

ABSTRACT

Maize production in Malawi is limited mainly by low soil N and P. Improved fallows of N-fixing legumes such as *Tephrosia* and *Sesbania* offer options for improving soil fertility particularly N supply. The interactions of *Tephrosia* fallows and inorganic fertilizers on soil properties, N uptake, and maize yields were evaluated at Chitedze Research Station in Malawi. The results indicated that the level of organic matter and pH increased in all the treatments except for the control. Total N remained almost unchanged while available P decreased in all plots amended with *T. vogelii* but increased in *T. candida* plots where inorganic P was applied. Exchangeable K increased in all the plots irrespective of the type of amendment. The interaction of N and P fertilizers with *T. vogelii* fallows significantly increased the grain yield. The treatment that received 45 kg N ha⁻¹ and 20 kg P ha⁻¹ produced significantly higher grain yields (6.8 t ha⁻¹) than all the other treatments except where 68 kg N ha⁻¹ and 30 kg P ha⁻¹ were applied which gave 6.5 t ha⁻¹ of maize grain. *T. candida* fallows alone or in combination with N and P fertilizers did not significantly affect grain yield. However, *T. candida* fallows alone can raise maize grain yield by 300% over the no-input control. Based on these results we conclude that high quality residues such as *T. candida* and *T. vogelii* can be used as sources of nutrients to improve crop yields and soil fertility in N-limited soils. However, inorganic P fertilizer is needed due to the low soil available P levels.