



Guidelines for Collecting and Submitting Samples for Nematodes

To determine whether there is a nematode problem in a field, it is best to collect soil samples. Plant parasitic nematodes are microscopic roundworms that can be found in soil, roots, stems, and plant foliage. Nematode symptoms are not reliably recognized in a field because most of the damage is below ground. Typical symptoms of damage are yellowing, wilting, decline in growth, uneven growth in the overall field, and reduced yield. These vague symptoms are often misleading, could be caused by pathogens and other factors, and make it difficult to diagnose a nematode problem.

Guidelines on how to sample for nematodes

When a field is evaluated for nematodes, random soil samples should be taken throughout the site. Random sampling is important because nematodes are not uniformly distributed and usually exhibit a patchy distribution throughout the field. To evaluate, it is best to take subsamples in various areas of the field. When sampling in a field, be sure to collect from poorly growing plants as well as healthy ones.

If possible, it is advisable to take soil, root, and plant tissue samples in order to most thoroughly evaluate a crop for nematode damage:

- Soil samples: used to screen for plant parasitic nematodes that feed on plant root systems. Examples of such nematodes are root knot, ring, lesion, and dagger nematodes.
- Root samples: used to examine for diagnostic symptoms such as galls, knots, lesions, necrotic damage, and short stubby feeder roots. Examples of such nematodes are root knot, cyst, lesion, and citrus nematodes.
- Plant tissue samples: such tissues include leaves with angular necrotic lesions, bulbs with necrotic rots, and stems or fleshy tubers showing necrosis. Examples of nematodes causing these symptoms are foliar and stem & bulb nematodes.

When to sample

Plant parasitic nematode populations fluctuate throughout the year, so timing is key to fully assess the presence of and pressure from nematodes. Soil type and previous crop history can also significantly influence nematode populations. Sampling for nematodes in an existing field or orchard is best done in late summer to early fall seasons when populations are highest. If soils within a field differ in texture, or if crop growth is uneven and varies in appearance, it is highly recommended to take separate samples from each of the distinct areas.

Sampling method

- Tools and materials include: hand shovel or trowel, soil corer, plastic bags (5 lb capacity), waterproof marker, labels, and cooler with ice packs (to store samples).

- Depending on the amount of acreage involved, divide the field into sampling blocks (contact Kristi Sanchez for suggestions on a sampling strategy).
- Collect moist soil for samples. Do not sample an area where it is too dry or too wet.
- Soil and root samples may be collected from the rhizosphere and around the base of plants where organic matter usually accumulates (6 to 25 inches deep). Nematodes are most active round the root zone.
- From each sampling block it is best to take 5 composite soil samples. Each composite sample should consist of 5 to 8 random subsamples (scoops or cores) of soil.
- Homogenize the subsamples (scoops or cores) for each block by mixing them thoroughly in a bucket to create a uniform composite sample. Mixing soil by hand results in less damage and disturbance to the nematodes.
- Approximately 1 quart of soil is recommended for a final composite soil sample

Transport and storage of soil samples

- To avoid dehydration of nematodes, place the final sample into plastic bags. Make sure the bags are closed or sealed.
- After collecting, keep the soil cool to ensure viability of nematodes; store sample bags in a cooler, refrigerator, or cold room. Do not allow the sample to freeze.
- Avoid exposing the soil samples to direct sunlight or elevated temperatures.
- Label each sample with your name, location, current or previous crop, and other information (such as the upcoming crop to be planted).
- When shipping samples to our lab, include ice packs in the shipping container.

Shipping address: Contact nematologist Kristi Sanchez (ksanchez@trical.com).

For other questions contact Kristi Sanchez (ksanchez@trical.com) or Steve Koike (skoike@trical.com).