



University of California Cooperative Extension

NEWS RELEASE



Kern County • 1031 S. Mt. Vernon Avenue • Bakersfield, CA 93307 • 661-868-6200

October 12, 2009

Joe Nunez, Farm Advisor
Vegetable Crops/Plant Pathology
661-868-6222

CONTROLLING NEMATODES IN THE GARDEN

Kern County is a great place to live if you like to garden. Most vegetables do well in our fertile soils. Plus with our climate we can grow vegetable all year long starting with summer veggies in the spring and winter vegetables in the fall. But all that gardening on a small plot of ground can have its toll on the soil with the buildup of soil pests. Probably the most common one and the most hideous one being nematodes, particularly root knot nematode.

Nematodes are microscopic worm-like animals that live in the soil. Many are free living feeding on bacteria, fungi, other nematodes, etc. However, some are plant parasites that feed on plant roots. Over time they can buildup up in numbers in the soil resulting in damage caused to the plants. There are many different types of plant paretic nematodes but, the one gardeners are most familiar with is root knot nematode.

Plants that are infected with root knot nematode are stunted, yellow, and overall not very vigorous. The way to easily determine if root knot nematode is the problem is to look at the roots of the plant. Roots that have been infected by root knot nematode can easily be identified by digging the roots up and looking for galled, swollen, and distorted roots. On most vegetables the symptoms can be easily seen, but some plants like onions and garlic it is more subtle.

The reason the roots become swollen and galled is that once the female nematode reaches a root, it pierces the root and enters partially into the root. Once embedded in the root, the female nematode excretes enzymes into the plant which cause the plant cells around her to enlarge. It is from these enlarged plant cells from which the nematode takes nutrients from. Meanwhile her tail end is outside the root and it becomes enlarged as it becomes filled with thousands of eggs. Apparently males are not needed and are rare to find.

So what can a vegetable gardener do to solve this problem? Well, there is no magic bullet for nematodes. It requires some planning and time. Actually the best strategy is prevention because once root knot becomes a problem it is difficult to control.

If you have large enough yard space, try moving your garden location every year. Also do not grow the same vegetables in the same spot in the garden every year. Rotate within the garden with different vegetables to help keep nematodes from building up on one particular crop.

Also use nematode resistant plants whenever possible. Some tomatoes varieties have excellent resistance to root knot nematodes. Heirloom varieties however, will likely not have any resistance to nematodes. Also continuously planting nematode resistance varieties in the same location can cause the breakdown of this resistance. That's another reason to make sure to rotate your vegetables within the garden.

A sure fire way to control nematodes and many soil borne pests is the use of soil solarization. Soil solarization works well in the Southwest parts of the US but needs to be done in the summer months to get the most of its effects. Soil solarization entails wetting the soil to be treated thoroughly and then covering it with a clear plastic tarp. The edges of the tarp are sealed all the way around with soil. As the sunlight energy passes through the clear plastic tarp, it hits the soil and is converted to heat energy and is trapped by the plastic tarp. A cycling of heating and cooling occurs between the daylight and nighttime hours. Over a period of 2 to 3 weeks this heating-cooling cycle will kill many pathogens including nematodes. The key to making this work is doing it in the summer months, only wetting the soil once, and using clear plastic tarp.

Adding shrimp or crab shell meal to the soil can also help reduce the nematode numbers in the soil. The egg cases of nematodes are composed of chitin, as are the shells of crabs and shrimp. Adding shell meal to the soil increases the number of microbes that break down chitin, including the chitin of the nematode egg cases. Shrimp and crab meal is sold as an organic fertilizer and can be found at organic garden suppliers.

Lastly, there are some crops that can be grown that can have a nematicidal effect if turned under as a green manure. Green manure is the term used to grow a crop and then incorporate it into the soil while still being green. Excellent green manure cover crops for the summer would be sesame, sunn hemp and certain black-eyed peas such as Iron Clay. In the winter months plants such as mustards and certain marigolds turned under as green manure would help reduce nematode populations. French marigolds (*Tagetes* spp) such as "Petite Blanc," "Queen Sophia," and "Tangerine" work best. One variety "Nemagold" has actually been bred and sold for use as a nematicidal green manure crop. Avoid Signet marigolds (*Tagetes signata* or *tennifolia*) because nematodes can actually increase on these.

Controlling nematodes in the garden begins with prevention and proper planning. If they do become a problem there are options a gardener can take. But controlling nematodes in the garden will make for a more bountiful harvest in the end.