Development of prediction models for bacterial leaf blight Xanthomonas axonopodis pv. malvacearum of cotton (Gossipium hirsutum) in Andhra Pradesh and Maharashtra.

Abstract:

Historical data on bacterial leaf blight disease incidence was analyzed vis-à-vis corresponding weather for identification of conducive weather conditions for disease development at three important cotton-growing locations situated in Andhra Pradesh and Maharashtra. Bacterial leaf blight incidence showed significant negative correlation with minimum temperature at all the three locations. Significant positive correlation was observed with rainfall and number of rainy days at Guntur. Multiple regression analysis between disease incidence (initiation to peak data) and weather variables yielded location-specific models for disease prediction one week in advance. Co-efficient of determination was lowest (57%) when input weather variables were simple weekly averages and improved when moving averages were introduced (61%) and was highest (92%) when preceding disease incidence level was included in the model for Guntur. However, simple weekly averages of significant weather variables along with previous week's disease level resulted in equations that explained 78% and 70% variation in disease incidence for Parbhani and Akola, respectively. Validation of the equations with independent data sets led to the identification of the best-fit model for each location based on chi-square test for goodness of fit. The utility of location-specific models is discussed.

Keywords:

Weather, conditions, disease, development.