The fused dataset of Bi-temporal optical and UAVSAR radar readings is crucial for classifying crop types over an agricultural region. These factors are used to obtain crop maps with great accuracy. This research analyzes the time complexity, accuracy, precision, recall, F1 score and confusion matrices for various machine learning models. These models are Random Forests, Support Vector Machines, Linear Regression, Decision Trees, Logistic Regression and Stochastic Gradient Descent. Each conducted experiment is on data with temporal and radar readings. A classification report is analyzed for each model. Metrics such as precision, recall, F1 score, and support count are obtained from the report to determine the strengths and weaknesses of each model. The results demonstrate that the random forests model outperforms the other models.