



## Mycorrhiza testing of truffle trees

*Courier or drop-in samples to:*

Alexis Guerin, Mycotree, C/-Southern Woods Nursery, 1002 Robinsons Road, Templeton, Christchurch New Zealand.

Please contact me if you have any questions: [guerin.myco@gmail.com](mailto:guerin.myco@gmail.com) | 027 434 0387

### Why should I test mycorrhizae<sup>1</sup> of my truffle trees?



*Mycorrhizae of the Black truffle in the field on Quercus robur (left) or on Q. ilex (right)*

1. It is doable and relatively affordable.
2. Microscopy (not DNA) can detect the level of development of truffle mycorrhizae which, in turn, indicates the fruiting potential.
3. There is no point spending time/efforts on tree management if the target truffle mycorrhizae cannot be found on the roots.

### How many trees should I sample?

It depends on the extent of information you wish to get and its statistical interpretation.

The more trees you sample, the better but 5% of trees sounds like a good compromise between a reasonable sample size (from a cost point of view) and valuable information.

A first sampling provides result trends which can be further tested/comforted via a more educated second testing round.

### About mycorrhiza testing at Mycotree:

Alexis Guerin-Laguette Ph.D. has over 25 years of experience in the cultivation of edible mycorrhizal fungi with strong academic publication track records ([www.mycotree.co.nz](http://www.mycotree.co.nz)).

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<sup>1</sup> The truffle/mushroom fungi colonize roots and transform them into **mycorrhizae** (from Greek, literally means 'fungus-root'), real root organs resulting from the intimate merger between plant and fungal tissues. A great nature story!

I identify truffle mycorrhizae at the species level using a combination of microscopy and, if required, DNA analysis (through a contractor with your prior approval).

For the Black truffle and the Burgundy truffle, DNA testing is totally unnecessary under New Zealand conditions. For a first testing of a Bianchetto plantation, DNA testing is necessary.

Microscopic observations of mycorrhizae are essential and more important than DNA analyses *only*. Our service focuses on the detection of mycorrhizae of your target truffle species, and an estimation of their abundance/development, which is the most important information for you.

If you wish (please see below), we could comment also on the presence of mycorrhizal fungi other than your target truffle species.

For accurate identification of non-truffle species, please contact me directly.

## **Cost:**

### ***Microscopy***

Target species, detection and abundance: \$30 per root sample (i. e. per tree sampled)

Target species, detection and abundance, with information on other mycorrhizal species present: \$50 per root sample (i. e. per tree sampled).

If you wish me to collect root samples for you, please count an additional charge of \$8 to 14 per tree (depending on how easy trees are to sample) and mileage expenses (\$0.79 per km).

*NB: I am a new business, so No GST applies.*

### ***DNA***

I would let you know if DNA testing were necessary to confirm target species. Cost TBA.

*Please see the root sampling protocol and examples of samples on the following pages (3 to 7).*

## Root sampling protocol

1. Dig the soil carefully with a hand hoe and fork (e. g. cuttlefish hoe) and look for roots by starting at the surface and slowly clearing away soil by hand (within 15 cm depth). You may start just outside the drip line of the tree (or at the edge of the brûlé if any). However, if no luck (especially under *Quercus ilex*), just try another patch, even close to the trunk since this may help finding the tree roots. Look for woody root pieces bearing fine roots (grass roots are thinner, usually less than 1 mm wide, whitish and usually close to the surface). Good pieces are 10-15 cm long, but not too thick say 1-5 mm in diameter. Make sure that the pieces collected bear fine roots where the mycorrhizas are. As required, repeat the operation on another side of the tree. Sampling from different sides will increase the chance to detect your target truffle species. You can mix roots from different sides (i. e. just one root sample per tree). **Please provide between five to ten root pieces (each 10-15 cm long) per sample (i. e. per tree).**
2. Collect root pieces carefully (by cutting one or both ends, as required), taking care to 'dig' the root piece out rather than 'pulling' it out to avoid tearing off mycorrhizae. Please do not wash the roots but leave attached soil on. Soil lumps attached to the roots may hold mycorrhizae, so it is better not to disrupt them. Wrap roots with attached soil in a moist white serviette or kitchen handy towel and put them in a compostable resealable bag. Please use only water (tap water is fine) to moisten the serviette.

**Please have a look at the attached photos (pages 4-5) to make sure you send a root sample of an appropriate size and bearing fine roots where the mycorrhizae are.**

***Quercus ilex* are great truffle hosts but can be difficult to root sample! Please see separate example of ilex root samples (pages 6-7).**

3. Record the sampled tree and write its name/coordinates with a permanent marker on the bag. Please also label the sampled tree or record its coordinates in the truffière.
4. Courier/drop the samples to: **Alexis Guerin, Mycotree, C/-Southern Woods Nursery, 1002 Robinsons Road, Templeton, Christchurch New Zealand.**

## Size of the root samples

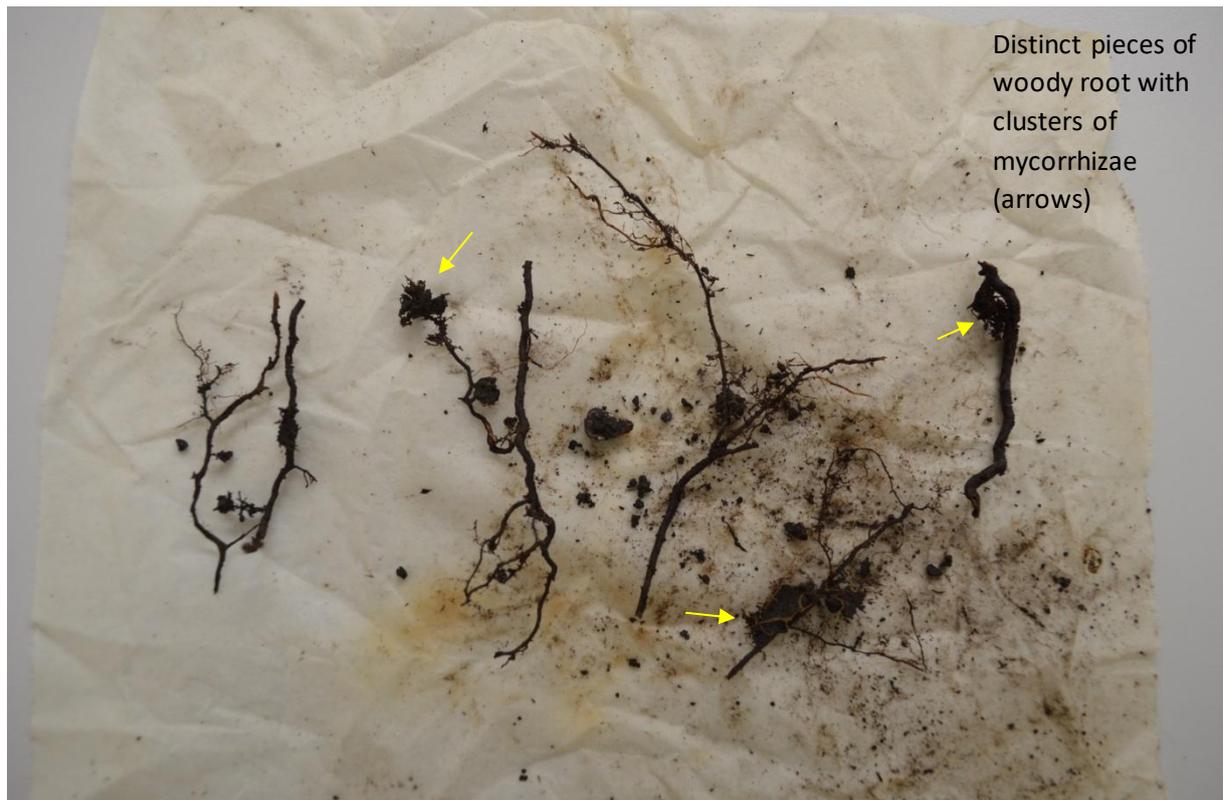
To avoid any size problems (some of the samples we receive are too small or do not bear enough fine roots to carry out analyses) we give here examples of appropriate sample sizes:



A similar one:



The sample below is smaller (10 cm-long pieces) but still appropriate given that several clusters of mycorrhizae are clearly present.



Finally see below more examples of good samples





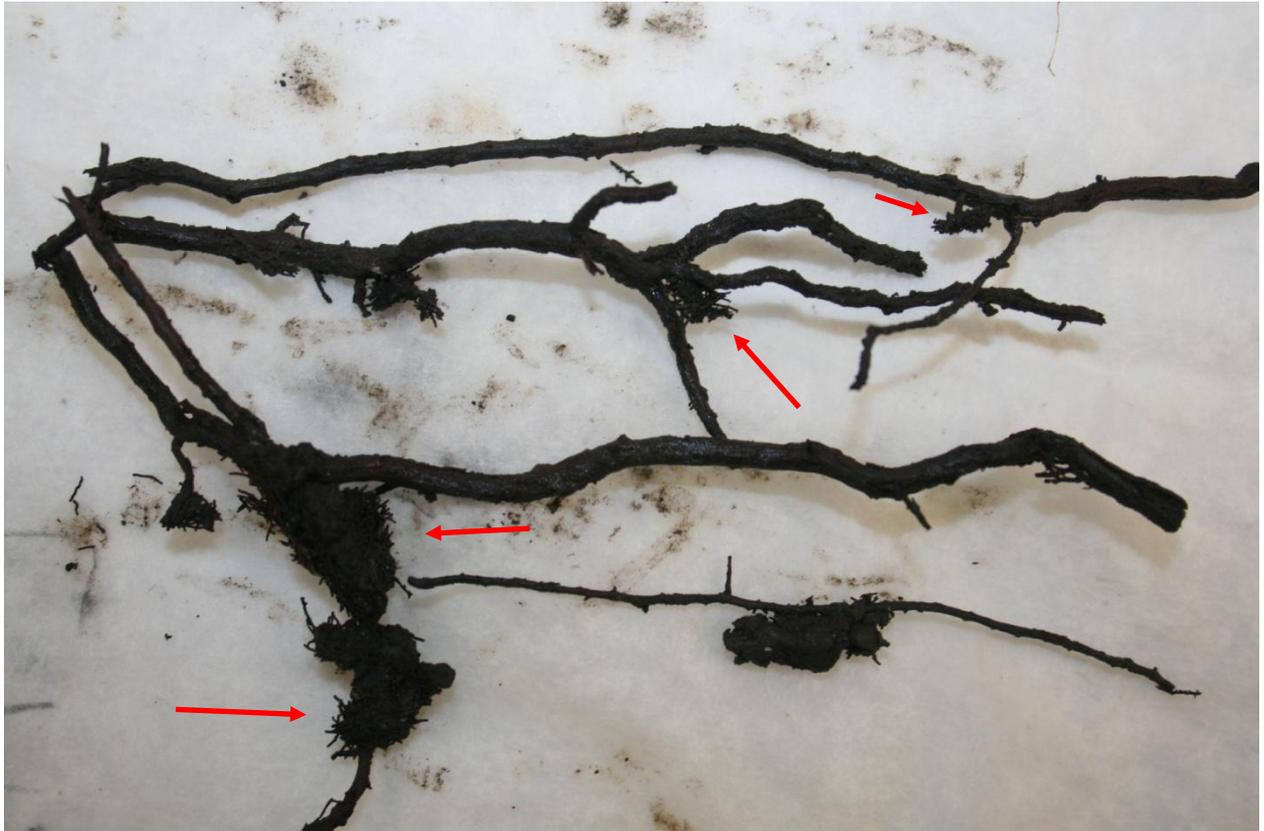
## Examples of root samples from *Quercus ilex*



This sample is not ideal but may be OK as there are mycorrhizae to look at. This is the absolute minimum I can work from.



Another ilex sample: still not the best sample but there are more lateral short roots attached. The truffle mycorrhizae we are looking for are potentially on these short lateral roots.



Another sample from ilex with large (several mm wide) clusters of mycorrhizal roots. You can see these aggregates are not just mere lumps of soil but rather soil adhering to short mycorrhizal root tips that you may see coming out of the root/soil aggregates (arrows). If you can find root pieces with such large mycorrhizal clusters attached, it is better than the samples shown above.