Pest Control No. TPC1

Root nematodes, *Family Heteroderidae*

Nematodes are a group of soil-living pests which are not easy to study. They are always in the soil but usually in harmless quantities. When numbers increase however, they can cause severe damage to crops, transmit virus diseases and are associated with fungal problems. Depending on the part of the plant attacked, they are called leaf, stem or root nematodes. This leaflet deals with root nematodes as they are the most common group.

Host plants

Nematodes affect most crops including fruit trees, bambara nuts, brinjals, beans, coffee, cowpeas, cucurbits, potatoes, lettuce, melons, okra, onions, peas, sorghum, sugar bean, tomatoes, cotton, millets, sunflowers and tobacco.

Symptoms

Above ground damage: poor development of the leaves and fruit, yellowing of the leaves, decrease in yield, an increased susceptibility to pathogens and sometimes death. The ends of branches can die in tree crops.

Root symptoms: Swellings on the roots of varying sizes, dead spots around nematode-feeding areas or swelling and distortion of the roots, depending on the plant and the species of nematode.

Description of pest

Nematodes are very small worm-like insects that live in the soil. They feed on soil bacteria, fungi, other nematodes and some feed on plant roots. Females are usually very swollen and depending on the species of nematode, eggs are laid inside the plant root or in the soil. Males usually measure around 1mm long and have thin bodies. Most nematodes are so small that you cannot see them. They are therefore identified by the damage caused to plants and their roots.

Life cycle

The egg sacks that the females carry may contain 300 to 1000 eggs. The larvae can infect the plant at their second stage. They feed, develop and some become males but most become thickened, egg-laying females. Their life span depends on temperature: at 20°C they will live for 57 days, at 27°C they will live for 2 to 30 days.

Prevention and control

Most nematodes are essential to good soil structure as they break down organic matter into humus. Some also help to control harmful larvae of insects such as armyworms, beetles, bollworms and leaf minors. However they can be a pest and numbers of root nematodes increase when soil is ploughed or organic matter content decreases.

Soil disturbance: It is best to minimise soil disturbance, such as ploughing and hoeing, as much as possible during a nematode infestation to avoid spreading nematodes from one place to another. You should clean agricultural implements, such as hoes and mattocks, after usage in a nematode infested area to avoid spreading.

Organic substances: Add as much organic matter to the soil as possible including seed cakes of castor (*Ricinus communis*), groundnut (*Arachis hypogea*), neem (*Azadirachta indica*), compost, manures and legumes that are dug in. Goatweed (*Ageratum conyzoides*) is a nematicidal plant. Use it as a mulch in between growing plants. This will add organic matter to the soil as well as acting as a repellent for nematodes.

Plants with nematicidal properties: Some plants repel nematodes because their roots give off substances into the soil which the nematodes do not like. These plants can be used in a rotation system. Nematicidal plants include garlic, cassava, leeks, mustard, onions, shallots, pawpaw, African or French marigold and Mexican poppy. Some grasses are also effective such as weeping lovegrass (*Eragrotis curvula*), katambora rhodes grass (*Chloris gayana*), couch grass (*Cynodon dactylon*) and sabi panicum (*Panicum maximum*) and paraguay grass (*Paspalum notatum*).

Crop rotation: Growing the same crop in the same area allows nematode numbers to increase as they have a constant supply of suitable food. Rotation separates pests in space and time from their host plants. Rotations using the plants mentioned above are possibilities. Growing the grasses in extended rotation (several years), can decrease nematode numbers significantly.

Resistant crops: Garlic, leek, onion, shallots, early planted green maize and sweet corn are said to resist nematode attacks. Broccoli, cabbage, cauliflower, chillies, kale, rape, radish, leaf mustard, turnip, sweet potato, are able to tolerate a nematode attack. Indigenous plants are usually more resistant to indigenous pest and disease attacks than foreign varieties.

Field hygiene: Remove roots showing nematode attack immediately after harvest, dry and burn them. The leaves and stems of plants can be composted but not the infected roots because there is a risk of spreading the pest to clean soil.

Flooding: Flooding or water-logging of the soil for several weeks or months also leads to much reduced infestation. Larvae and adults are killed, however the eggs are much more resistant.

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