

Instructor: Dr. Hong Li (*Department of Plant and Animal Sciences*)
Timing: Winter 2011

Module Description:
This graduate module will introduce the knowledge of principles and mechanisms of N/P nutrient assimilation- metabolism in plants. This module is focused on relationships of plant nitrogen metabolism and plant photosynthesis, N/P assimilation-metabolism pathway, factors influencing N/P uptake, transport of N/P within plants, and nitrate/nitrite reductase and phosphatase activities at different plant growth stages.

1. Nitrogen assimilation-metabolism in plants
   - 1.1 Chemistry of nitrogen (N cycling within plant-soil)
   - 1.2 Nitrogen oxidation & reduction reactions
   - 1.3 Principle of N uptake
   - 1.4 Nitrogen transport within plants: from sources to sinks
   - 1.5 Nitrogen metabolism and plant photosynthesis
   - 1.6 Nitrate/nitrite reductase activity

2. Phosphorus assimilation-metabolism in plants
   - 2.1 Chemistry of phosphorus (P cycling within plant-soil)
   - 2.2. Relationships of P/N in plants
   - 2.3 Phosphorus adsorption and its influencing factors
   - 2.4 Acid phosphatase activity
   - 2.5 Tracking in-season P transport within plants using isotopic ^{32}P

Format:
This module will consist of 8 hours of lecture and discussion (2 hours/week, 4 weeks). Each student will complete 1 assignment and give 1 oral presentation.

Method of Evaluation:
The final grade will be based on assignments (60%) and oral presentation (40%).

Prerequisites:
Admission into the graduate program.
An undergraduate course in plant science, soil science or environmental science.