

## PLANT TUBER AESTIVUM Vitt / Var Uncinatum

### Foreword:

The difference between *tuber Aestivum* and *tuber Uncinatum* is primarily geographic. A tree mycorrhizal with this kind of truffle, planted in a dry, Mediterranean or even oceanic climate, will give truffles in summer, then we talk about *Tuber Aestivum*.

If the tree is planted in a cooler region, more humid, with a continental climate or temperate continental, rather truffles arrive in autumn, we then speak of *Tuber Uncinatum*.

### Introduction:

The truffle is a fungus underground fruiting associated with a host tree, whose cultivation is possible in different climates: oceanic, degraded oceanic, especially semi-continental and continental, a draining soil, more or less rich in limestone and biologically active. The following recommendations should help to promote the success of truffle plantations.

The maximum climate risk is alternating frost and dry weather (uncommon).

## A / THE GROUND'S CHOICE

There must be a diagnosis before planting and possible corrections.

### Determine the presence of limestone:

A soil test by a specialist laboratory is always recommended.

For limestone, it is possible to verify its presence on the ground by pouring a few drops of hydrochloric acid diluted to 10% and then to observe the excitement occasioned: For *tuber Aestivum / Uncinatum* that does not need a high lime content, the excitement can be moderate.

The truffle is an underground mushroom, it will take a ventilated ground and draining. Favourable soils *Tuber Aestivum* and *Uncinatum* be alkaline or Sub alkaline, with presence of exchangeable calcium, balanced texture (beware of excess clay!), lumpy structure, well-drained, mineral composition having neither deficiency or excess major elements and trace elements.

Chemically, the analysis will determine:

- the pH (great if above or equal to 7),
- its CaO content (exchangeable calcium of from 4 to 16%),
- organic matter content (up to 20% or more) and the manner in which it is advanced into the ground (C / N up to 20% or more),
- its mineral content: medium fertility without deficiency or excess.
- clay content can be high (up to 40% or more).

The laboratory technician will board the interpretation of the analysis: It is him who will give guidelines on possible corrections and to advise whether to plant. You shall ask to AGRI-TRUFFE technicians there advise as well. Our visit on your fields will give us an idea, added to the analysis, of what corrections to do.

All the collected data should help to conclude if the land is or is not favourable for truffle production.

Finally, note that soil biological life is important: it is reassuring to detect the presence of galleries, insect larvae and ants ...

### *Diagnose the environment of the plot:*

Favourable presence of trees producing around the area where you plan to plant (presence of hornbeams, hazel, oak, beech).

The indicator flora is also important: wild service tree, hawthorn, Honeysuckle broom, clematis, dogwood, wild rose, field maple, charcoal, juniper, blackthorn, privet, former viburnum, Brachypodium woods, Brachypodium pinnate erected bromine, sheep fescue ...

Optimal Topography: uplands and slopes, all favourable exposures, preferably Southeast, North, Northeast, East.

### *Determine the cultural history:*

Vines, cereals, orchards and meadows are favourable. Avoid recent deforestation, because there are risks of competition with other ectomycorrhizal fungi.

## **B / LAND PREPARATION**

Get a breeding ground for the fungus and the tree by making the necessary corrections without upsetting the structural layers of the soil.

### *Soil preparation*

Preparation technique vary:

- Depending on the ground: in topsoil (rendzina type or lithosol), not ploughing, but prefer either a digging with cultivator, manual or mechanical to make holes for plantation on a grassy or weedy soil.
- According to the previous crop: prepare the location with a manual tool (50 \* 50 cm) where the tree will be planted.

### *Possible plantation from preparation*

- Old cultures (vineyards, cereals, orchards, forage crops): ploughing crossed with plough and disc coulters or passing tooth tool (harrow or cultivator) to crumble the soil if necessary.
- Pasture, grazing, grass: decompacting soil by subsoiling and ploughing and removal of the grass cover mechanically (ploughing, disc passage, farmer).

Soil preparation can be located at the locations where the plants will be installed (worked narrow strips or squares of 1/4m<sup>2</sup> on each plant location).

### *Plantation after a preparatory culture of 3/5 years minimum (cereals, sainfoin, alfalfa)*

Wood and woody fallow: grubbing, evacuation, subsoiling, cross shallow tillage with disc plough and / or passage of a cultivator, root removal.

### *Planning*

- Restore ditches draining existing next to the area
- Provide proximity of a water source

### *Correction*

Correct the soil pH (if necessary): add crushed limestone alone or dolomite if the soil is deficient in magnesium; if C / N <9, add organic matter rich in carbon or grass seedlings.

## C / CHOICE OF TRUFFLE PLANT

### Main species

The right choice of plant species is important. The rule is to plant what naturally thrives best in your particular habitat (biotop).

SPECIES	DESCRIPTION	ADVANTAGES	DISADVANTAGES
<b>Holm oak</b> ( <i>Tuber aestivum</i> for only)	<ul style="list-style-type: none"> <li>- leathery foliage and persistent</li> <li>- no dormant in winter</li> <li>- Mediterranean Gas</li> </ul>	<ul style="list-style-type: none"> <li>- well adapted to drought</li> <li>- Easy maintenance (no phytosanitary problems)</li> <li>- slow and steady growth - early production,</li> <li>- aesthetic as it remains green all year</li> <li>- Game does not like its prickly leaves</li> </ul>	<ul style="list-style-type: none"> <li>- sensitive to frost in high humidity situation rivers near or shallows</li> <li>- avoid planting in frost sensitive period</li> <li>- the sustainability of its production is less fertile ground pushing</li> </ul>
<b>downy oak</b>	<ul style="list-style-type: none"> <li>- commonly known as "white oak"</li> <li>- it is the quintessential truffle tree</li> <li>- its foliage remains present in winter, brown</li> <li>- hair system under the leaves</li> </ul>	<ul style="list-style-type: none"> <li>- Southwest shaft and altitude</li> <li>- production of longevity</li> <li>- hardy tree and dormant during winter.</li> </ul>	<ul style="list-style-type: none"> <li>- into production slower than the holm oak (about 8 to 10 years)</li> <li>- susceptible to powdery mildew and pests</li> </ul>
<b>Hazel</b>	<ul style="list-style-type: none"> <li>- common</li> <li>- origin of the seeds: variety Négret berry</li> </ul>	<ul style="list-style-type: none"> <li>- rapid growth</li> <li>- early production (around 4 years)</li> <li>- dormant in winter; it does not like frost</li> <li>- control of mycorrhizal easy because with abundant and superficial root hairs</li> </ul>	<ul style="list-style-type: none"> <li>- his hairy root system easily trap unwanted fungus</li> <li>- slightly rustic, it prefers fresh and deep land</li> <li>- rapid growth which closes mid faster - low production sustainability</li> <li>- expensive labor (size suckers, parasitism)</li> <li>- the presence of hazelnuts attracts rodents!</li> <li>- feared the excesses of limestone (chlorosis)</li> </ul>
<b>Hornbeam</b>	<ul style="list-style-type: none"> <li>- Common (betulus)</li> <li>- deciduous</li> <li>- intermediate behavior between oak and hazel</li> </ul>	<p>Benefits such as oak:</p> <ul style="list-style-type: none"> <li>- Rustic (taproot)</li> <li>- dormant in winter</li> <li>- no suckers</li> <li>- sustainably produced</li> </ul> <p>As hazel:</p> <ul style="list-style-type: none"> <li>- hairy tracing (early production)</li> <li>- used as a hedge (hornbeam)</li> </ul>	<p>Disadvantages hazel:</p> <ul style="list-style-type: none"> <li>- fresher courses</li> <li>- chlorosis excess limestone</li> <li>- Rapid growth in ground pushing (middle closure)</li> </ul>
<b>Austrian Pine</b>	continental Ecology	Tolerates cold winters and hot summers. Resistant limestone Protects truffles during droughts.	easily trap unwanted fungus

### The truffle plants

AGRI-TRUFFE offers trees 1 or 2 years old, mycorrhizal and certified INRA (National Institute of Agronomic Research).

Ensure storage of the plants in a cool and ventilated place before planting.

Making the choice of the combination may be wise: longevity of oak, hornbeam has stability and earliness of hazel, for example.

## **D / PLANT WITH CAUTION**

Careful plantation, at the right time, is key to success. Improper planting will delay the start of production and may result in losses of plants the first year; Quality of planting depend all the future life of tree.

### **Density**

800 to 1000 plants / hectare. At least 4 meters between the lines, maximum 5.

For example, 1000 trees, a tree every 2 meters, 5 meters between the lines, with East / West direction if possible, for uniform sunshine and shading.

For *Tuber Aestivum* and *Uncinatum*, the shadow is important, that is why plantation density is higher than *Tuber Melanosporum*.

It is therefore necessary that the vegetation is clear enough to let the rays of the sun needed to warming spring soil, but at the same time, dense enough to prevent them from drying out the soil.

### **Staking:**

Drawing the chalk line and staking ground with tutors who will then be used for holding nets for protection against rodents. Put a stent 1 metre tall at least 10 cm from plant collar, 6 to 10 cm in diameter if wood is used; prefer for convenience a reinforcing bar of 6 mm in diameter.

### **Receiving plants and preparation of planting holes:**

- ***Reception plants:***
  - Upon receipt, out of their transport packaging by leaving them in their buckets;
  - Store them in a dry, ventilated area away from frost and light in the case of oak trees.
- ***Preparation of seedlings:***

To facilitate the removal of the growing pots, it is important to moisten the root ball or water the plants or completely immerse the buckets for several minutes.

- ***Planting :***
  - prepare cubic holes of 25 to 30 cm
  - squeeze the whole pot and mound by hand so that the substrate does not dissociate from the root system
  - open the jar unhooking the top downwards to release the sod
  - take the sod carefully and position it in the hole
  - fill the hole with fine soil around the sod till the top. Press well with both hands and finish filling the hole.

**Warning! Do not add compost or peat because they are acidic materials**

- Water (3-5 litres / plant according to your soil type) except during frost when watering will differ until spring. This eliminates air pockets and therefore promotes recovery
- Gently, put some more soil on the plants' feet, and create a bowl a few centimetres deep to hold rainwater about 15cm from the plant.
- Mulching, with black plastic, or with natural fibres (jute, for example) (avoid grass and hay that attract mice and has often been treated with undesirable fungicides) can then be installed to maintain a clean soil around the plant during the first years
- Place a stake 1 metre tall at least 10 cm from the plant, 6 to 10 cm in diameter if it is of wood; or a reinforced steel bar of 6 mm in diameter
- Place a safety net or a mini-greenhouse (Tubex).

\*\*\*\*\*