**Abstract**

Cotton, popularly known as "White Gold" has been an important commercial crop of national significance due to the immense influence of its rural economy. Cotton seed is an important and critical link in the chain of agricultural activities extending farmer industry linkage. Cotton yield is associated with high quality seed as the seed contains in itself the blue print for the agrarian prosperity in incipient form. Transfer of technology to identify the quality of seeds is gaining importance. Hence this work employs machine learning approach to classify the quality of seeds based on the different growth stages of the cotton crop. Machine learning techniques - Naïve Bayes Classifier, Decision Tree Classifier and Multilayer Perceptron were applied for training the model. Features are extracted from a set of 900 records of different categories to facilitate training and implementation. The performance of the model was evaluated using 10 -fold cross validation. The results obtained show that Decision Tree Classifier and Multilayer Perceptron provides the same accuracy in classifying the seed cotton yield. The time taken to build the model is higher in Multilayer Perceptron as compared to the Decision Tree Classifier.