ASSESSING THE PHYTOTOXICITY OF BANANA LEAF AND LAWN CLIPPING COMPOST USING SEED GERMINATION AND PLANT GROWTH BIOASSAYS

ABSTRACT

Phytotoxicity refers to the "intoxication of living plants by substances present in the growth medium, when these substances are taken up and accumulated in plant tissue" (Araujo and Monteiro, 2005).

The phytotoxicity of two types of compost was analyzed using seed germination and plant growth bioassays. Seeds from three different plant species were incubated in the dark and germination and radicle development were analyzed. A plant growth bioassay was conducted to overcome possible deficiencies of the germination test; three plant species were planted in a polyethylene cover greenhouse to simulate normal field conditions. Plant growth parameters namely root length, shoot length, fresh and dry weight and leaf area index were generated after plants developed their first true leaves.

Results shows that the banana compost exhibited a higher level of toxicity than the grass compost under evaluation. The plant growth bioassay shows that there was no significance between the growth parameters of the grass compost and those of the control (pro-mix). It was also noted that leaching was able to reduce the phytotoxic effects displayed by the compost.

The phytotoxic effects of these two composts were attributed to the presence of high levels of soluble salts associated with high electric conductivity (EC). The levels of heavy metal present in the compost were negligible and were not linked to the phytotoxicity of the compost.