

Managing Root Knot Nematodes in Gardens and Landscapes

Root knot nematodes (RKN) are tiny worm-like soil dwelling creatures that are too small to be seen without a magnifying lens. They cause characteristic swollen areas along a root that look like knots or larger swollen areas. Their feeding disrupts the movement of water and nutrients to the plant causing drought and nutrient deficiency symptoms.

RKN's attack over 500 plant species, including landscape trees, shrubs, flowers, fruit, and vegetables. After entering a plant root, a female nematode can produce several hundred eggs that hatch and may re-enter the soil and live up to a year.

There is not a chemical cure for RKN's in the home landscape and garden, but we can utilize one or more of the following practices to reduce their numbers and the damage they cause to plants.

Resistant or Tolerant Species and Cultivars

A web search can provide a list of plant species or varieties that either are resistant to or can tolerate attack by root knot nematodes. Here is an example of such a list: https://content.ces.ncsu.edu/control-of-root-knot-nematodes-in-the-home-vegetable-garden#section_heading_5072

Trap Crops

Some types of marigolds produce chemicals inside the roots and in soil next to the roots. French marigolds (*Tagetes patula*) are among the best at this. The varieties 'Nemagold', 'Lemon Drop', 'Petite Blanc', 'Queen Sophia', 'Single Gold' (aka 'Nemagone'), 'Tangerine' (not 'Tangerine Gem'), and the hybrid 'Polynema' are examples of those proven in research trials. If you can't find one of these varieties, choose other French marigold varieties, as most will have at least some beneficial effects.

Some African types of marigolds (*Tagetes erecta*) also provide nematode suppression and have the advantage of not beginning to bloom as soon after planting in spring and summer, thus enabling them to develop a more extensive root system to encounter more RKN's in the soil. The variety 'Cracker Jack' has shown good nematode suppression in research trials.

To achieve maximum effect, marigolds should be densely seeded immediately after the winter or spring vegetable crops are removed at a rate of about 25 plants per 10 square feet. Allow them to grow at least 3 months to have the maximum effect.

Marigolds can be mowed and tilled into the soil to decompose, which may also help suppress RKN's.

Cereal (grain) types of rye can be used in the cool season to suppress RKN's, since they are not able to reproduce in the rye roots. Spread cereal rye seed in late October to mid-November at a rate of 3/4 to 1 pound per 100 square feet. Allow it to grow until late February or early March, and then shred it with a mower and/or string trimmer. Then rototill it in so the decomposing plant parts can release a natural chemical



that also helps reduce nematode numbers. Wait 3-4 weeks to plant crops in these areas.

Solarizing

This practice uses the energy of the sun to superheat the soil in the top 4+ inches, killing weed seeds, soil insects, and RKN's which are killed by temperatures around 115 degrees or higher. Rototill the soil to break up clods, form beds, water to moisten the soil, spread 2-4 mil clear plastic over the soil, and cover the edges of the plastic with soil to prevent escape of the hot air. For increased heating effect add a second layer of clear plastic after placing some bricks, 2X4's, or sections of 2" PVC pipe over the area to create an inch or two of air space between the two layers.

Solarizing must be done in sunny locations for at least 4 weeks during the hot summer months if it is to be effective. After solarizing, don't spade or till the soil as that can bring weed seeds and RKN's from below the heat-killed zone to the surface.

Fallowing

Leaving nematode infested areas unplanted for a year of two, will significantly reduce their populations. Keep soil moist to promote nematode egg hatching during this time and they will starve without roots on which to feed. Keep weeds out of this area since many types of weeds host RKN's in their roots. Fallowing can be used in combination with trap crops or solarizing for increased benefits. These three practices should be part of a rotation cycle to keep nematode populations at a minimum.

Sanitation

Root knot nematodes are usually brought into new areas on infested soil, plants, or garden tools previously used in nematode infested soil. Check new transplants by turning them over and lifting off the growing container to examine roots for the characteristic swollen areas. RKN's can be found in many soil types but proliferate best in sandy soil. Therefore, soil blends that include sand are more likely to harbor RKN's. Wash the soil off rototillers and all other tools before using them in other areas of the garden.

When RKN's are discovered in the garden, remove the infested plants along with as many roots as you can. Discard infested roots in the trash, not the compost bin!

Plant Care

Mix compost into the soil, provide adequate fertilization, and water as needed to maintain consistently moist soil to provide plants under attack by RKN's the care they need to grow and produce despite the negative effects of these nematodes.

Growing transplants to a larger size before planting in the garden can give plants a head start on nematodes.

Products

Products that contain chitin (a substance in crab, shrimp, and crawdad shells) can increase the population of certain soil microorganisms in the soil that feed on nematodes and can aid in their control.

There are a few plant-based products on the market with claims to reduce nematode problems on plants. These are based on various plant extracts including saponins, which are soap-like substances produced by some plants. Such products are generally regarded as having low to medium effectiveness.