

# **SUGARCANE DISEASE DETECTION USING MACHINE LEARNING METHODS**

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## **ABSTRACT:**

Agriculture is one of the oldest occupations in the world and continues to exist today. In some form or another, the world's population depends on agriculture for its needs. The major loss in sugarcane production in India is due to pests, plant disease, malnutrition, and nutrient deficiency in plants. Accurate Identification of these diseases and providing the proper treatment at the right time is utmost needed. This can only be done by applying machine learning-based Internet of Things solutions in real time. Initially to address the issue many have used SVM, RF (random forest), Clustering concepts but they failed because these are giving limited generalization and can't handle high Dimensional data as Sugarcane disease detection often involves analyzing high-dimensional data, such as multispectral or hyperspectral imagery. Hence applying intelligent solutions that use Image processing and soft computing that involves CNN and fine tuning with EfficientNet to classify the category of diseases accurately. Four sugarcane diseases are investigated, such as Mosaic, Redrot, Yellow Leaf, and Rust, and analyzing three characteristics such as Color, Shape, and Texture that contributes to the accurate detection of the disease. The available dataset is having various images of the diseased sugarcane crops and we analyze and preprocess (resizing, remove unwanted noise caused by sunlight glare) the images before splitting them into Training and Testing sets. Finally the performance of the model is measured by the Confusion Matrix i.e how well the model can classify the categories and depicts the Training and Validation Loss to measure the accuracy.

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