

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

Ernane Jose Xavier Costa<sup>1</sup>

<sup>1</sup> Universidade de São Paulo

**Potential competing interests:** No potential competing interests to declare.

## Summary:

The manuscript presents the development and evaluation of an integrated soil monitoring system capable of real-time data acquisition, wireless transmission, and automated irrigation control. The system's performance was validated through field testing, showcasing high accuracy and reliability in measuring various soil parameters. The data collected is utilized to inform irrigation, fertilization, and other soil management practices, promoting sustainable and efficient agricultural practices.

## Strengths:

**Innovation and Relevance:** The study addresses critical challenges in agriculture, such as water management and soil nutrient monitoring, by developing a cost-effective and efficient soil monitoring system.

**Technical Validation:** The system was rigorously tested, demonstrating high coefficients of determination ( $R^2$  values ranging from 0.88 to 0.98) when compared with standard measurements. This validates the system's accuracy and reliability.

**Practical Application:** The integration of sensors with a computer-based user platform enables comprehensive data collection, analysis, visualization, and interpretation. This assists farmers and agronomists in making informed decisions, thereby optimizing irrigation and fertilization practices.

**Wireless Communication:** The capability for wireless data transmission ensures seamless and real-time monitoring, which is crucial for timely decision-making in agriculture.

## Areas for Improvement:

**Energy Consumption:** The manuscript does not provide details on the energy consumption of the developed system. Considering the importance of energy efficiency, especially in remote and resource-limited settings, this aspect should be discussed.

**Comparative Analysis:** The manuscript lacks detailed information on the equipment or methods considered as standard for comparison with the developed system. Including these details would strengthen the validity of the comparative results and provide a clearer benchmark for evaluating the system's performance.

### Conclusion:

Overall, this manuscript presents a significant advancement in soil monitoring technology, with potential benefits for sustainable agriculture. Addressing the noted areas for improvement will further enhance the robustness and applicability of the research.