Effect of Integrated Soil Fertility Management Interventions on the Abundance and Diversity of Soil Collembola in Embu and Taita Districts, Kenya

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The study aimed at identifying soil fertility management practices that promote the Collembola population, diversity and survival in the soil. Soil samples were randomly collected from on farm plots amended with: 1-Mavuno (Ma)-is a compound fertilizer containing 26% Potassium, 10% Nitrogen, 10% Calcium, 4% Sulphur, 4% Magnesium and trace elements like Zinc, Copper, Boron, Molybdenum and Manganese), 2-Manure (Mn), 3-Trichoderna (Tr) inoculant (is a soil and compost-borne antagonistic fungus used as biological control agent against plant fungal diseases), 4-Farmers practice ((FP) where Tripple Super Phosphate (T.S.P.) and Calcium Ammonium Nitrate (C.A.N.) fertilizers are applied in the soil in mixed form), 5-Tripple Super Phosphate (T.S.P.), 6-Calcium Ammonium Nitrate (C.A.N.). These treatments were compared with 7-Control (Co) (where soil fertility management interventions where not applied). Soil Collembola were extracted using dynamic behavioural modified Berlese funnel and identified to the genus level. Occurrence of Collembola was significantly affected by soil fertility amendments in both Taita and Embu study sites (P<0.05). Twenty two genera of soil dwelling Collembola were recorded, with control and organic manure treated plots recording high diversity with a Shannon 1.86 in Embu and a Shannon 2.09 in Taita, respectively. There was significant difference (P<0.05) of seasonality on soil Collembola occurrence at both Embu and Taita. Application of cow manure and addition of Trichoderma inoculants promoted the soil Collembola. The study has demonstrated that application of organic amendments encouraged the soil Collembola while inorganic fertilizers negatively impacted on these soil organisms.