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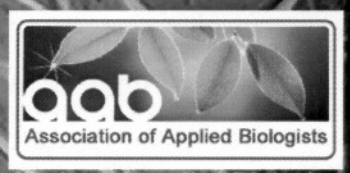

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The effect of soil disinfection on nematode biodiversity

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ABSTRACT

The nematode community was studied in terms of abundance, trophic and generic structure, life strategy and diversity, in agricultural soils disinfected either with chemicals, namely metham sodium, or with a mixture of organic additives. The latter consisted of neem cake, basil oil, marigold and clove oil, which are all believed to have a nematicidal action when used as soil amendments. Metham sodium is often used for soil disinfection, especially since methyl bromide has been phased out.

A field plot experiment was set, in an area which was used for cultivation of shell beans. Two months before the new plantings of the year, six replicate plots (10x10m each) were treated with metham sodium, six were treated with the organic amendment and six received no disinfectant and were used as control. Surface tillage with a disc harrow followed the application of disinfectants for the incorporation of the latter into the soil. Control plots were also tilled. Two samplings were carried out; the first just before treatments and the second after one month.

Chemical disinfection reduced significantly all plant feeders and fungivores, leading to a reduction of total nematode abundance. Organic amendments increased significantly both bacterivores and fungivores, and consequently total nematode abundance. However, both treatments reduced the % contribution of phytoparasites to the total nematode community in favor of microbial feeders, i.e. bacterivores and fungivores.

Maturity Index decreased after both treatments, due to the increased % contribution of c-p 1 bacterivores to the community of free living nematodes. Due to the same reason, Channel Index decreased and Enrichment Index increased after organic amendments. The same holds for the chemically treated plots, where the decline of c-p 2 fungivores is also important for shaping these indices. Despite the differing effect of the two treatments on the abundance of plant feeding functional guilds, the % contribution of c-p 3 phytoparasites to the community of plant feeders was raised in both cases. This resulted in the increase of the Plant Parasitic Index, which was significant in the organically treated plots. Structure Index did not change significantly after treatments, because functional guilds with c-p value ≥3 had a quite low contribution in all cases.

Generic diversity was higher after both treatments. This was mainly due to the decline of the c-p 2 phytoparasitic *Paratylenchus*, which overdominated the nematode community at the beginning of the experiment. In the organically treated plots, higher diversity was also due to increased number of genera.

In the control plots, we also observed an increase of the contribution of c-p 1 bacterivores and a decline of *Paratylenchus,* which implies that these changes might be partly due to the tillage.

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