



DOSSIER ON DESERT TRUFFLE

www.thaderbiotechnology.com

Info@thaderbiotechnology.com

+34 607 44 87 65

We thank the interest in this biotechnological project that began more than 25 years in the Group of Mycology-Micorrizas of University of Murcia (UMU) and growing daily. The implementation of desert truffle plantations offers the possibility of revaluing the use of non-arable soils from semiarid areas, as well as its compatibility with other upland crops (almonds, olives, etc ...).

Desert truffles are edible Ascomycetes hypogeous fungi. They are symbiotically associated with plants of the genus *Helianthemum*, also called "jarillas". We are pioneers worldwide in the production of mycorrhizal plant with species of desert truffles: *Terfezia spp*, *Picoa spp* and *Tirmania spp*.

Since 1999 we have made numerous plantations on the Iberian Peninsula, Canary Islands and countries like Argentina and Israel. Our plants start producing truffle desert last only two years, reaching an average yields between 350 and 400 kg/Ha.



Desert truffles

Desert truffles from *Terfezia*, *Picoa* and *Tirmania* genera present fruiting bodies of different sizes and shapes that are edible and highly appreciated because of its flavor and texture. They are commonly used in stews, grilled dishes, but also consumed fresh. They have excellent nutritional qualities due to its high fiber content, protein, minerals, essential amino acids and antioxidants.



The plantation

There are two optimal plantation periods: From February to May, and from September to November. Summer months should be avoided in order to ensure a proper establishment of the crop. Regarding soil properties, the optimal conditions for desert truffle cultivation are described in Table 1, but in general, any alkaline, calcareous and relatively poor soil will be suitable.

The prevailing idea about the design of any desert truffle plantation is the soil early colonization by mycorrhizal roots. The fastest the truffle fungus is established strongly, the sooner the critical mass needed to trigger fruiting will be reached. For the plant aerial part, the goal is the rapid development of the shrub to displace weeds competing for water and nutrients. Therefore, an essential factor in designing a planting is the density and volume of plant.

The framework design and planting depends on various factors such as size of the plantation, irrigation system, orientation ... varying the density from 6-10 plants/10 m² (Figure 1).

Table 1. Summary of physico-chemical analysis of soils reference

| PHYSICO-CHEMICAL ANALYSIS | |
|---------------------------|-------------|
| pH (in water 1:2,5) | 6.8-8.7 |
| C.E. 1:5 (μS/cm) | 123.1-302 |
| Sodium (meq/100 g) | 0.15-1.20 |
| Potassium (meq/100 g) | 0.28-1.5 |
| Calcium (meq/100 g) | 4.94-23.38 |
| Magnesium (meq/100 g) | 0.95-3.7 |
| Organic Mater (%) | 0.58-3.92 |
| Organic Carbon (%) | 0.34-2.28 |
| Nitrogen (%) | 0.058-0.267 |
| C/N ratio | 2.8-10.15 |
| Carbonates (%) | 5.1-80.1 |
| Limestone (%) | 3.4-24.76 |
| Phosphorus (ppm) | 7.52-66.4 |
| Clorures (meq/100 g) | 0.05-0.09 |
| Sulfates (meq/100 g) | 0.01-0.32 |
| Iron (ppm) | 1.79-79.5 |
| Cooper (ppm) | 0.31-2.73 |
| Manganese (ppm) | 3.03-57.12 |
| Zinc (ppm) | 0.3-3.12 |

Prior to the establishment of the mycorrhizal plant, a soft and superficial tillage of the soil where the plant will be established is recommended (no more than 20-30 cm deep in the soil).

For planting, pits 15-20 cm deep will be made. We discourage the use of herbicides and fungicides pre and post emergency. Instead, we propose mechanical removal of the herbs with trimmer. This system does not eliminate the root weeds and therefore does not alter the soil structure once the desert truffle plant has been established.

Planting irrigation will be between 4 and 6 liters per plant. These irrigations will be performed weekly for the first month (4 Irrigation/month) and monthly until the first summer. Once the desert truffle plant is established, after the first year of irrigation, we eliminate the irrigation of the breeding program. No irrigation during summer months is needed. *Helianthemum* species are summer deciduous plants and they must lose their leaves during summer to complete its natural cycle.

Managing a desert truffle plantation is not expensive in terms of labor refers; It requires no regular or occasional applications of fertilizers and/or pesticides. To date there have been no reported pest/disease, directly attacking the aerial and/or underground part of the mycorrhizal plant. You can contemplate putting up a perimeter fence, in case there may be problems with potential cinegenetic species.

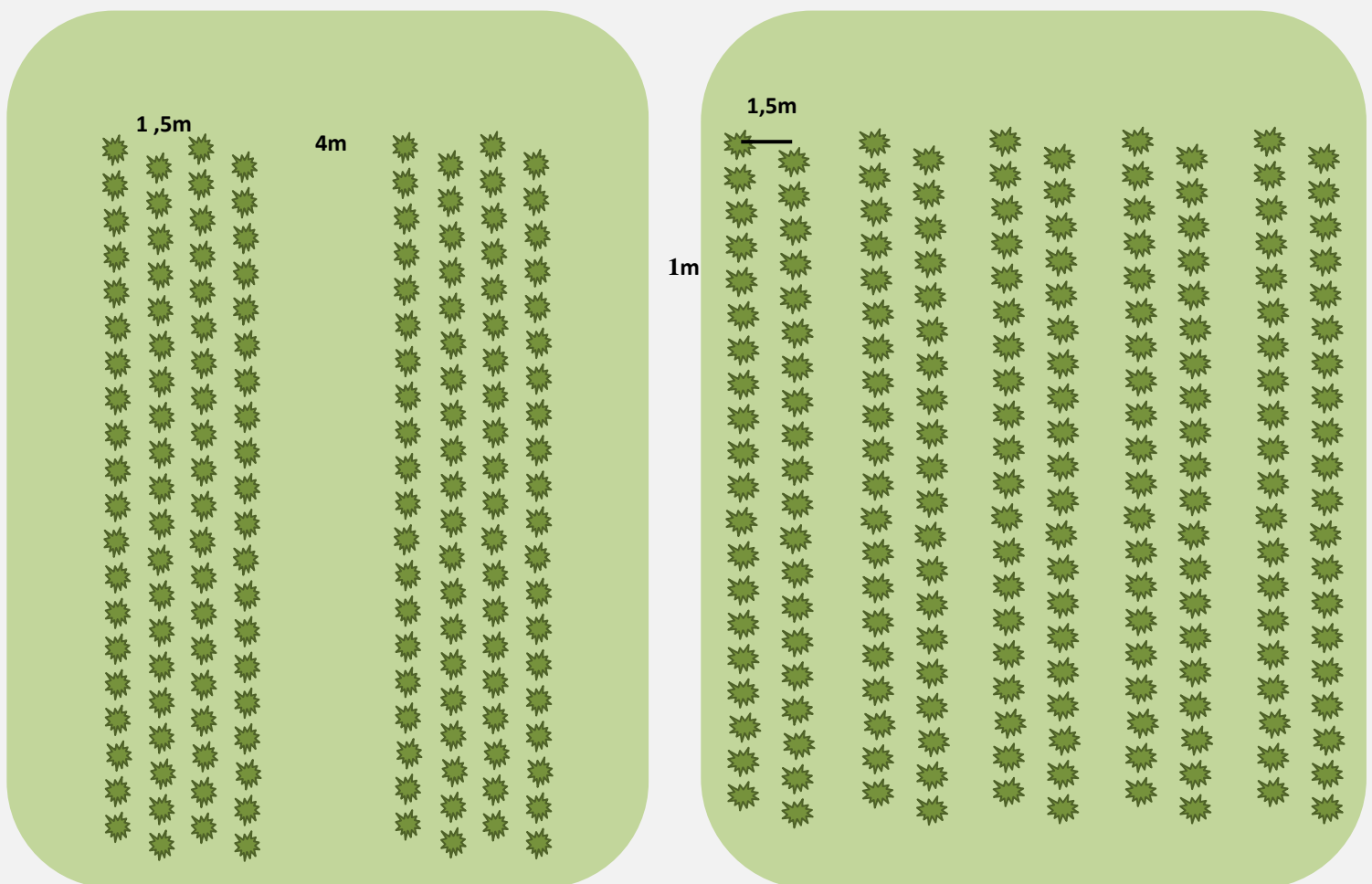


Figure 1. Two proposals of desert truffle plantation framework.

We have managed, through irrigation in specific times of the year, to increase the likelihood of fruiting in the second year of planting and to correct the production year fluctuations. Irrigation is an optional factor for this type of crop, but once you decide to opt for its use is extremely necessary to control the timing and amount applied as an excess of water lead to displacement of desert truffle species by other fungi. For stable productions, annual contributions of 250-400 L / m² including natural rainfalls are recommended. In order to stabilize the production, irrigation supply in autumn and spring are of special importance in those years when the natural rainfalls are not sufficient.

Desert truffles emerge and form a mound and a cracking in the soil, announcing its presence. Once extracted the fruit body, the hole formed by the truffle should be filled with more soil to maintain the soil structure. The fructification period ranges from December to May, depending on the climatological conditions and the plantation location.

For more information about fares and consulting services please contact us at **www.thaderbiotechnology.com**, via email at **info@thaderbiotechnology.com** or via telephone at **+34 607 44 87 65**.