



Testing of truffle or mushroom seedlings

Courier or drop-in seedlings to:

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Please contact me if you have any questions: alexis@mycotree.co.nz | 027 434 0387

Why testing seedlings?

There is no point planting a seedling to establish a truffle or mushroom orchard if the seedling is not well-mycorrhized by the target species. Although a well-established initial mycorrhization alone cannot guarantee the harvest of truffles and mushrooms (other factors will come into play such as favorable environmental conditions and appropriate orchard management) it is an absolute prerequisite for success!

Mycotree offers the testing and certification of seedlings inoculated with the following “target” truffle or mushroom species:

- *Tuber melanosporum* (Périgord black truffle)
- *Tuber borchii* (Bianchetto truffle)
- *Tuber aestivum* syn. *T. uncinatum* (Summer truffle or Burgundy truffle)
- *Lactarius deliciosus* (Saffron milk cap)

Mycotree’s approach to testing is unique, but similar to that used by scientists who test the truffle seedlings of France’ biggest commercial truffle nurseries (AgriTruffe and Robin Pépinières) since 1973 (Andrés-Alpuente et al. 2014).

The testing methodology is not destructive and tested seedlings can be returned to you.

NZTA Seedling Quality Standard

Mycotree will test seedlings against the **Quality Standard commissioned by the New Zealand Truffle Association**, internationally peer-reviewed, and adopted by the NZTA in February 2022. Please contact the NZTA if you wish more information about it.

Methodology of mycorrhiza testing

The testing is based on a double-step microscopical analysis (dissecting and compound microscopes 7x to 400x) completed by DNA testing if required. The double-step microscopy is crucial to confirm the identity of the target species.

Under New Zealand nursery conditions, the identification of mycorrhizae of *T. melanosporum* and *T. aestivum* by morphology only, i.e., microscopy, is reliable, while

mycorrhizae of *T. borchii* must be DNA tested (preferably at the inoculum stage) in addition to microscopical analyses (Guerin-Laguette et al. 2013, 2021).

Microscopy can answer the question **presence/absence of target species** at 100% efficacy (assisted with DNA data for *T. borchii*). The **abundance of target mycorrhizae** is assessed based on their frequency of detection and on the presence of branched/young clusters of mycorrhizae. This assessment is made possible by the experience of the observer. Similarly, the presence and abundance of **non-target, non-truffle mycorrhizae** is also performed at 100% efficacy by microscopy (however identification to species level will require DNA analysis in most cases) and will also be assessed as per the standard. **Only microscopy analysis**, assisted by DNA as required, performed all over the seedlings' root systems can reliably assess these key components of seedlings certification.

Testing/sampling regime

Depending on the batch size, the standard specifies the sample size: number of randomly collected seedlings to be individually tested. Please refer to the sampling rate table page 10 of the Standard.

Mycotree can travel to sample seedlings. Non-biased sampling options, e.g., the buyer or his/her representative selects the test seedlings, are to be arranged if seedlings are couriered to Mycotree. Tested seedlings will be returned at the nursery's or the buyer's expenses.

Fees

Analysing a sample of seedlings is the most common and cost-effective way but analysing each seedling individually is also possible.

Sample of seedlings:

- \$32 excl. GST per tested seedling, i.e., analysed under two complementary microscopes. This fee applies independently from the outcome of the testing.
- Disbursements: mileage or other travel related expenses, if required.

Individual testing of all seedlings (depending on the results from a sample of seedlings, this could be the only option to certify seedlings):

This can be arranged @ \$200/h excl. GST providing it is logistically possible. It is best if seedlings' handling assistance is available.

Prices exclude DNA testing (\$105 excl. GST per mycorrhiza sample), if required, and disbursements, e.g., mileage, shipping fee to return seedlings etc.

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Results

- **If the seedlings pass the test, a numbered Certificate will be issued at no extra charge.** Concised testing results can also be obtained at the client's request.

Mycotree's batch certificate includes tree/truffle species information, date inoculated and size. It implies that the nursery and their customers acknowledge that the results are based on a sample of seedlings randomly collected from that batch. **The certificate issued by the controller for each batch tested corresponds strictly to the number of plants contained in the said batch.**

Note:

I understand that the NZTA is in the process of rolling out a Trademark certification called "TRUFSURE" along with labels for certified seedlings.

- **If the seedlings fail the test, a full seedling testing report could be issued at the client's request at an extra charge:** Depending on the results' complexity (I would give you an indication), 1-3h could be required, @ \$200/h excl. GST.

The report will include:

- Highlights: Presence and abundance of target and/or non-target species and their development for each tested seedling. Estimated percentage of seedlings per batch deemed suitable to establish a truffle plantation, if any.
- Implications of the testing results & Conclusions for each batch tested with recommendations to solve issues in the future and, if applicable, as to what further testing could be done on the submitted batch to potentially identify seedlings appropriate for planting.

References

- Andrés-Alpuente A, Sánchez S, Martín M, Aguirre AJ, Barriuso JJ. 2014. Comparative analysis of different methods for evaluating quality of *Quercus ilex* seedlings inoculated with *Tuber melanosporum*. *Mycorrhiza*, 24 (Suppl 1), S29–S37.
<https://doi.org/10.1007/s00572-014-0563-x>
- Guerin-Laguette A. 2021. The sustainable cultivation of edible mycorrhizal fungi - furthering the dream. *Mycoscience* 62, 10–28. <https://doi.org/10.47371/mycosci.2020.11.007> Free to download from:
https://www.jstage.jst.go.jp/article/mycosci/62/1/62_MYC520/article
- Guerin-Laguette A, Cummings N, Hesom-Williams N, Butler R, Wang Y. 2013. Mycorrhiza analyses in New Zealand truffières reveal frequent but variable persistence of *Tuber melanosporum* in co-existence with other truffle species. *Mycorrhiza*, 23, 87–98.
<https://doi.org/10.1007/s00572-012-0450-2>