

Tech-Driven Strategies for Paddy Disease Prevention and Crop Health Optimization

Mr. Raj Kumar Sharma, Mr. Sahib Sethi, Mr. Srikant Singh*

School of Engineering, P P Savani University, Dhamdod, Gujarat

*Corresponding Author

Abstract: *This paper explores how modern technologies are reshaping the diagnosis and management of diseases in paddy cultivation. It outlines the transition from traditional practices—such as manual inspection and visual symptom recognition—to advanced, technology-enabled solutions. Key innovations discussed include machine learning algorithms, remote sensing techniques, and biosensors, all of which contribute to more accurate and timely disease detection. The study highlights tools such as AI-driven image analysis, spectral data interpretation, and wearable sensor systems that offer promising results in real-time monitoring and early intervention. Real-world case studies are presented to demonstrate the effectiveness of these tools in improving crop health and reducing yield loss. In addition to showcasing technological advancements, the paper addresses existing challenges, including the complexity of data analysis, limitations in scalability, and the importance of collaboration among agricultural stakeholders. The research underscores the potential of integrating digital tools with agricultural practices to build more resilient, efficient, and sustainable paddy farming systems.*

Keywords: Paddy Disease Management, Precision Agriculture, Machine Learning, Remote Sensing, AI-Based Disease Detection, Spectral Imaging, Biosensors, Early Disease Detection, Crop Health, Smart Farming, Digital Agriculture, Sustainable Farming, Agricultural Innovation, Interdisciplinary Collaboration, Technology Integration.

