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INTEGRATION OF SATELLITE, DRONE, AND IN-SITU DATA FOR PRECISION AGRICULTURE
APPLICATIONS

Abstract

Precision agriculture, a modern approach, relies on advanced technologies to optimize crop yields while minimizing inputs such as water, fertilizers and pesticides. This work explores integrating satellite images, drone images, and sensor and in situ data to improve precision agriculture practices. Satellite imagery provides comprehensive area coverage and temporal monitoring, offering information on crop health, moisture levels and soil conditions. Drones offer high-resolution imagery and spatial data, allowing farmers to evaluate crop growth at a finer scale and detect anomalies such as pest infestations or nutrient deficiencies. In situ data, collected directly from sensors deployed in the field, provides real-time information on soil moisture, temperature and other environmental factors. By combining these data sources, farmers can make data-driven decisions to optimize irrigation programs, tailor fertilizer applications, and identify areas for targeted interventions. This research highlights the potential of integrating multiple data streams to enable more accurate and sustainable agricultural practices, ultimately contributing to greater productivity and resource efficiency in agricultural operations.