

Appraisal of composts for suppression of *Meloidogyne* species and enrichment of micro-arthropods in soybean fields

Jonathan Atungwu, Olajire Lawal, Steve Afolami & Christopher Adejuyigbe

Abstract

Meloidogyne species remain one of the major constraints to production of soybeans (*Glycine max* (L.) Merrill) in Nigeria. Ecologically minded management approaches are being promoted in order to reduce environmental and human health hazards associated with overdependence on synthetic nematicides. Composted manure provides one of the most acceptable nematode control methods in an organic soybean production system. The comparative efficacy of six composts in the management of *Meloidogyne* spp. of soybean was evaluated. The composts were prepared using fresh plant leaves of *Chromolaena odorata*, *Tithonia diversifolia*, or *Carica papaya*, stacked with poultry manure or cattle manure, in ratio 3:1 and applied at the rate of 5 t ha⁻¹ in a field planted with *Meloidogyne incognita* (Mi)-susceptible soybean variety, TGx 1019-2EN, inoculated with *M. incognita* eggs, laid out in a Randomized Complete Block Design with six replications. All treatments significantly reduced Mi populations by 76.6–94.9% with attendant significant ($p < 0.05$) decrease in number of galls produced on soybean roots compared with the control. Compost application stimulated populations of micro-arthropods by 46.7–82.4% compared with the control. Gamasids had the highest population among the micro-arthropods encountered. The low population of *M. incognita* in compost-amended plots may be linked to the predatory effect of the gamasids. This result provides an impetus for the development of nematode control using customized compost in organic soybean production.

Keywords: biological control, compost, *Glycine max*, *Meloidogyne incognita*, nematode, organic farming, soybean
