



PINEA SPOT CONGRESS

LISBON 2023

21 TO 23 NOVEMBER



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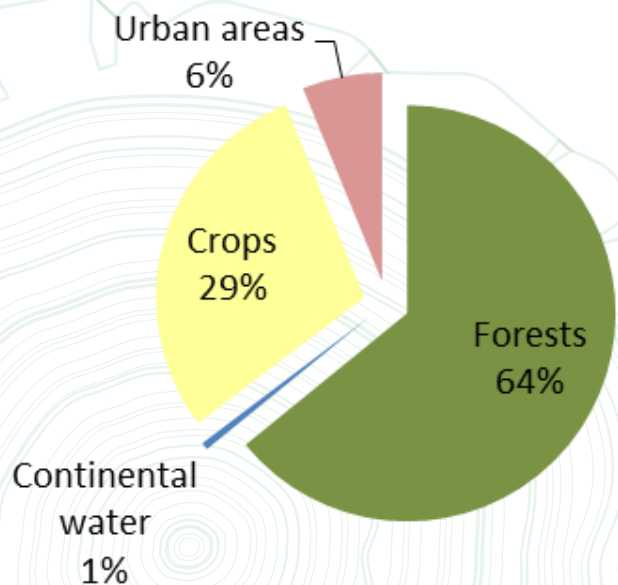
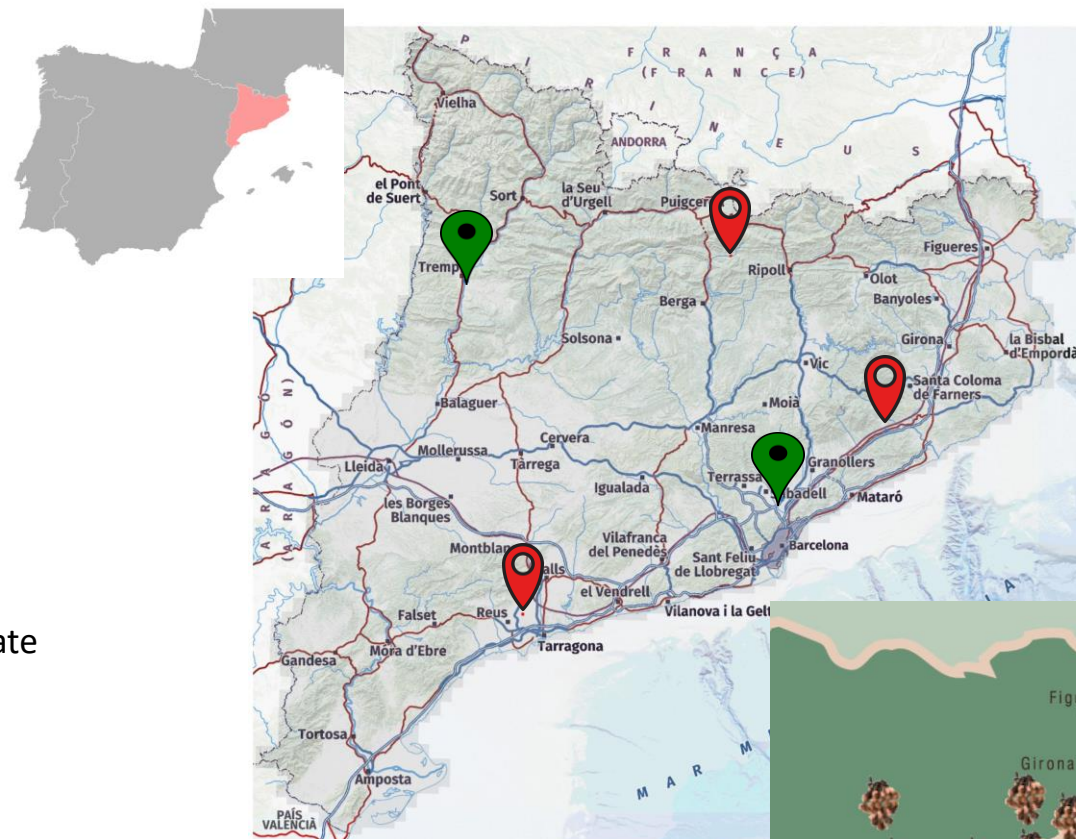
FORESTAL CATALANA'S PINE GRAFTING PROGRAM IN CATALONIA. PRODUCTION OF GRAFTED PLANT IN NURSERY.

Lisbon, November 21
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Ministry of Climate Action, Food and
Rural Agenda, Spain
Forestal Catalana



Forestal Catalana, Catalonia

- **Forestal Catalana** is a public company attached to the Ministry of Climate Action, Food and Rural Agenda of **Catalonia**. Among them actions there are some related to the natural environment, biodiversity and forests.



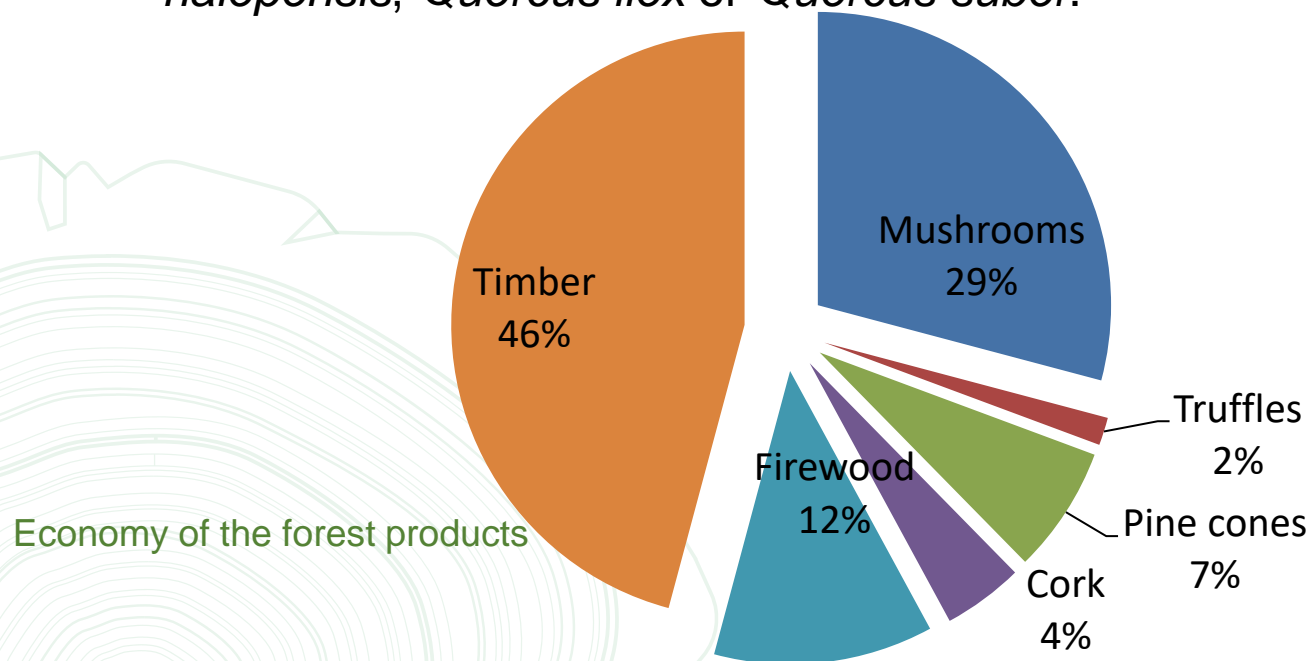
- 40% wooded- 1.348.000 ha
- 75% of the forest surface is private (around 200.000 forest owners)

- In recent years we have specialized in applied research and obtaining new products more attractive and valuable for the sector. One of the products with which a lot of work is being done, and which has the most added value, is the **grafted stone pine** for pinecone production.



The stone pine in Catalonia

- The stone pine natural forests constitute a very typical landscape in the Mediterranean area. In Catalonia it occupies an area of 36,000 hectares, often mixed with other species such as *Pinus halepensis*, *Quercus ilex* or *Quercus suber*.



- It is the pine nut that is why this tree is known. This edible seed is an irreplaceable ingredient “panellets”, that are very typical in Catalonia. Due to its high dietary value, excellent flavor and cultural connotations associated with the Mediterranean diet, it is one of the most emblematic non-timber forest products of the Mediterranean forests.

The stone pine in Catalonia

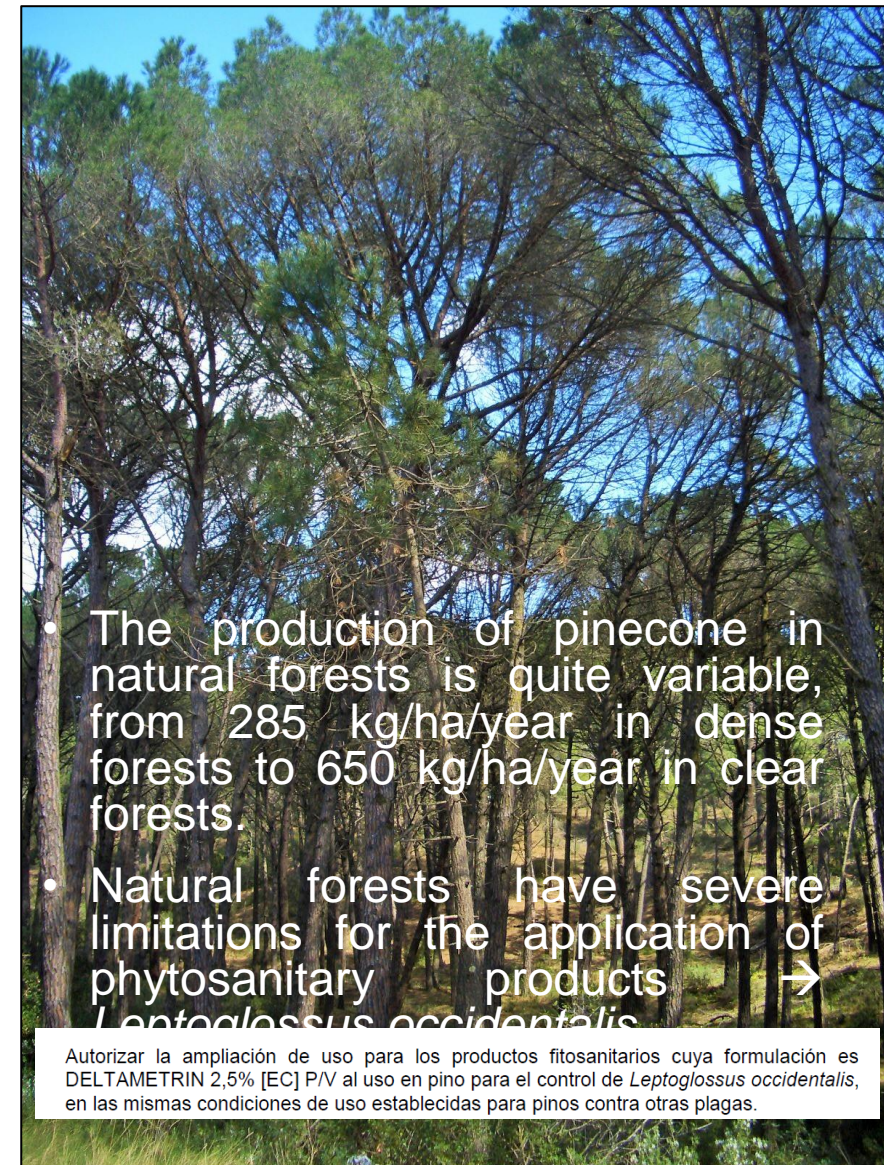
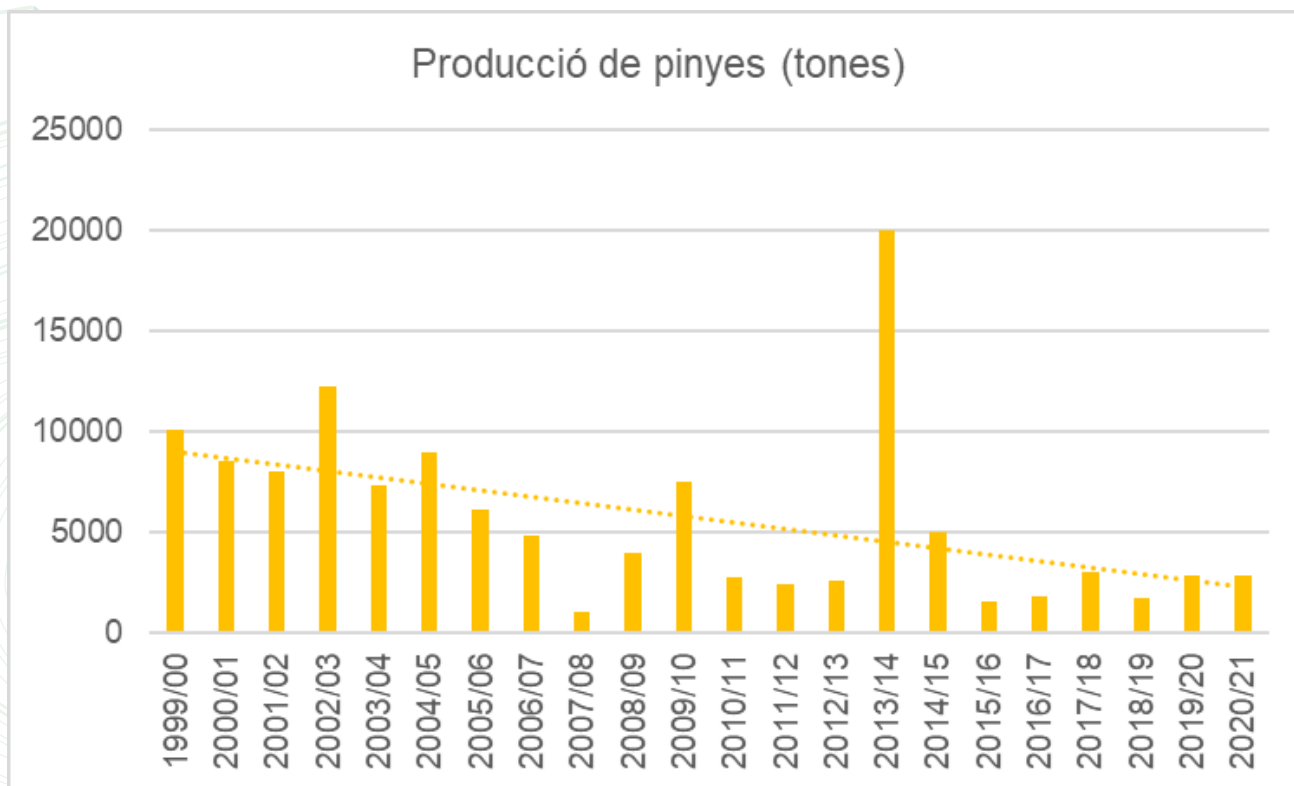
- In Catalonia, the harvesting of pinecones is regulated, and it is necessary to have a license, in addition to having the permission of the owner of the land, mostly private.
- The owner can reserve the collection by marking the areas with a sign.



- It can be collected between November 1 and May 15.
- Harvesting can be by accessing the tops using ladders, poles or lifting platforms, or by mechanical vibration.

Extensive vs agronomic use

- Until now, the pinecone has taken advantage of natural forests or naturalized repopulations in which:
 - No natural selection has taken place.
 - There has been no vegetative propagation of genotypes selected for pinecone production.



- The production of pinecone in natural forests is quite variable, from 285 kg/ha/year in dense forests to 650 kg/ha/year in clear forests.
- Natural forests have severe limitations for the application of phytosanitary products → *Leptoglossus occidentalis*

Autorizar la ampliación de uso para los productos fitosanitarios cuya formulación es DELTAMETRIN 2,5% [EC] P/V al uso en pino para el control de *Leptoglossus occidentalis*, en las mismas condiciones de uso establecidas para pinos contra otras plagas.

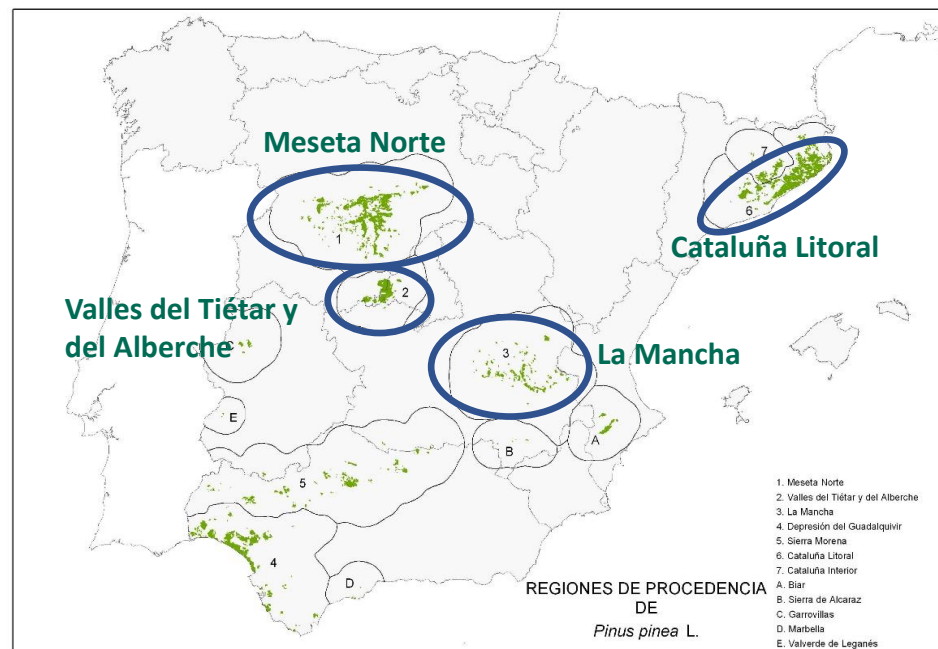
Extensive vs agronomic use

- Recently, the species has begun to be domesticated and installed in plantations designed to produce fruit.
- The agronomic use of the species starts from the use of **grafted plants**, since this allows obtaining pinecones in just three or four years, propagating superior clones in pinecone and pine nut, and generating trees with lower and open tops.
- Although the experiences are still limited, the productions aim to be much higher than the average of those obtained in natural forest conditions.
- It could be said that the cycle of natural forests is closing, and the arboriculture of stone pine is starting.



Stone pine grafting program

- For the commercialization of forest reproduction materials, Spanish regulations are included in Royal Decree 289/2003, which incorporates Directive 1999/105/EC into internal regulations. Within the framework of this legislation, the Forestal Catalana's stone pine grafting program is being de

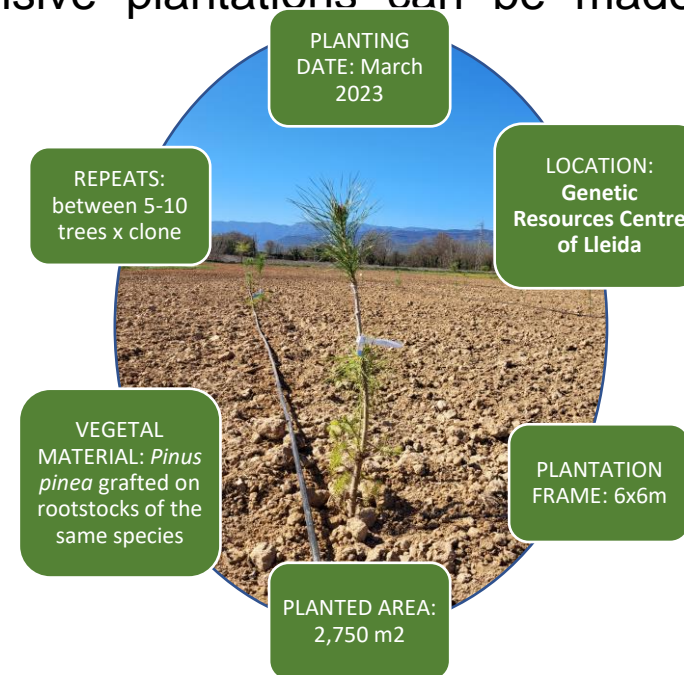
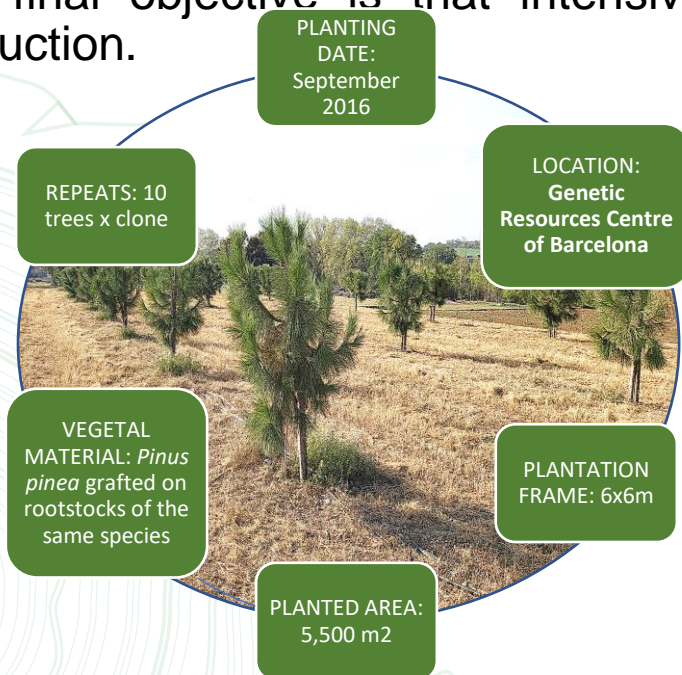


There are currently 15 registered clones from 4 Spanish regions



Mother plant fields

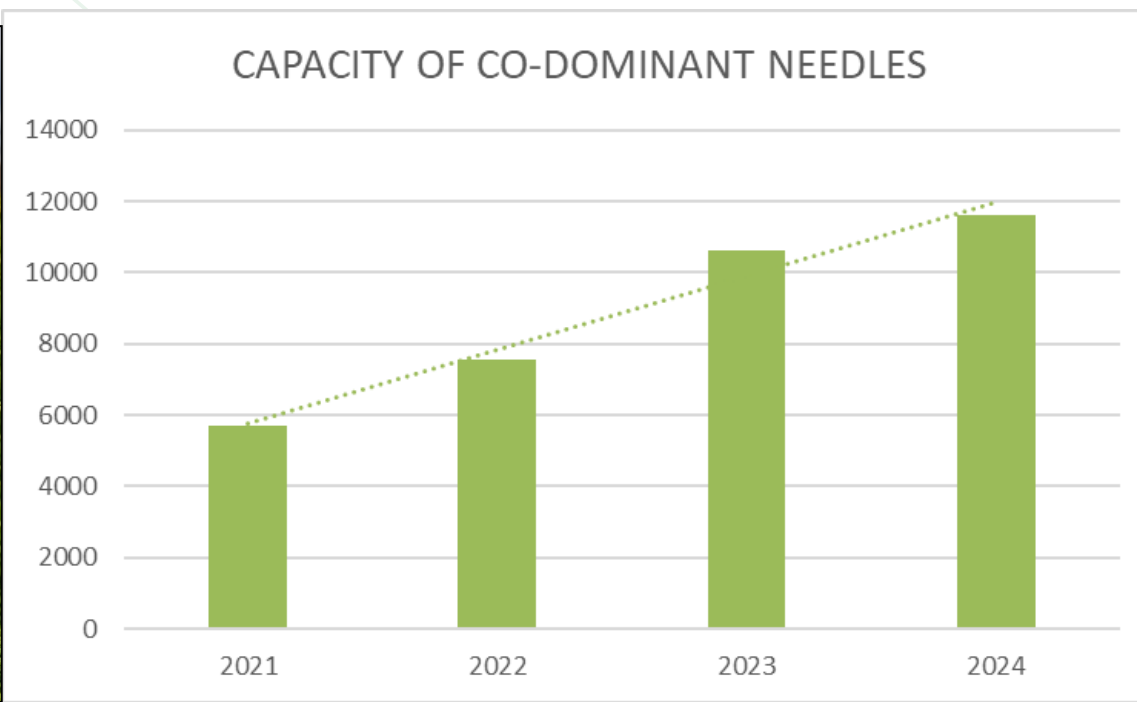
- **Mother plant fields** (MPF) are established and registered to produce needles from clones registered in the Spanish catalogue for direct commercialization or to produce grafted plants in the nursery itself.
- Two MPFs are currently available in FC that include the 15 genotypes registered in Spain to date.
- The final objective is that intensive or semi-intensive plantations can be made for pinecone production.



- The fact of having 2 MPF and the forecast to continue making more is due to the good reception of

Mother plant fields

- With data from 2021 to 2023, the optimal needles collection phase for our location in Gerona has been established between the end of March and the end of April, assuming an average duration of 30 days.
- Between 25-30% of the co-dominant needles are removed.
- Of the harvestable needles, only 0.5% of the these end up being damaged or discarded.



Grafting in nursery or field?

Advantages of carrying out grafting on a nursery compared to grafting in the



Allows protection against weather agents.

It allows the control of the environmental conditions of the cultivation of the rootstock (in plantations it is always necessary to resort to needles of colder origins).

It allows to reduce the time between the collection of the needles and the carrying out of the graft.

It facilitates the provision of experienced workers.

It supports making revisions and continuous cultural work.

It guarantees obtaining a live grafted plant.

Grafted plant production

- Grafted plant production can be done on rootstocks of different species, *Pinus pinea* and *Pinus halepensis* being the most common.
- Grafting in the nursery has a success rate close to **80%** while in the field it does not exceed 50% according to data from recent years.
- Graft yields in the nursery are between 18 and 20 per person per hour, being higher on *Pinus pinea* rootstock than on *Pinus halepensis*.
- The commercial plant that we can find on the market is usually of two saps, in a container with an approximate capacity of three liters, about 60/80 cm high, and has a price of between 10 and 12 euros.
- Trials have been initiated for the selection of family progenitors for rootstocks, both of *P. pinea* and *P. halepensis*.



Grafted plant production. Limitations and chal

- Currently the productive capacity of the FC nursery is at 3,000 grafted plants, and will reach 5,000 in the next 2-3 years, but the reality is that there is **little availability** of (legal) **needle** in the Spanish market. This situation, together with the **short time window for grafting** and the difficulty of finding **grafting experts**, lead to a large gap between plant availability and current demand.



- Work must be done to produce good quality plants, with clones with a proven average superiority in terms of pinecone production and promote plantations with high genetic variability. For this we need:
 - Describe the requirements applicable to the commercialized plants, both qualitative criteria (wounds, deformed root system, desiccation, etc.) and quantitative criteria (diameter of the root collar and height) for each age and format.
 - Expansion of current clones.
 - Recommendations for use → mixture of clones.
 - Register clones from other regions of origin.
 - Selection of rootstocks as parents of qualified category families.

CONGRESSO PINEA SPOT
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Responsible Entity:



Sponsor:



Organisation:



Co-financed by:



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