

Project Abstract

Project Title:	Improving the stability of forecasting models for Fusarium head blight	
USWBSI Project ID:	FY24-MG-002	
Principal Investigator:	Erick DeWolf	Kansas State University

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Project Summary

The overall goal of this project is to create stable models for predicting Fusarium head blight (FHB). A failure to understand the stability of a model prior to deployment as part of an operational disease forecasting system can lead to poor performance and incorrect management decisions by stakeholders. Our objectives are to 1) Continue expanding the FHB data matrix with observations from the IM-CP, but also estimate how many observations are needed for model stability; 2) Search for a stable FHB predictive model or ensemble of models that generalizes well to any environment (in the future or in other states); 3) Formally assess the stability of variable selection in logistic regression (LR) and random forest (RF) models proposed for FHB prediction; 4) Assess the predictive stability of LR and RF models developed to date. This project directly addresses research priorities *Utilizing data generated from integrated management experiments to maintain, improve, and refine current FHB forecasting models*"; and 2) *Enhance and validate forecasting capabilities for FHB in small grains...*. Continued collaboration with the Integrated Management Coordinated Project (IM-CP) will further expand the data matrix to include a diverse set of environments and help adapt the models to a changing climate. The addition of new observations is essential as we expand the forecasting system to include additional states. Evaluating and understanding stability, both in the features selected as predictors and in the predictions returned by a fitted model, will help us provide consistent and reliable forecasting systems for FHB in the U.S. We expect this project will result in more reliable models and ensembles of models that can be deployed via the Fusarium Head Blight Prediction Center. Growers, crop consultants, farm managers and other stakeholders will have more accurate and consistent forecasts of FHB epidemics to better inform them on FHB management decisions.