

Review of: "Integration and Implementation of Multiple Soil Sensors for Automated and Regulated Irrigation"

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Potential competing interests: No potential competing interests to declare.

Summary:

The manuscript describes the development and evaluation of an integrated soil monitoring system capable of real-time data acquisition, wireless transmission, and automated irrigation control. Field testing validated the system's high accuracy and reliability in measuring soil parameters. The collected data informs irrigation, fertilization, and soil management practices, promoting sustainable and efficient agriculture.

Strengths:

Innovation and Relevance: The study tackles key agricultural challenges like water management and soil nutrient monitoring, offering a cost-effective, efficient solution.

Technical Validation: Rigorous testing demonstrated strong correlations with standard measurements (R^2 values of 0.88–0.98), confirming the system's accuracy and reliability.

Practical Application: The system integrates sensors with a user-friendly platform for data collection, analysis, visualization, and interpretation, helping farmers optimize irrigation and fertilization.

Wireless Communication: Real-time wireless data transmission supports timely decision-making, critical for effective agricultural management.

Areas for Improvement:

Energy Consumption: The manuscript omits details about the system's energy consumption, which is crucial for remote or resource-constrained settings. Discussing energy efficiency would strengthen the work.

Comparative Analysis: Detailed descriptions of the standard equipment or methods used for comparison are missing. Including this information would improve the clarity and reliability of the comparative results.

Conclusion:

The manuscript presents a significant advancement in soil monitoring technology with clear benefits for sustainable agriculture. Addressing energy consumption and providing detailed comparative analyses would further enhance the study's robustness and practical applicability.

