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Impact of low-cost management techniques on population dynamics of plant-parasitic nematodes in sweet potato

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Abstract

Sweet potato is an important food security crop but its production is limited by various biotic constraints including plant-parasitic nematodes (PPN). In Kenya, current PPN management practices in sweet potato have several limitations hence the need for alternative low-cost management strategies. This study evaluated the impact of intercropping maize and sweet potato (MS) and application of *Tithonia diversifolia* (MG), cow (CM) and goat manure (GM) on population dynamics of PPN and the effect on metabolic footprints, ecological and functional indices. Field experiments were established in a randomized complete block design involving the four treatments and unamended controls. Soil samples were collected during long (LR) and short (SR) rains seasons. Forty-seven nematode genera were identified in both seasons. Principle response curves analysis revealed that goat manure had the most pronounced effect on PPN. There were differences in metabolic footprints, ecological and functional indices during LR and SR. In CM plots,

predator footprint was high during the long rains season. Functional metabolic footprints categorized all plots as degraded in both seasons except MS which was structured in SR. However, CM bordered a structured ecosystem in both seasons while GM bordered a structured ecosystem in LR. Goat manure may have enhanced the natural ability of soil to regulate PPN affecting sweet potato and it may provide an alternative sustainable method of PPN control for smallholders.

Keywords

Functional metabolic footprint
Goat manure
Ipomoea batatas
Structure index