

Machine Learning for Water Resource Optimization in Smart Agriculture and Sustainable Potato Farming

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Abstract:

Efficient water resource management is vital for enhancing crop productivity and promoting sustainability in smart agriculture. This study presents a machine learning-based framework for optimizing water usage in potato farming, integrating real-time IoT sensor data with predictive modeling techniques. Key environmental parameters such as soil moisture, temperature, humidity, and crop growth stages are monitored and analyzed using machine learning algorithms including Decision Trees, Support Vector Machines (SVM), and Artificial Neural Networks (ANN). These models predict irrigation requirements and optimize watering schedules to minimize water waste while maximizing crop yield. The system supports adaptive decision-making in precision farming, improving resource efficiency and contributing to environmentally sustainable practices. The proposed framework demonstrates high accuracy in forecasting irrigation needs and offers a scalable solution for sustainable water management in potato agriculture.

Keywords:

Water optimization, machine learning, smart agriculture, potato farming, sustainability, precision irrigation.

REQUEST FOR FULL TEXT

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