AI and Horticulture: Innovations in Crop Monitoring, Resource Management, and Yield Optimization

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Abstract

Artificial Intelligence (AI) is revolutionizing horticulture by enhancing productivity, sustainability, and efficiency. AI-powered systems enable precision agriculture through the analysis of data from sensors, drones, and satellites, optimizing planting, irrigation, and harvesting practices. Advanced image recognition tools facilitate early detection of pests and diseases, reducing crop losses and minimizing pesticide use. Automated farming systems, including robotic harvesters and weeding robots, perform labor-intensive tasks with precision, reducing costs and improving efficiency. AI-driven climate monitoring and smart irrigation systems optimize resource utilization, conserving water and protecting crops from environmental stresses. Yield prediction models and supply chain optimization tools improve market forecasting and reduce post-harvest waste. Additionally, AI accelerates genetic improvement in crops by identifying traits for resilience and productivity. By enabling resource conservation and sustainable practices, AI addresses challenges in food security and environmental impact, offering transformative potential for the horticulture industry.

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