Estimation of specific crop and acreage plays a vital role in the field of crop planning, monitoring, crop condition, yield forecasting and acreage estimation. There have been several studies conducted to classify the crops at continental to the regional level, but still, work is needed to map small area covered by different crops using Remote Sensing technology. The main objective of the present study is to explore whether the Fuzzy classifier can improve the accuracy of crop classification as compared to other traditional Classifiers, such as Maximum likelihood, Mahalanobis etc. The attempt has been done to classify different crops at a smaller scale. The Landsat time series 8 band OLI data was used to investigate multiple crop phenomena. Two scenes were acquired in Kharif seasons (September 28 and October 30, 2014). Three indices such as NDVI, SAVI, and RVI, were used to know vegetation condition. The Spectral signatures generated from data for the residues of Sugarcane and Maize based on prior knowledge of the field work. Four techniques based on Maximum Likelihood, Mahalanobis Classifier, Knowledge classifier and fuzzy classification techniques were used to
extract the crops information based on the signatures. The resulting overall classification accuracy was calculated using stratified random sampling method. The corresponding performance efficiency of these four methods was found to be 84%, 85%, 87% and 90.67%, respectively, indicating the fuzzy method to be the most efficient as compared with other classification techniques.

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**Index Terms**

Computer Science Fuzzy Systems

**Keywords**

Crop Classification, Fuzzy Classifier, Knowledge Classifier, Landsat Data, NDVI.