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REVIEWER'S REPORT

Manuscript No.: IJAR-50629 Date: 14-03-2025

Title: Enhancing Rose Plant Growth with Mutton Washed Water: A Machine Learning Approach

Recommendation:
Accept as it is.....**YES.....**
Accept after minor revision.....
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality	√			
Techn. Quality		√		
Clarity		√		
Significance			√	

Reviewer's Name: Mir Tanveer

Reviewer's Decision about Paper: **Recommended for Publication.**

Comments (*Use additional pages, if required*)
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Reviewer's Comment / Report

This paper presents an **innovative and well-structured** exploration of the effects of **mutton washed water on rose plant growth**, integrating **AI-driven predictive modeling** to optimize application strategies. The research effectively combines **agricultural science, environmental sustainability, and artificial intelligence**, making it a valuable contribution to both **agronomic research and AI applications in agriculture**.

Abstract Analysis

The abstract provides a **clear and concise summary** of the study, outlining its **rationale, methodology, and key findings**. The inclusion of **machine learning models** and their role in predicting the **long-term effects of organic fertilizers** adds a **modern technological perspective** to sustainable agriculture. The potential benefits and risks associated with **mutton washed water** are **well-articulated**, ensuring a balanced discussion of its applicability.

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Introduction & Research Context

The introduction effectively highlights the **growing importance of organic fertilizers** as sustainable alternatives to **synthetic chemicals**. The discussion on **mutton washed water as an underutilized nutrient source** is well-supported by references, positioning the study within the broader framework of **eco-friendly agricultural practices**.

The **integration of AI in agricultural research** is introduced with **relevant citations**, emphasizing how machine learning can enhance **nutrient analysis, soil health assessments, and application strategies**. The **scientific validation approach** ensures that the study is **grounded in data-driven methodologies**, reinforcing its **credibility and practical relevance**.

Theoretical Framework: AI in Agricultural Research

The section on **AI-driven data analysis** effectively details **how machine learning models such as Random Forest Regression (RFR) and Support Vector Machines (SVM)** can be applied to **agricultural datasets**. The discussion on **Convolutional Neural Networks (CNNs) and Reinforcement Learning** broadens the scope by illustrating **AI's potential beyond traditional agronomic methods**. The **use of Natural Language Processing (NLP) models** for **scientific literature analysis** is particularly **noteworthy**, showcasing a **comprehensive AI-assisted research approach**.

The **formalism section on AI-powered soil and fertilizer optimization** is **well-structured**, providing an in-depth **explanation of data analysis techniques**. The inclusion of **Gradient Boosting and Deep Neural Networks** enhances the **technical rigor** of the paper, making it highly relevant for researchers and practitioners in **precision agriculture**.

Empirical Analysis & AI-Driven Insights

The study's methodology demonstrates **scientific rigor**, incorporating **controlled experiments, nutrient profiling, and AI-based predictive modeling** to assess the **efficacy of mutton washed water**. The analysis of **soil microbial diversity, plant growth metrics, and potential nutrient toxicity** ensures a **holistic understanding of the fertilization process**.

By employing **AI-based anomaly detection** and **real-time analytics**, the research provides **practical recommendations** for optimizing **fertilizer composition and application frequency**. This

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interdisciplinary approach, merging agronomy, environmental science, and artificial intelligence, adds to the study's significance and applicability in sustainable farming.

Conclusion

The paper successfully integrates AI-driven analysis with agricultural sustainability, demonstrating the potential of mutton washed water as a natural fertilizer while ensuring scientific validation through machine learning models. The systematic exploration of soil health, plant growth, and AI optimization strategies strengthens the scientific contributions of this research.

Final Remarks

Overall, this study presents a well-articulated, scientifically rigorous, and technologically advanced approach to organic fertilization and AI-driven agriculture. The multidisciplinary perspective makes it relevant to researchers, agronomists, and AI specialists alike, contributing to the advancement of eco-friendly farming practices and precision agriculture.