

Abstract

Maize crop protection is crucial for global food security, requiring accurate disease identification. In Kenya, farmers rely on subjective visual analysis of symptomatic leaves, which is time-consuming and prone to errors. Computer vision technologies, like deep learning and machine learning, offer promising solutions for disease identification. This study applies Convolutional Neural Networks (CNNs), specifically AlexNet and ResNet-50, to automatically learn image features and enhance speed and accuracy in maize leaf disease identification. A dataset of 3200 digital maize leaf disease images from Embu County is used for training and testing. AlexNet achieved the highest average accuracy of 98.3%, followed by ResNet-50 at 96.6%. The machine learning, support vector machine (SVM) exhibited the lowest average accuracy of 85.5%. These findings highlight the significance of utilizing AlexNet and ResNet-50 in maize leaf disease identification and classification.