Nematodes and Weeds Control Effects of *Pueraria phaseoloides* and *Flemingia macrophylla* Fallows on Establishment, Survival and Yield of Plantain

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Abstract

The yield of plantain (*Musa* spp., AAB Simmonds) declines sharply after 1–2 years of cropping in West and Central Africa, due mainly to weeds and nematodes. A trial was carried out from January 2002 to October 2005 under two land-use systems (LUS) comprising 4–5 year-old bush fallow, dominated by *Chromolaena odorata* (L.) R. M. King & H. Rob, and a 20 year-old secondary forest, in three villages in southern Cameroon, to assess the effectiveness of *Pueraria phaseoloides* and *Flemingia macrophylla* as planted fallows for weed suppression and reduction in nematode damage of the plantain root system, and determine the yield response of different plantain sucker types to the weed suppression and reduced nematode damage. In each LUS, the treatments were a factorial combination of three levels of fallow system and four levels of plantain sucker type arranged in a randomised complete block design. Total above-ground biomass production of *P. phaseoloides* was 7.45 Mg ha^{-1}, 4.2 times higher than *F. macrophylla* (1.78 Mg ha^{-1}; $P < 0.05$). The high biomass of *P. phaseoloides* resulted in a significantly greater reduction in total weed biomass compared to *F. macrophylla* in both wet and dry seasons. Comparing the planted fallows, a sustained reduction in soil nematodes population was only under *P. phaseoloides*. Plantain establishment and survival rates were of decreasing order: PIF (nursery)-derived "Essong" > Boiling water-treated "Essong" > Untreated "Essong". *P. phaseoloides* produced significantly ($P < 0.05$) the highest plantain yield. There were no differences between the natural regrowth and *F. macrophylla* for all the plantain yield parameters. Sanitizing suckers (boiling and nursery-derived) increased actual yield and quantity of edible bunches by 35% and 26%, respectively, compared to the untreated. It was concluded that *P. phaseoloides* had the greatest positive effect on the growth and yield of plantain.