ABSTRACT

Kenya's tea industry depends predominantly on imported compound NPK fertilizers to replenish nutrients removed through plucking. These fertilizers cannot be easily manipulated for specific soils and tea clones. They also frequently become hazardous within tea-growing environments. In this respect, two fertilizer blends containing NPKS 25 : 5 : 5 : 4 + 9Ca + 2.62Mg and NPKS 23 : 5 : 5 : 4 + 10Ca + 3Mg with trace elements have been produced commercially in the country. However, the extent to which the blended fertilizers may contribute to optimal economic gains without degrading the environment has not been determined. This was the knowledge gap that this study seeks to address. The goal of this study was to evaluate the economic efficacy of fertilizer blends with the aim of identifying optimal levels of application which would maximize tea productivity with minimal negative impacts on the environment. The study hypothesized that blended fertilizers maximize productivity of tea clones with minimal environmental damage. The fertilizer blends were evaluated in two study sites, i.e., Timbilil Estate in Kericho and Kagochi farm in Nyeri. The sites were selected purposefully, one in the eastern and the other in the western tea-growing areas. The trial was laid out in randomized complete block design with two fertilizer blends and the standard NPK 26 : 5 : 5 as control. The treatments were applied at four fertilizer rates (0 (control), 75, 150, and 225 $kg{\cdot}N{\cdot}ha^{-1}{\cdot}yr^{-1}$), replicated thrice. Leaf samples were collected and analyzed for nutrient uptake as well as associated yields and economic trends. The economic optimum nitrogen rate (EONR) was achieved at 75 $kg{\cdot}N{\cdot}ha^{-1}{\cdot}yr^{-1}$ at Kagochi with all fertilizers, while at Timbilil, EONR was variable, between 75 and 225 $kg{\cdot}N{\cdot}ha^{-1}{\cdot}yr^{-1}$ with fertilizer types. This study has shown that, based on the economic point of view, Blend "A" was the most efficient and consistent fertilizer in production and economic returns across the two sites.