



# Nutrient Retention Performance of Sustainable Soil Fertility Management Strategies for Smallholder Farmers in South African Bushveld 2002

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## Abstract

Sustainable soil fertility management (SSFM) strategies are crucial for smallholder farmers in South African bushveld to maintain nutrient retention and improve agricultural productivity. Agricultural field trials were conducted with different SSFM practices including organic amendments (compost) and cover crops. Soil samples were collected at regular intervals for nutrient analysis using standard soil testing procedures. Initial results indicate a significant increase of up to 15% in nitrogen retention when compost was applied compared to control plots, suggesting enhanced nutrient cycling and availability. The SSFM strategies demonstrated potential benefits in sustaining soil fertility over time, although further research is needed to confirm long-term impacts and optimise implementation. Smallholder farmers should consider adopting SSFM practices based on local soil conditions and economic feasibility. Continuous monitoring of nutrient retention is recommended for optimal management. The empirical specification follows  $Y = \beta_{0+\beta} p X + \text{varepsilon}$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *African savanna, soil conservation, agroecology, crop rotation, organic amendments, precision agriculture, nutrient cycling*

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