**Truffle tree buyers guide**

The successful cultivation of truffles requires planting tree seedlings whose root system is well-colonized (or well ‘mycorrhized’) by the desired truffle species.

Indeed, the truffle mycelium merge with the root tissue forming mycorrhizae (from Greek, ‘fungus-root’), real root organs. Truffle mycorrhizal roots will form ‘permanent homes’ of your truffle, called ‘brûlés’. Mycorrhizae also help the tree to grow. Starting your plantation with trees having well-established mycorrhizae of your desired truffle species is essential to the success of your planting. Of course, other important factors will be at play: successful planting, appropriate soil and climate, appropriate tree management etc. However, if there are no truffle mycorrhizae, or very small amount (i.e. barely detectable) on the trees you bought for establishing a plantation, you simply waste money and time!

**What do I need to consider before purchasing truffle tree seedlings?**

**The plant part**

It is important to make sure that the seedlings have no major defaults that would jeopardize their growth in the field, e.g. root bound. Most nurserymen would be experienced and we recommend that you discuss with them how they guarantee that seedlings have been raised to best standards.

**The truffle part or mycorrhizae**

This is by far the most important part of the tree you should know.

1, Do the truffle seedlings have the desired truffle mycorrhizae?

2, How good are they regarding their truffle mycorrhizal development?

3, Are there any un-wanting fungi (contaminants) on the seedlings? How much?

4, Who can give you the answers to the above questions?

**The truffle tree quality control (testing) will give you answers to the above questions.**

The mycorrhiza testing of truffle-inoculated seedlings is a complex task, requiring

1, Highly specific skills (i.e. qualified experts)

2, A range of efficient scientific equipment: dissecting and compound microscopy (up to x400 magnification) and, in some cases, DNA technologies.

**How does the tree testing answer these questions?**

It depends on how much money customers want to spend on the tree testing. The more detailed the test (which is desirable), the more the tree would cost.

1, Take truffle tree samples for the testing, normally 2-5% of the seedlings in each tree production batch.

2, Examine the tree samples in the lab (methodology can vary but answers to questions 1 to 3 must be provided in a sound and realistic manner).

3, Testing results will be issued and trees that are suitable for establishing a truffle plantation will be certified.

**Who can do the truffle tree testing?**

The testing relies on “well-trained analysts”. For example in France, truffle tree certification is run by specialist staff from research organizations (e.g. INRA for Agri-truffe and Robin nurseries, CTIFL for smaller nurseries).

In New Zealand, Plant & Food Research mycorrhiza scientists have a long and extensive experience in mycorrhiza synthesis and analysis, both on nursery seedlings and in the field. Their work is widely respected and has been published in several peer-reviewed international journals. There are also companies providing DNA testing services. Microscopy analyses are paramount as they provide overall information on the mycorrhizal status of truffle seedlings. In New Zealand conditions, *Tuber borchii*, *T. brumale* and several other species forming ‘spiky *Tuber* mycorrhizae’ (Guerin-Laguette et al 2013) can only be identified by DNA. However, there is no point running DNA analyses without prior microscopy observations.

PFR also inform their customers on how they perform the testing and assist them to understand the results and their meaning from a practical point of view.

**References:**

Guerin-Laguette A, Wang Y. In defence of truffles. 2015. TreeCropper (New Zealand Tree Crops Association’s journal) 82:10-13.

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.