

Nematode Testing Services

The Plant Health Program conducts official surveys and laboratory testing for plant parasitic nematodes to facilitate the shipment of Oregon agricultural and forestry products to interstate and international markets. This official testing is required for the products to be eligible for a state or federal phytosanitary certificate. The certificate allows the product to be exported legally to other states and countries.

The most commonly tested products are grass seed, nursery plants, and timber. Soil from tree nurseries, vineyards, and potato fields is also tested.



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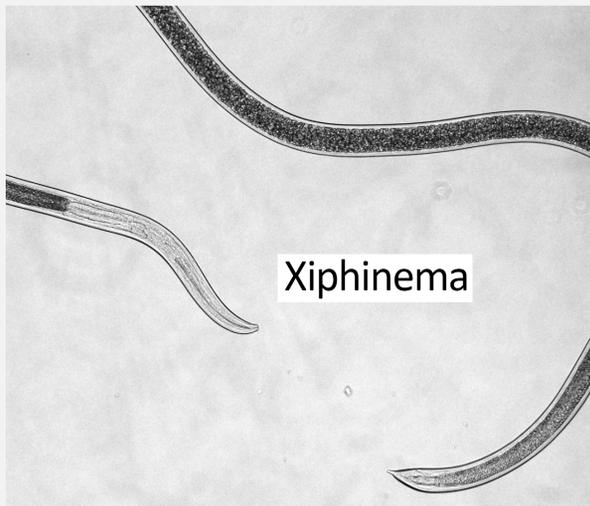
Nematode Testing



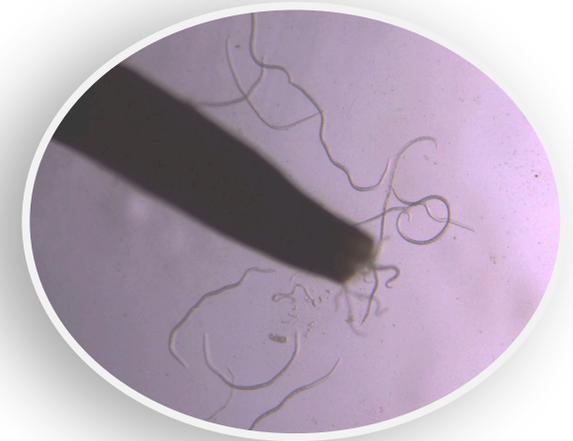
Oregon
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Nematode testing services

Nematodes are tiny worm-like creatures that can benefit or harm plant growth. The Plant Health Lab tests for nematodes that cause plant diseases and can be found in soil or in plant tissues. Nematodes do not move very far on their own, but can be readily transported in seed, plant tissues, or soil to new areas. Some of the most devastating nematodes have limited distributions geographically and the most important control measure available is to keep them out. Thus, other countries and states require testing for these parasites.



Standard nematode extractions cost \$35 per sample. However, to identify nematodes to species, molecular testing may be required. An additional fee of \$140 per sample would be charged. Nematodes are tested using a variety of methods that depend on the type of tissue being tested. These methods require 2-7 days to perform, with identification to species taking up to 2-weeks. Additionally, the importing state or country may dictate which testing method they will accept.



Nematode testing of seed crops

Many countries require seed being exported be tested for nematodes. Two nematodes that can be detected in seed are *Anguina* and *Ditylenchus*. *Anguina* replaces developing grass seed with galls filled with nematode eggs and *Ditylenchus* invades all above ground plant parts and can be detected in the seed of crops like alfalfa and garlic. Because it requires 48- to 72-hours to test seed for nematodes, this testing takes place on Monday, Tuesday, or Wednesday only.

Nematode soil testing

The ODA Plant Health Lab conducts soil surveys to maintain critical agricultural markets. Two nematodes commonly surveyed for include the pale potato cyst nematode, *Globodera pallida*, and Columbia root knot nematode, *Meloidogyne chitwoodii*. *G. pallida* was detected in Idaho in 2006. This nematode is of international quarantine significance, causing yield losses of up to 80% in some parts of the world.

M. chitwoodii is found mainly in Eastern Oregon affecting potatoes and other root crops; many countries have quarantines designed to prevent its introduction. Both nematodes attack plant roots, causing abnormal root growth and yield loss.

Soil is surveyed for nematodes using two methods; sugar centrifugation and soil cyst washer. The method used depends upon the nematode being looked for and the importing country or state may dictate which testing method they find acceptable. The sugar centrifugation method takes 24- to 48-hours to complete, while the soil cyst washer method takes 7- to 10-days. *M. chitwoodii* is tested for using sugar centrifugation, while *G. pallida* is tested for using the soil cyst washer.

Nematode testing of plant tissue

Some plant parasitic nematodes can be detected by direct examination of the affected tissue or by extracting the nematodes from the affected tissue. Many sick plants submitted to

the Plant Health Lab for diagnostics have been infected with nematodes. Examples of nematodes that attack plant foliage include *Ditylenchus*, which has been found in ornamental daffodil and dahlia bulbs, and *Aphelenchoides*, which has been diagnosed infecting ornamental nursery crops such as *Anemone* and *Helleborus*. These nematodes can be spread by propagating from infected plants. Testing for foliar nematodes takes 48- to 72-hours.

Timber intended for export overseas is tested for the pine wilt nematode, *Bursaphelenchus xylophilus*. This nematode is native to the US, although it is a dangerous invasive species in other countries. Because the nematode can move readily in logs and other large pieces of timber, many countries have adopted quarantines to protect their pines from this parasite. The Plant Health Section provides official inspections and testing of log exports for this nematode. Testing for *B. xylophilus* takes 48- to 72-hours.