



Nematodes

Controlling and Reducing Nematodes



Lesion nematode damage on a squash plant.
S&L Farms Homestead FL, 2015.

Nematodes are at their most vulnerable to control measures during their active phase in soil, when they are searching for the roots of plants.

As such, effective management of their numbers usually requires an integrated, proactive approach which starts before planting and, for most forms of fruit and vegetable, as well as field crops production, takes account of the time and money involved.

In the majority of situations, the first step is nematode identification and population counts from soil samples. Once these are completed, the most appropriate combination of cultural, physical and chemical control methods can be introduced into the production system.

Cultural Control

There are a number of cultural measures which can minimise the risk of nematodes, although they vary in their effectiveness. Using healthy, certified seed and propagating stock can prevent the pest from being introduced in the first place.

In addition, effective weed control and attention to crop husbandry can reduce the hosts available for nematodes to feed on or to harbour viruses.

In the same way, crop rotation and the use of drilling date can help to disrupt the pest's life cycle – as without host plants, most nematode species are unable to thrive.

In hotter climates, soil solarisation is often used. In this technique, cultivated ground is covered and sealed with plastic for at least 45 days, so that it heats up and nematode numbers are reduced.

Physical Control



Cyst nematode (*Globodera pallida*) eggs

Rolling field crops at the right stage can be helpful, as the nematodes will be crushed between the soil particles and their damage will be reduced.

In the same way, soil cultivation can reduce nematode numbers, especially in lighter soils, where the resulting abrasion can be effective. Alternatively, flooding of soils for weeks can knock numbers of certain nematode species.

Green manure crops, especially brassica species, incorporated into the soil, can help with the control of nematodes, as their glucosinolate content has a toxic effect on the pest.

With some nematode species, trap crops can be used. These are designed to stimulate egg hatch and pest activity, so that when the crop is destroyed, nematode numbers are reduced.

Resistant/Tolerant Varieties

The choice of resistant or tolerant varieties can allow crops to be grown in fields where nematodes are known to be present.

While tolerant varieties will be able to withstand or recover from damage and produce a yield in the presence of nematodes, they will also allow nematode multiplication to occur. Resistant varieties, however, will either prevent significant nematode feeding or restrict nematode multiplication.



Root Knot Nematode damage to a pepper. Lewis Taylor Farms, Tifton GA, 2014.

Chemical Control

Chemicals sold as nematicides can be divided into fumigants and non-fumigants. Many of these are now being phased out, due to their toxicity and effects on the environment, so the options are reducing.

Fumigant nematicides must be applied several weeks before a crop is planted and soil conditions are critical for effective results. All have a high cost and require specialist handling and application, so their use is restricted mainly to high value crops.



Farm Advisor Joe Nunez compares Nimitiz vs Vydate on tomato plants. Cooperative Extension Kern County - University of California, 2014

Non-fumigant nematicides are applied to the soil at, or immediately prior to planting. Organophosphates and carbamates tend to paralyse or immobilise nematodes for a short period, giving crops the chance to develop to a stage where they can escape the effects of nematode feeding.

However, more recent non-fumigant nematicide introductions have been well received by the industry. Bringing improvements in efficacy, safety and ease of application, they are changing the way that growers can manage nematode populations.

A good example of this is Nimitz from Adama, which is based on a new active ingredient, fluensulfone. Nimitz is the first new nematicide to be developed in over 20 years.

A contact product in a liquid formulation, it is simply sprayed onto the ground before being incorporated ahead of planting, or applied through drip irrigation equipment. For turf and specific territories there are granular formulations.

Target nematodes are killed within 24-72 hours – unlike the paralysing action of organophosphate and carbamate chemistry – with no detrimental effect on non-target species.

Controlling Nematodes

- Identify type and population of nematodes
- Cultural and physical control methods will reduce pest numbers
- Bio-control is effective in right conditions
- Fumigant nematicides involve specialist application, crop interval restrictions and higher cost
- Non-fumigant nematicides are applied at planting
- Nimitz represents efficacy, safety and environmental breakthrough

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