STATISTICS SEMINAR

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Master's Defense

Thursday July 28, 2016

Dickens Hall, Room 207, 3:00-5:00 pm

On Sampling Procedures for Detection of *Heterodera Glycines*, the Soybean Cyst Nematode, and Other Soil Dwelling Organisms

Heterodera glycines, or the soybean cyst nematode (SCN), is a parasite that targets and damages the roots of soybean plants. It is the most yield-limiting pathogen of soybean in the U.S. and the reliable detection and accurate estimation of population densities is crucial to research and management of this pathogen. A study was performed to understand the effects of crop rotation on the prevalence of SCN. Standard sampling procedures in the plant pathology community dictate taking soil samples from potentially infected fields, processing them and counting the number of eggs in one 1 mL subsample via microscope. Suspecting the traditional procedure may lead to invalid results, false negatives in particular, the researcher created and implemented a sampling procedure based on his knowledge of sampling methods and constraints of sampling in the field. Using the data collected, we will discuss the strengths and limitations of the procedure in estimating the population density of SCN in the field. In addition, a simulation study informed by the data will be conducted to determine a sampling strategy that will yield accurate results while still considering the conditions in the field. Knowledge on how the different stages of the sampling procedure for SCN affect the accurate detection of the pathogen would extend to experimental designs and sampling methodologies for other soil dwelling organisms.