Tropentag, September 10-12, 2025, hybrid conference

"Reconcile land system changes
with planetary health"

Comparing indigenous and scientific (Palintest) soil fertility assessment approaches for better soil health monitoring, management, and farm decision-making in Uganda

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Abstract

With a need to meet the food demands of the expected 9 billion population by 2050, soil fertility management is a critical component for sustainable agricultural productivity and environmental preservation. However, the disturbing issue is the method of soil fertility assessment. Traditionally, most farmers use vegetation cover, weeds, soil colour, and previous yield indicators for soil fertility assessment. On the other hand, modern scientific soil fertility assessment methods like laboratory soil testing, rapid soil testers, remote sensors, and scanners that emerged from research and innovations are being promoted. This paper, therefore, compared the performance of the indigenous and scientific soil fertility assessment approaches for better soil health monitoring, management, and farm decision-making in Uganda. Using a sample of 461 Agriculture Cluster Development Project farmer beneficiaries in Uganda, the extent of soil fertility misclassification and its correlates were also assessed. From the descriptive statistics, our findings reveal that the indigenous soil fertility of vegetation cover, weeds, soil colour, and previous yield indicators were associated with 71 %, 67 %, 66 %, and 61 % levels of misclassification, respectively. The Probit model results revealed that the plot size and land tenure system had a significant positive association with misclassification. These results suggest that the farmers' likelihood of misclassifying soil fertility using indigenous approaches significantly increased as plot sizes increased. Additionally, farmers who owned land were more likely to misclassify their soil fertility status than those who rented it. This implies that the most reliable soil fertility assessment approach is the objective scientific soil testing for better soil monitoring and health management decisions.

Keywords: Correlates, indigenous, misclassification, Palintest , soil fertility

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