Classifier Development of Near Infrared Spectroscopy Derived Data to Determine Soybean Cyst Nematode Resistance. (C01-sleper094316-Poster)

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Abstract:

Current methods for selecting soybean cyst nematode (Heterodera glycines Ichinohe) (SCN) resistant genotypes are labor and resource intensive. Near infrared spectroscopy (NIR) was initially used to determine resistance to SCN in our lab. Because of the complexity of spectrum data, appropriate dimension reduction and multi-collinearity must be addressed to make stable predictions. Objective of this study was to use machine-learning techniques to classify SCN resistant and susceptible soybean genotypes. Various supervised learning approaches (forward selection, principal component regression and neural networks) were estimated based on the data collected from NIR analysis with bioassay results providing class labels for the resistant and susceptible genotypes. Our preliminary results indicted that forward selection had better prediction, evidenced by the cross-validation. The advantages and disadvantages of these methods will be discussed. Heterogeneous samples will be used to test the validity of the classifiers.

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