

The effect of continued application of mineral and organic fertilizers on soil agro-properties and soil microbial populations and activity, was studied in a long-term field experiment at Kabete, in the highlands of Kenya. The area is sub-humid with an average bimodal rainfall of 980 mm and two cropping seasons per year. The main treatments were 3 rates of inorganic N and P fertilizers, farmyard manure (FYM) with or without stover retention. Maize and beans were planted during the long and short rain seasons, respectively. Total % N declined by 25% from 0.16% while soil organic carbon decreased from 2 to 1.2%. The soil pH value dropped by 1.3 units from 5.5 but the decrease in bulk density from 1.04 to 1.08 g cm⁻³ soil in the no-input control treatment was not significant. Use of FYM alone or in combination with chemical fertilizers led to higher numbers of microbes and enhanced microbial respiration than use of chemical fertilizers alone. The topsoil layer had significantly ($p = 0.05$) higher microbial activity than the sub-soil regardless of management strategy. Bacteria were more numerous $\{1 \times 10^5$ cfu (colonies forming units) g dry wt. soil⁻¹} than fungi (1×10^3 cfu g dry wt. soil⁻¹), which may lead to more soil organic matter (SOM) mineralization and less SOM retention in this cropping system. Integrated use of organic inputs such as farmyard manure and chemical fertilizers is recommended to maintain soil productivity under continuous cultivation.