

Olanya, M.; Honeycutt, C.; Larkin, R.P.; and He, Z. 2010. Assessment of SIMBLIGHT1 and SIMPHYT1 models for prediction of *Phytophthora infestans* outbreak in North-Eastern U.S. from 2004 to 2009 seasons. *Phytopathology* 100:S92.

Accurate prediction of *Phytophthora infestans* outbreak during a cropping season is crucial for effective management of late blight. The SIMBLIGHT1, SIMPHYT1, and modified SIMPHYT1 models were assessed for prediction of late blight outbreak relative to the NOBLIGHT model based on climatic data from field experiments. The dynamics of late blight infection pressures and *Phytophthora* efficiency (pew-values) were computed by the SIMPHYT3 model to assess conduciveness of climatic conditions for disease development. Simulation results (recommended fungicide treatment) of SIMPHYT1 model predicted first application dates of July 11, 21, 8, 10, 7 and 7 for 2004 to 2009, and for the modified SIMPHYT1 model (US-version) on July 11, 22, 8, 19, 7, and 7 for the same years. Comparison of simulation results with date of disease outbreak in untreated plots resulted in differences of 24–65 days. Validation of the models (differences between recommended fungicide treatment and first blight outbreak) gave better fit for models with predicted intervals of 6–20 days from initial fungicide application to first late blight outbreak. The SIMBLIGHT1, SIMPHYT1, and NOBLIGHT models were accurate and flexible in forecasting the timing of first fungicide applications for disease control. Due to the conducive conditions for late blight potential and infection pressures, development of predictive models that can account for external inoculum sources will greatly improve late blight management at regional or national scales.