

CASE STUDY: The Disappearing Nematodes

Location: Waimanalo, O'ahu

Background

An herb farm was having problems with *Fusarium* and root-knot nematode (*Meloidogyne javanica*) for their basil production. Preplant root-knot nematode populations were seemingly low, 47 juveniles/250 cm³ soil, ranging from 0 to 320. However a tomato bioassay of the same soil resulted in up to 95% root galling in plots where the root-knot nematode was not even detected in the preplant sampling. The root-knot nematodes were present in the field but at non- to barely detectable levels.

Initial Experience

Basil was planted in plots that had been treated with Clandosan, Nematrol or Telone II. Four months later, root-knot nematode populations had increased to an average of 3,800 juveniles/250 cm³ soil across treatments. Clandosan-treated plots had the highest nematode populations. Telone II and Nematrol had the lowest nematode populations.

The site was sampled again six months later. Root-knot nematode populations were undetectable in these former basil plots. However, substantial numbers of free living bacterial feeding nematodes were found.

What Changed?

The grower had adopted two practices that probably reduced their root-knot nematode problem. The grower began incorporating compost at high rates (tons/hectare) and growing a shorter duration crop.

The Theory behind the Change

Compost has previously been documented to reduce plant-parasitic nematode populations. Composted chicken manure is among the best of the composts for nematode control. While there may have been some direct toxicity or 'nematicidal' activity associated with chemical by-products of the



Overview of Sustainable Techniques Used

- Soil amendments - compost

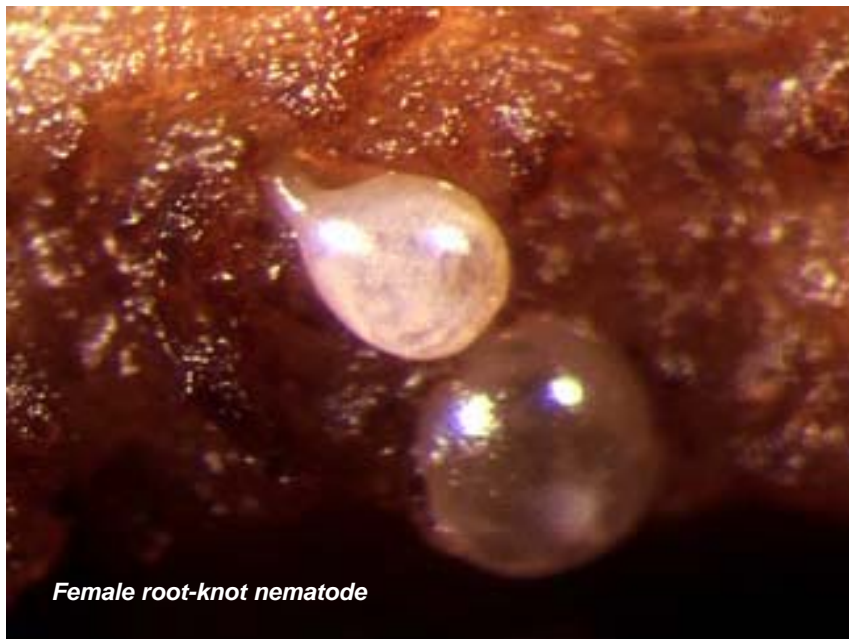
- Selection of poor or nonhost crops

- Rotation

compost, we suspect that the incorporation of compost into the soil increased the soil biological activity. The increased biological activity was suggested by the large numbers of free living nematodes that we recovered. A more complex soil food web is associated with reduced plant-parasitic nematodes in the soil.

Growing a short duration crop does not allow the root-knot nematode to complete its life cycle. The root-knot nematode requires about 28 days to infect a plant, develop into an adult, and produce eggs on a good host. On a poorer host, this cycle will take longer. If the host is not in the ground long enough for the root-knot nematode to complete its life cycle, subsequent plant damage is reduced. This technique demonstrates rotation on a slightly different scale than which we may be accustomed. Nonetheless, the rotation is effective.

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Female root-knot nematode