

Enhancing Precision Agriculture through Object Detection Algorithms: A Study of YOLOv5 and YOLOv8 in Detecting Armillaria spp.

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Abstract : Over the past few decades, the rapid growth of the global population has led to the need to increase agricultural production and improve the quality of agricultural goods. There is a growing focus on environmentally eco-friendly solutions, sustainable production, and biologically minimally fertilized products in contemporary society. Precision agriculture has the potential to incorporate a wide range of innovative solutions with the development of machine learning algorithms. YOLOv5 and YOLOv8 are two of the most advanced object detection algorithms capable of accurately recognizing objects in real time. Detecting tree diseases is crucial for improving the food production rate and ensuring sustainability. This research aims to evaluate the efficacy of YOLOv5 and YOLOv8 in detecting the symptoms of Armillaria spp. in sweet cherry trees and determining their health status, with the goal of enhancing the robustness of precision agriculture. Additionally, this study will explore Computer Vision (CV) techniques with machine learning algorithms to improve the detection process's efficiency.

Keywords : Armillaria spp., machine learning, precision agriculture, smart farming, sweet cherries trees, YOLOv5, YOLOv8

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