Weather based forecast models for diseases in mustard crop

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ABSTRACT. Forewarning systems can provide advance information for outbreak of pests / diseases attack. Most of the earlier workers have utilised regression models (both linear and non-linear) for pests / diseases forewarning. Artificial Neural Network (ANNs) techniques are in vogue due to their wide range of applicability and the ease with which they can treat complicated problems even if the data are imprecise and noisy. This methodology has been explored for forewarning Alternaria Blight and Powdery mildew in mustard for maximum disease severity, crop age at first appearance of disease and crop age at maximum disease severity as response variables and weather indices as predictors for three locations namely Bharatpur, Dholi and Berhampur. In this study, two types of neural network architectures namely Multilayer perceptron (MLP) and Radial basis function (RBF) were attempted and compared with weather indices based regression model and it has been found that a MLP performs best in terms of mean absolute percentage error (MAPE).

Key words – Forecasting models, Alternaria blight, Powdery mildew, Artificial neural network, Multilayer perceptron, Radial basis function and weather indices.