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(57) Abstract :

The proposed invention is an AI-driven crop disease prediction and prevention system that integrates multi-spectral imaging and big data analytics to monitor and manage plant health in real-time. Using multi-spectral sensors mounted on drones or satellites, the system captures detailed images of crops across various wavelengths, detecting early signs of disease and plant stress before visible symptoms appear. Artificial intelligence algorithms process the imaging data alongside environmental factors, such as soil moisture, temperature, and weather, to generate accurate disease forecasts. The system continuously learns from new data, improving its predictive capabilities and adapting to different crop types and conditions. Through a user-friendly interface, farmers receive timely risk assessments, recommendations for disease prevention, and targeted treatment schedules, while automated systems can be employed to apply interventions. By minimizing pesticide use and optimizing resource allocation, the system promotes sustainable farming practices, improving crop yield and resilience while reducing environmental impact.

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