



Nematodes: A sampling method for nematode monitoring

Viti-note Summary:

- Equipment
- Timing
- Method
- State government contacts for nematode testing laboratories

Nematodes, also known as eelworms, are mostly microscopic in size and have translucent, slender, wormlike bodies that taper toward the head and tail. They are hard to see with the naked eye, but can be extracted from the soil using specialised techniques. Plant-parasitic nematodes feed on plant roots and can decrease vine productivity. Therefore, it is important that nematode population pressure is assessed pre-planting, and also when management inadvertently promotes the lifecycle of nematodes, e.g. legume cover crops are ideal hosts for nematodes, whilst others can provide a biofumigant effect and deter nematodes.

The analysis of soil samples for nematodes has to be carried out in a specialist laboratory. The information below suggests general guidelines for collection of nematode samples.

SAMPLE SIZES OR SAMPLING METHODS FOR DIFFERENT LABORATORIES MIGHT VARY. CHECK WITH THE LABORATORY USED TO SEE IF THEY REQUEST A CERTAIN QUANTITY OF SOIL, OR SPECIFY A CERTAIN COLLECTION METHOD.

Equipment

Shovel, bucket, plastic bags, recording sheet and pen, labels or permanent felt tip marker pen.

Timing

Spring to winter when there is an active host present.

Method

1. Sample when soil is humid but not too damp, preferably after rain or irrigation.
2. A composite soil sample of 15-20 cores should be collected from about 0.5 hectare.

3. Discard the surface soil to minimise the influence of dried topsoil, weeds and cover crop.

4. Handling soil carefully, collect three soil and root samples from the middle vines in a panel at each sampling site:

- When sampling specifically for root-knot nematode, collect soil samples about 10 cm from the vine and sample to a depth of 30 cm;
- When sampling specifically for dagger and root lesion nematodes, collect soil samples about 10 cm from the vine to a depth of 60 cm (especially in the deeper sandy soils) in mid to late spring (October and November), when vine roots are actively growing. The increased depth of sampling compensates for the greater variation in vertical distribution of root lesion and dagger nematodes in the soil, and includes layers most populated by dagger nematodes. The best time to sample grapevine roots for root lesion nematodes is December. The wide range of soil depths allows differentiation between species occurring primarily on weeds or cover crops from those on vines. Taking two separate samples, one from shallower and one from deeper depths, could help to do this too. But more importantly, testing for root lesion nematodes in vines needs a root test as well as a soil test. Dagger Nematode is different.

Approximately 1 kg of soil is necessary from each site (the laboratory may request a smaller sub-sample from this bulk sample). Each sample must contain soil and/or feeder roots.

5. At each sampling point, alternate the side of the vine from which samples are collected.

Other topics in this Viti-Notes series include:

- *Nematodes in Australian vineyard soils*
- *Nematodes: A sampling method for nematode monitoring*

6. Place each sample in a separate labeled bag and seal.
7. Store bags in a refrigerator at about 4°C until they can be sent for testing. Samples need to be assessed within two weeks, however as soon as possible after collection is preferable.
8. Check with your State Government Department of Agriculture or Primary Industries for contact details of suitable laboratories in your state or region (some contacts are provided below).
9. Check with the specific laboratory to make sure sample(s) can legally be sent. If you are within a Phylloxera Risk Zone (PRZ) or Phylloxera Infested Zone (PIZ) then consult the National Phylloxera Management Protocol at www.phylloxera.com.au/ before sending samples.

State government contacts for nematode testing laboratories

New South Wales Agriculture

Wagga Wagga Agricultural Institute
Pine Gully Road
Wagga Wagga NSW 2650
t: 02 6938 1957

South Australian Research and Development Institute

Plant Research Centre
2b Hartley Grove
Urrbrae SA 5064
t: 08 8303 9400

Primary Industries Victoria

Crop Health Services
DPI Knoxfield
Private Bag 15
Ferntree Gully Business Centre Vic 3156
t: 03 9210 9356

Agriculture Western Australia

Agwest Plant Laboratories
3 Baron-Hay Court,
South Perth WA 6151
t: 08 9368 3721

Primary Industries and Fisheries Queensland

Grow Help Australia
80 Meiers Rd
Indooroopilly, 4068
t: 07 3896 9892

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Further information

Training

For regional specific training in pest and disease control, the AWRI is running Research to Practice: Integrated Pest Management for changing viticultural environments.

Contact

Marcel Essling: rtp@awri.com.au for more information.

Agrochemical information:

Agrochemicals registered for use in Australian Viticulture - updated annually.

Visit www.awri.com.au for the latest version.



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Useful references

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- Stirling, G., Nicol, J., Reay, F. 2002. Advisory services for nematode pests- Operational guidelines. Rural Industries Research and Development Corporation, Available at <https://rirdc.infoservices.com.au/downloads/99-041.pdf>
- For images of grapevine symptoms visit www.winetitles.com/diagnosis/index.asp.
- Product or service information is provided to inform the viticulture sector about available resources and should not be interpreted as an endorsement.