

Nematodes and their Control

Nematodes are tiny thread-like worms too small to be seen with the eye. They live in the soil and feed on the root juices. Root-knot nematodes (RKNs) are a type which damage roots in a way that prevents them absorbing water and nutrients effectively. This reduces the growth and yield of the crop. Nematode infestation may also increase the likelihood of other diseases such as bacterial wilt and fusarium wilt.



Tomato roots showing severe root-knot nematode damage (galling)

Controlling nematodes

Nematodes can be spread by transplanting infested seedlings, in soil washed down slopes, or in soil adhering to farm implements and farm workers. They may also be spread by irrigation water. They can survive for about 2 years in soil without a suitable host plant. RKN are not active below a temperature of 15 degrees centigrade so susceptible crops can be grown during cool times of year. Damage caused by nematodes: Heavily infested roots are severely distorted and swollen -see picture - but farmers are often not aware of this symptom since it is out of sight under the soil. Farmers are more likely to notice that affected plants are stunted and yellow and have a tendency to wilt or even die in hot weather. The problem is most serious on light sandy soils and in furrow-irrigated crops.

- Rotate tomato crops with other crops so that RKN numbers do not build up.
- Do not locate seedbeds where susceptible vegetables have been grown previously.

- Use resistant cultivars with the 'VFN' label. These include Rossol VFN. The N means nematode tolerant. Check your seed dealer for local availability of tolerant types.
- After seedbed soil preparation, burn wood or other material on its surface to make a hot fire which lasts over an hour so that heat penetrates the soil and kills any nematodes
- Present. Alternatively, solarization may help but it takes longer. If a plastic sheet (preferably clear) is laid on the well-watered seedbed and left for a few weeks, the heat of the sun will destroy most pests and pathogens - including RKN - in the top layers of soil.
- After harvest, uproot entire plants and destroy crop debris.
- Plant tops can be composted but any infested roots should be burnt since nematodes may survive the relatively low heat of the compost heap.
- Flooding the soil for a few weeks will reduce nematode numbers, as will bare fallow.
- Practice mixed cropping or rotations with French or African marigolds (*Tagetes patula* or *Tagetes erecta*) or Sesame or Sunnhemp which prevents nematode maturation.

The *STRong rotation system* can be used. The letters S, T and R mean *Susceptible* (easily attacked by nematodes), *Tolerant* (not badly attacked by nematodes) and *Resistant* (not attacked by nematodes). The table below, developed by African Farmers Organic Research and Training (AFOREST) in Zimbabwe, shows the susceptibility of various crops to nematodes.

Table of crop susceptibilities to root knot nematode

Susceptible	Tolerant	Resistant	Nematicidal properties
Beetroot Swiss chard (leaf beet) Lettuce Cucumber Melon Gourd Pumpkin Squash Bambara nut Beans Cowpea Okra Egg plant Irish potato Sweet pepper	Brassicas Raddish Tsunga Turnip Sweet potato Chilli pepper	Garlic Leek Onion Shallots Maize Millet Sorghum Sweet corn Cassava Rhodes grass Several other grasses	Clean. bare fallow Marigold (<i>Tagetes</i> sp) Sesame Sunnhemp (<i>Crotalaria juncea</i>) prevents nematode maturation

Tomato			
Carrot			
Celery			
Parsley			
Peas			