**ABSTRACT**

Unbalanced fertilization is a problem affecting potato production in Kenya, where continuous use of nitrogen-phosphorus fertilizer (diammonium phosphate: DAP) has led to depletion of other macro and micronutrients. Hence, the need to assess alternative soil amendments including use of multinutrients compound fertilizer and canola green manure in potato production. Field and pot experiments were conducted in Nakuru during the period from August-December 2019 using two potato varieties (Shangi and Kenya Karibu) in randomized complete block design (RCBD) in split plot arrangement replicated three times (variety as main plot and combination of fertilizer and canola green manure as main plot). Two canola green manure levels (with and without), four levels of fertilizer (NPK + Ca + Mg + micronutrients) at 0 (F1), 250 (F2), 575 (F3), 900 (F4) kg ha−1 and recommended fertilizer rate (DAP at 500 kg ha−1 + Calcium ammonium nitrate (CAN300 kg ha−1), (F5) as a positive control were used. Pot experiment was carried out at Egerton university farm in a completely randomized design (CRD) with three replicates. Four levels of canola green manure (100, 75, 50 and 0 g kg−1 soil) and five levels of fertilizer (NPK + Ca + Mg + micronutrients) as used in the field experiment were used. The results indicated that fertilizer F4 increased potato tuber dry weight and plant height by 5.0 and 5.0%, respectively over the normal recommended F5 under field experiments. F4 also increased nutrients (nitrogen, phosphorus and potassium) uptake by 13, 26 and 3%, respectively under field experiment compared to F5. Generally, canola green manure did not show a significant effect on plant height and yield, though F4 with green manure exhibited an increase of 7 and 38% on plant height and tuber dry weight, respectively. The study recommends the use of F4 (900 kg ha−1 of NPK + Ca + Mg + micronutrients) for potato production in Kenya and further recommends additional research to assess compound fertilizers over more seasons with monitoring and evaluation of their effect on soil physical and chemical properties and their economic feasibility.