

Mini Review

Machine Learning Approach for Detection of Soybean Diseases

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Abstract

Soybean stand out as the most cultivated crop in India. Farming encounters obstacles caused by plant diseases in agriculture operations. Soybean plants frequently develop infections caused by bacteria, fungi, and viruses during the cultivation period which can harm yield and productivity. Early disease detection is crucial for maintaining production levels and losses. Efficient identification of symptoms associated with soybean plant diseases plays a role in the early detection of diseases during the growing season to avoid significant crop losses. Detecting diseases accurately and automatically can facilitate the implementation of strategies to minimize yield losses. A helpful approach, for farmers is to utilize an automated system that processes images of leaves that seem to be infected. The article explores the advantages of utilizing machine learning (ML) strategies. This review covers steps in the identification and detection of soybean plant disease with the help of an image dataset using different algorithms. It highlights the importance of feature extraction, selection, and classification methods. The study systematically examines different machine-learning algorithms that are used in the diagnosis of diseases in soybeans. Among the techniques are k-means clustering, multilayer perceptrons (MLP), decision trees, random forests, artificial neural networks (ANN), convolutional neural networks (CNN), support vector machines (SVM), and random forests. It examines each algorithms benefits, shortcomings, and appropriateness for soybean disease detection.

Key words: Algorithms, disease detection, machine learning, soybean

Citation: Sawant DN, Bansode GD, Yadav SV, Limaye VA, Agalave MC and Thakur VA. 2025. Machine learning approach for detection of soybean diseases. *J Mycol Pl Pathol* 55 (2): 121-133 (<https://doi.org/10.59467/JMPP.2025.55.121>)