

# Home Cultivator



# Don't have the land or climate for truffle trees? Try growing at home ... in containers!

**Y**ou don't have to go to Europe to enjoy wild truffles, we have our own native species right here in North America. At the same time, European black Périgord truffles are now being successfully cultivated in North America in the South, California, and some other places. But what if you don't live in one of these conducive climates or don't have the space for a truffière? You just might be able to grow truffle trees in containers at your home. (Why not? Many of us grow tropical trees and other plants, so if you have a decently green thumb, it might be worth a shot!)

Your first question is where to find inoculated truffle tree seedlings. Believe it or not, there are many purveyors online offering guaranteed inoculated tree seedlings. Most truffle trees are of two European oak species, *Quercus ilex* and *Q. pubescens*, as well as European hazelnut, *Corylus avellana*.

The conditions under which truffle trees can produce truffles have been studied extensively over the past several decades (and are briefly discussed in the previous article). As with any other farming endeavor, there are many concerns for the truffle farmer, including weeds (plants as well as competing fungal weeds), natural predators, climate, soil conditions, etc.—these can be dealt with easily when growing in containers. The ideal pH of the soil for growing truffles is pretty high, above 7.9 so to prepare an outdoor site, the grower may have to amend with several tons of lime per acre; for container cultivation the same treatment may be needed,

though is much simpler of course. Likewise, maintaining soil moisture is much easier with trees grown in containers, but in some cases frequent watering may be necessary.

## **Climatic conditions, temperature, pH, and sunlight**

Maintaining the trees in containers is the easy part. But will they produce truffles? That is, of course, the real trick. Duplicating the climatic conditions in the truffle growing regions of France, Italy, and Spain may ensure the potted trees thrive ... but the fungi have the final say. Even with the millions of dollars that have been spent over the past decades to investigate growing truffles on inoculated trees, it is still not known what specifically causes these mycorrhizal mushrooms to fruit. However, it is known that the climatic conditions need to be similar to the natural truffle growing regions of the Mediterranean. That is, warm dry summers with periodic moisture to start the developing truffles, heat and a little moisture to grow the truffles in the fall, and mild winters. Winters can be chilly but not so cold that the ground freezes, injuring the ripe truffles from late fall through the winter. Depending where you live, you may have to move your potted trees around to replicate this sort of climate.

In a truffière you have to make sure to plant the trees in a staggered

arrangement to take advantage of the daily trajectory of the sun so each tree doesn't shade the roots of those nearest them. The trees also are pruned into an inverted pyramid or cone shape with the point downward to allow the sunlight to warm the roots. Not a problem if cultivating in containers. With containers you can move the trees wherever the season's conditions might be best in all the little microclimates of your growing area. If the roots need extra warmth, the containers can be placed so they can receive the direct sun on the outside edge of the shadeline of another larger tree, while the tops are under the shade and protected from too much transpiration. Placing them under trees that have been pruned with a high umbrella canopy provides more bright shade than having the branches of the truffle tree intertwining and competing with low branches of the shade tree. Plus the soil in potted plant containers will warm up (and cool down) more quickly than the ground where you live—again, things to consider.

For field-grown as well as containerized trees, you need to provide well-drained loamy soil with good body (also discussed in the previous article). It is usually recommended to have 5–8% organic matter but for containers 10–15% is recommended. Crushed and powdered oyster shells are used to provide soil drainage and keep the pH high; it needs to retain moisture through the mass of soil but be well drained so water doesn't sit and make any anaerobic conditions. Also, if it stays too moist



it won't be as much to the liking of the truffles as to competitors. Adding some tiny aquarium gravel, coarser than builder's sand but smaller than pea gravel also provides good drainage. **If you use commercial potting soil or amendments, make sure you don't use the ones that include mycorrhizal fungal spores on the label as they would compete with the truffles.** (Yes, you could sterilize the soil mix, but unless you have a giant commercial autoclave, doing it in batches in your oven will be quite laborious.)

Besides adequate protection from the wind, extremes of hot or cold temperatures, and regular watering, truffles need a highly alkaline soil pH, usually between 7.5 and 8.3. This is usually higher than most trees would prefer, so they may be under stress. What you are striving for is a pH producing a balance between what the truffle likes and what the tree can tolerate. The tree's tolerance can be adjusted with a few tricks more easily than trying to mess with what the truffle likes. Since the idea is to provide the truffle with its favorite conditions to enable it to out compete other mycorrhizal fungi at its favorite pH of 7.9 (and most trees prefer a lower pH), one trick you can do to help the tree is to foliar feed it with a liquid tea of nutrients that it can absorb through its leaves. Many people believe that the high alkalinity preferred by the truffle ties up the availability of nutrients for the tree roots. One of the specific nutrients that can't be accessed in a high pH environment is iron, and occasionally truffle trees show signs of other nutrient deficiencies like magnesium and boron. The telltale sign that your tree needs additional iron is a yellowing of the leaves and a burning of the edges of the leaves. Regular foliar feeding with fish emulsion and liquid seaweed will allow the tree to absorb whatever nutrients it isn't getting from the roots. The tea that is sprayed or sprinkled on the leaves one to four times per month can be one to three tablespoons each of fish emulsion and liquid seaweed per gallon of water and it shouldn't burn the leaves at that concentration.

It is much easier to control the pH in a limited container than an open limed field or even a limestone

outcropping. There are several sources for getting powdered lime, including quarry sourced crushed limestone and crushed oyster shells (mentioned above as a soil amendment to promote good drainage). Don't use quicklime. Generally, powdered and crushed oyster shell, which can get expensive, is more efficiently and effectively applied in a container than in a field. There also are commercial liquid alkaline solutions that you can buy for keeping the pH up and they too are more efficiently and effectively applied in containers.

Got pests? All plants get them and with container grown plants you can pick them off by hand and no need to use any sorts of sprays. And it should go without saying: never use fungicides on trees inoculated with truffle fungi.

## Final things to consider

One thing to remember about standard truffle trees is that they can grow to more than ten feet tall before they are expected to produce truffles. In order to accommodate this growth you need to be thinking about the size of the planter in which you are growing the tree. If you grow your trees in a

half wine barrel, it can be quite hefty to move around. A heavy-duty dolly with a long platform helps greatly and keeping each container on its own pallet also helps. Alternatively, you can try keeping the trees under control by pruning. And if you are growing the trees in containers you can use bonsai and aesthetic pruning techniques to disguise the true nature of your truffle trees. Just remember not to use the bonsai techniques on the roots—prune foliage only.

It's possible to use a purchased commercially inoculated tree to inoculate additional seedlings that are co-planted in the same container; planting acorns etc. within the container would, presumably, better your chances at inoculation and replicate the process that normally occurs in nature. Though it's widely thought that truffles can be grown only on the species listed above, those are just the most commonly cultivated hosts for the truffle. Truffles can grow on a range of hardwoods that deserve more scrutiny for cultivation.

*Editor's Note: Much of this article was written by Ken Litchfield and originally appeared in FUNGI way back in our first year. His trees continue to thrive but if he's picking truffles from them, he's yet to share any with the staff of FUNGI. ↑*

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