

PLHL 7082
SOILBORNE PLANT PATHOGENS

Course description: Physiology, ecology, and pathology of soilborne plant pathogens; control strategies including cultural, biological, and genetic; disease suppressive soils.

Objectives: General objectives of the course include the following:

1. Become familiar with specific components of the soil environment that affect soilborne plant pathogens, roots and the infection process;
2. Examine biological interactions between pathogens and other microbes in the soil;
3. Apply ecological principles to explain population dynamics and interactions.

Text book: None. There is no suitable text book in this subject matter.

Instructor: Raymond W. Schneider
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Office hours: By appointment

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| <u>Evaluation:</u> | Final exam | 20% |
| | Presentation | 70% |
| | Participation | 10% |

Oral presentation:

Each student is required to present a lecture and lead a discussion on a specific topic. Topics are to be approved by the instructor. The lecture should focus on current literature, examine controversial issues, and suggest a research program designed to resolve controversies or overcome impediments to progress. The lecture/discussion should present information on a selected pathogen or disease at a level consistent with a graduate level course. The discussion leader will distribute to the class at least one week in advance two or three research papers on the selected topic. During the discussion period, the leader will critique the papers with regard to objectives and methods and determine if the conclusions are sound and the objectives have been met.

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Topics to be addressed in class:

Introduction, course overview and principles of ecology;

The physical/chemical environment of soil: Plant and soil water relations, soil atmosphere, pH, and salinity;

Nutrient cycles and plant nutrition: Form of nitrogen, nitrification and denitrification;

The rhizosphere: Definition, significance, root exudates, nutrient interactions, root infection;

Minor pathogens and feeder root declines;

Pathogen interactions;

Disease suppressive soils: Examples, mechanisms and applications;

Biological control: Antagonists, cross protection and competitive infection, and rhizosphere competence;

Fungistasis