

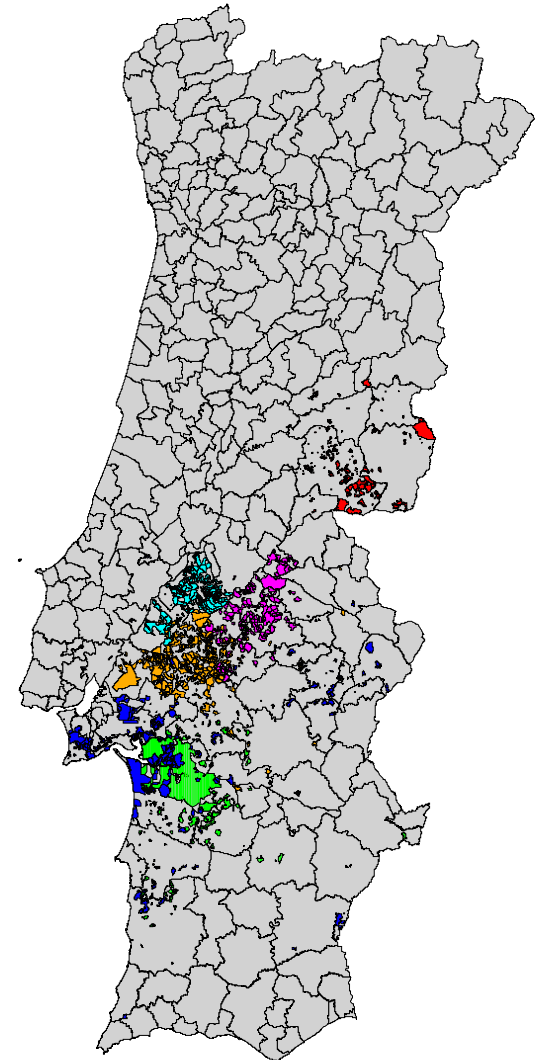


## “Managing *Pinus pinea* forests for people and nature in Portugal. Key challenges”

# UNAC in a nutshell...

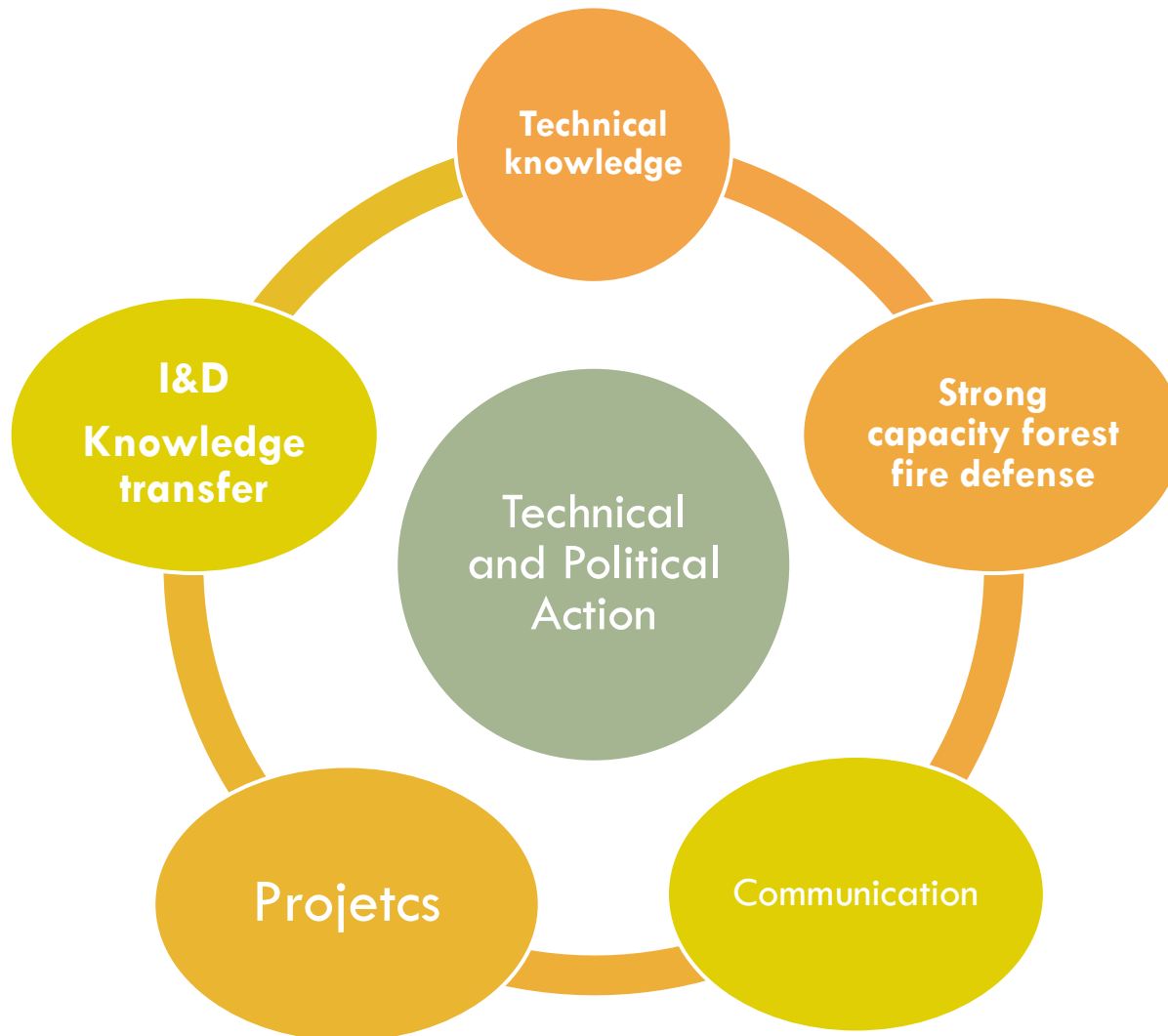
2

- 7 forest-owners organisations
- 700.000 hectares of rural land (agro-forestry)
- Cork-oak forest (Montado) is the main forest system, although the intervention area covers the main Portuguese forest systems



# UNAC in a nutshell...

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## 4

# *Introduction to Pinus Pinea*



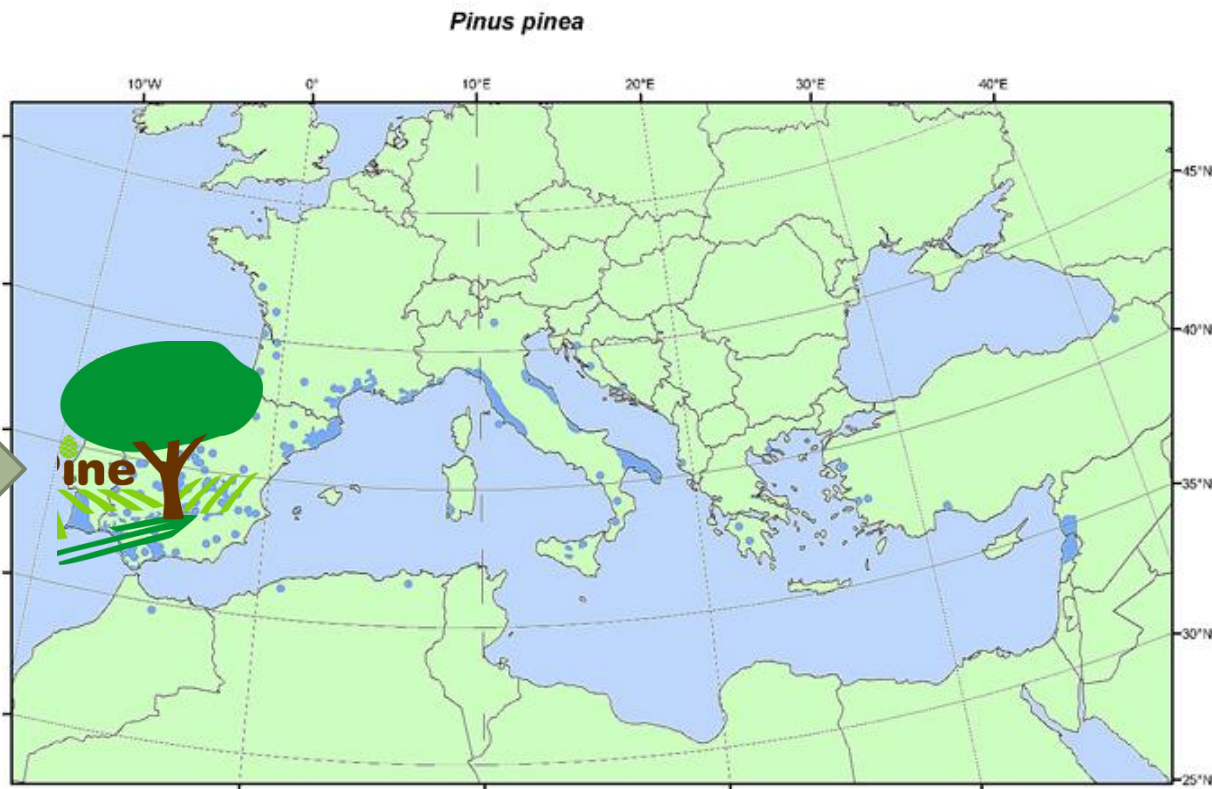


# Pinus Pinea Distribution

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550.000 ha



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and other maps at  
[www.euforgen.org](http://www.euforgen.org)

This distribution map, showing the natural distribution area of *Pinus pinea* was compiled by members of the EUFORGEN Networks

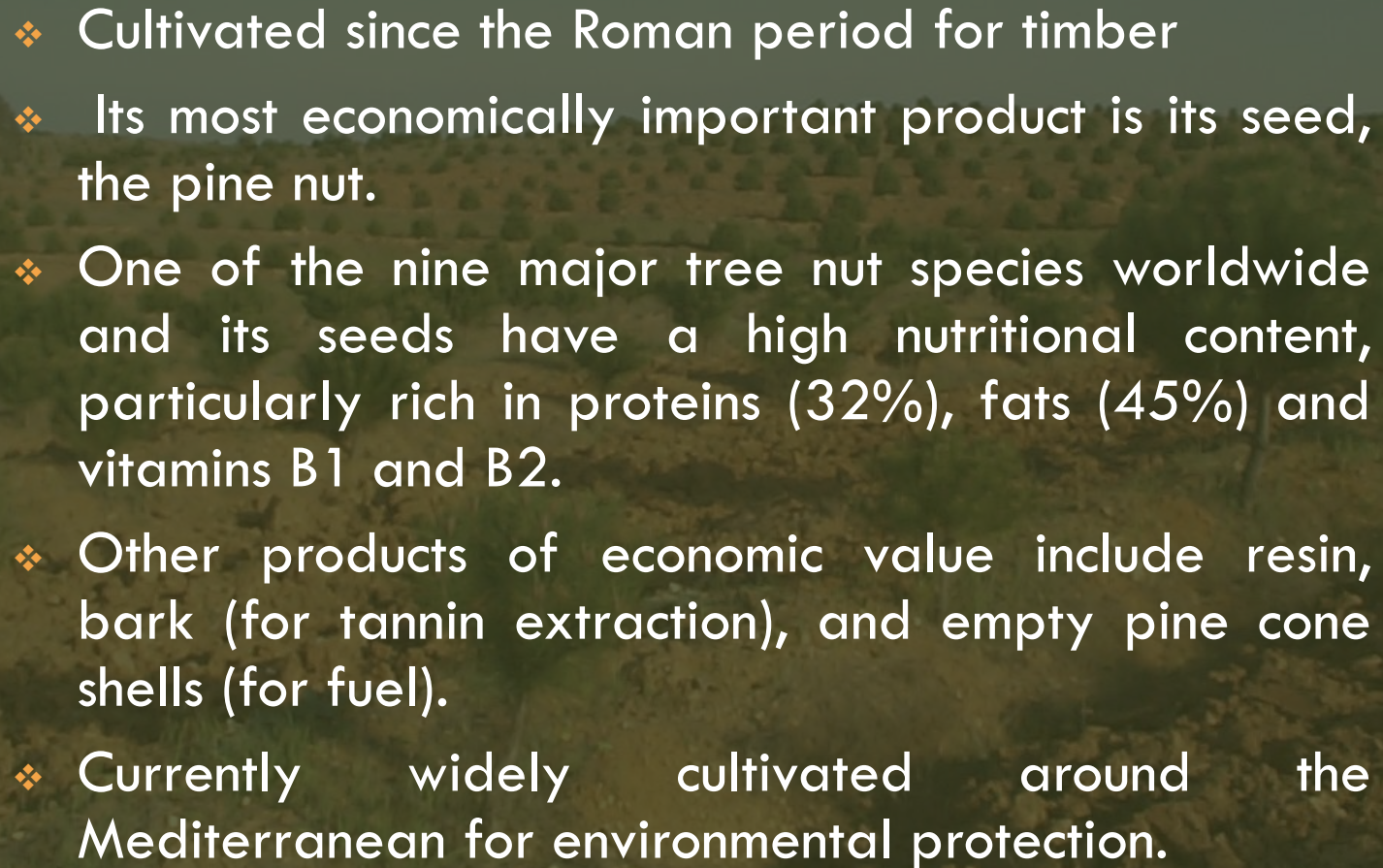
Citation: Distribution map of Italian stone pine (*Pinus pinea*) EUFORGEN 2009, [www.euforgen.org](http://www.euforgen.org).

First published online on September 2004 - Updated on 24 July 2008

0 250 500 1,000 Km

# *Pinus Pinea* importance and use

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- 
- ❖ Cultivated since the Roman period for timber
  - ❖ Its most economically important product is its seed, the pine nut.
  - ❖ One of the nine major tree nut species worldwide and its seeds have a high nutritional content, particularly rich in proteins (32%), fats (45%) and vitamins B1 and B2.
  - ❖ Other products of economic value include resin, bark (for tannin extraction), and empty pine cone shells (for fuel).
  - ❖ Currently widely cultivated around the Mediterranean for environmental protection.



# *Pinus Pinea* importance and use

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- Main interest is the production of pine nuts
- Potential for gourmet and health food (rich flavour and excellent dietetic values)
- High market value



THE ONLY  
PINE SEED OIL  
100% NATURAL

CERTIFIED  
WORLDWIDE



# *Pinus Pinea* importance and use

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## □ Traditional, gourmet and health food



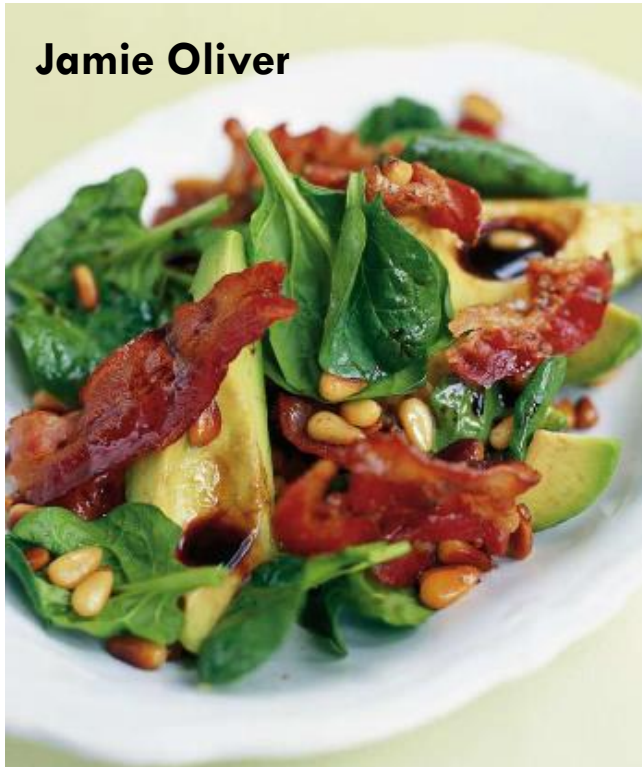


# *Pinus Pinea* importance and use

9

- Traditional, gourmet and health food

**Jamie Oliver**



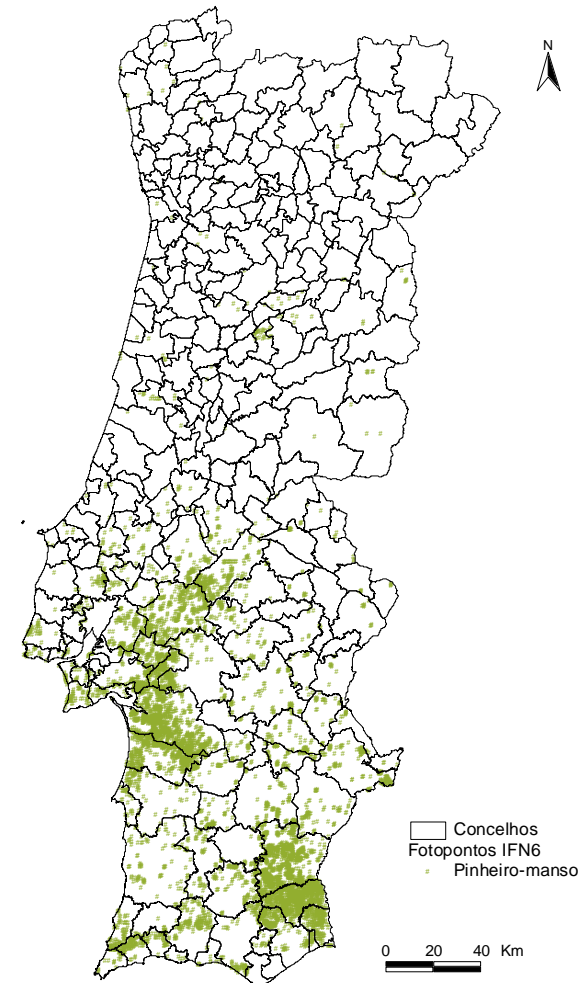
**José Avillez**



# *Pinus Pinea* in Portugal

10

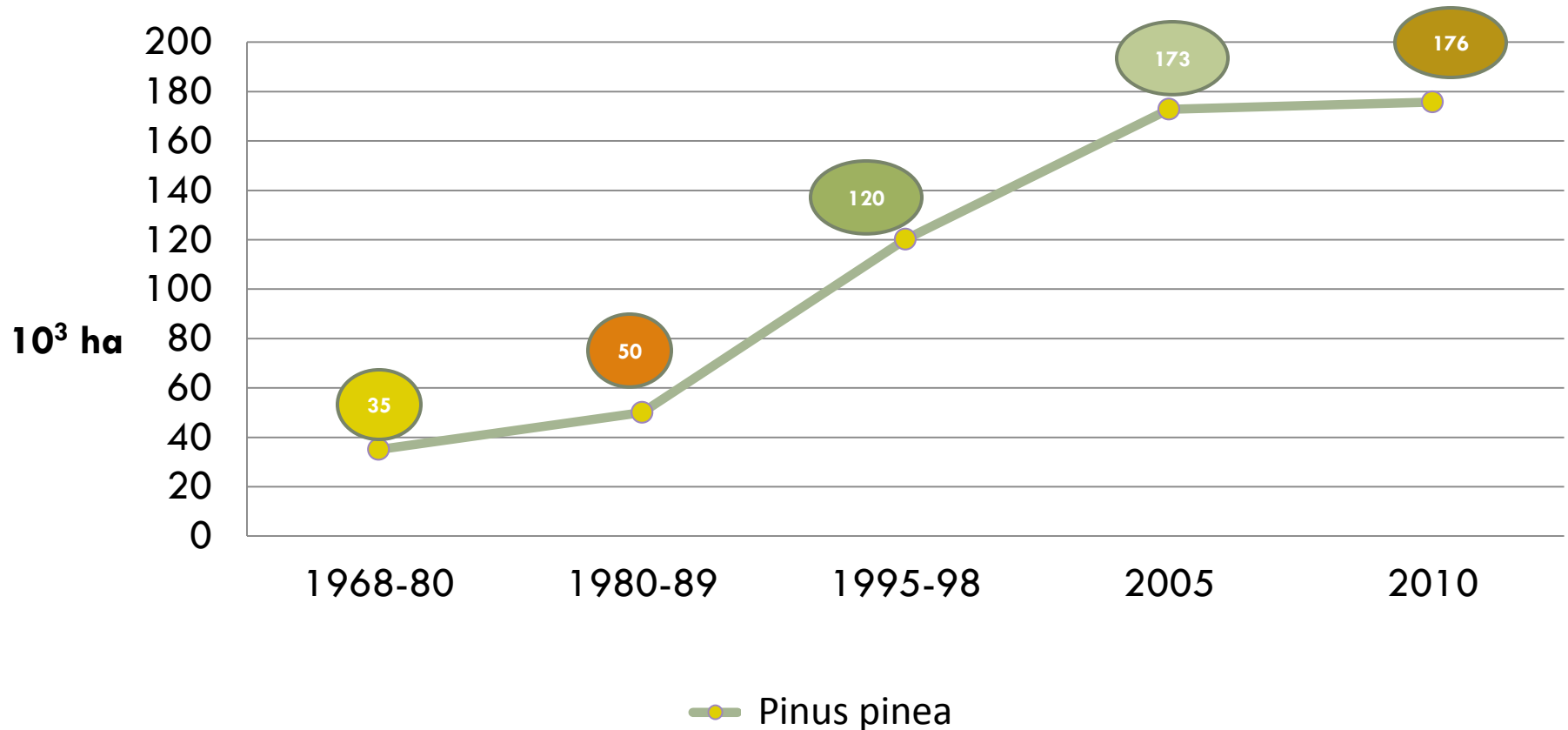
- 176.000 ha
- Growing interest among forest producers:
  - Forestry measures in agriculture (mainly in the 90's)
  - 40 Millions € investment (2000-2012)
  - Profitability
  - Resilience
  - Works as agroforestry system



# Pinus Pinea in Portugal

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□ 126.000 ha growth in 30 years

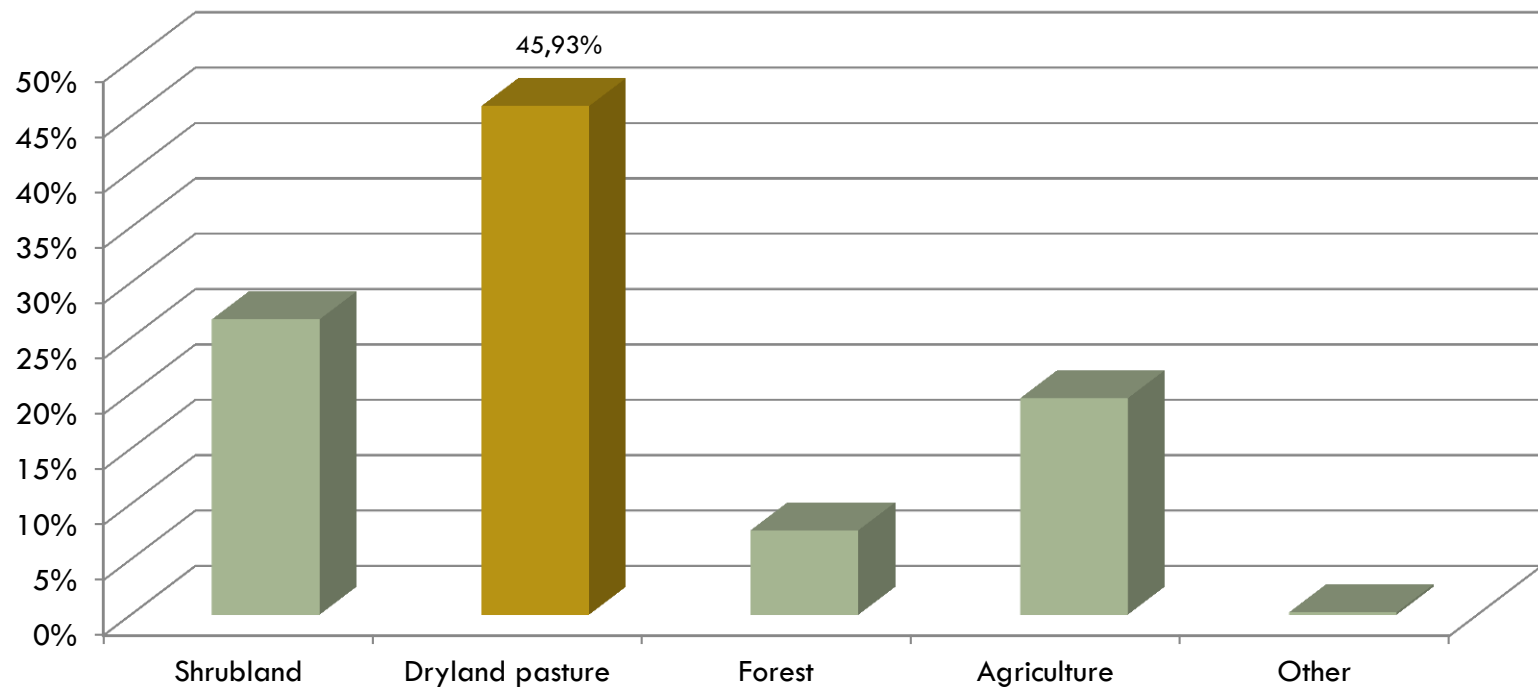




# *Pinus Pinea* in Portugal

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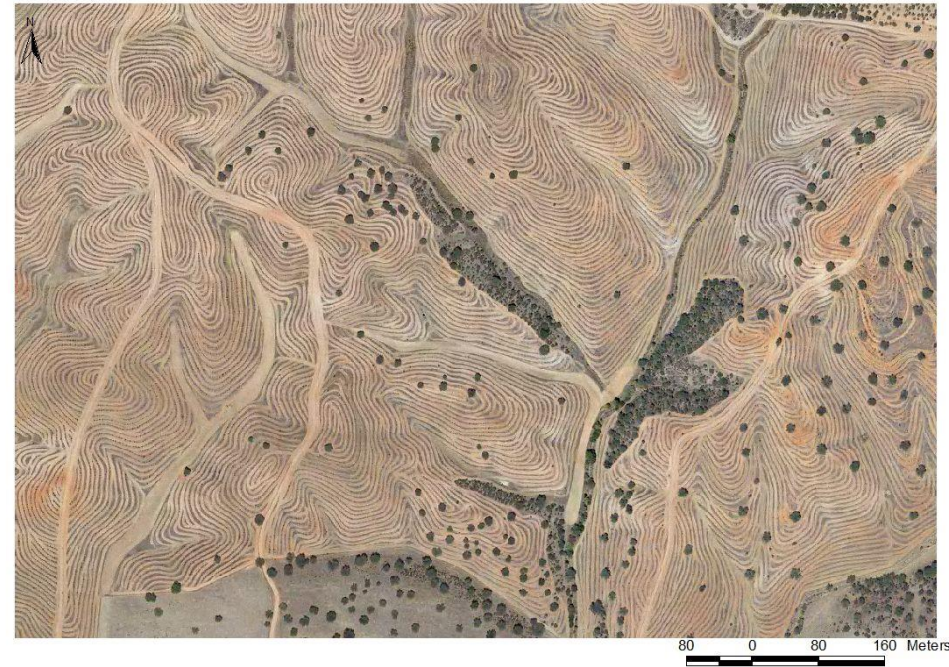
- Growth (1995-2010) mainly in agricultural areas



# *Pinus Pinea* in Portugal

13

- Growth (1995-2010) mainly in agricultural areas





# *Pinus Pinea* in Portugal

14

- Plantations (afforestation for pine nuts production)





# *Pinus Pinea* in Portugal

15

## □ Natural pure stands

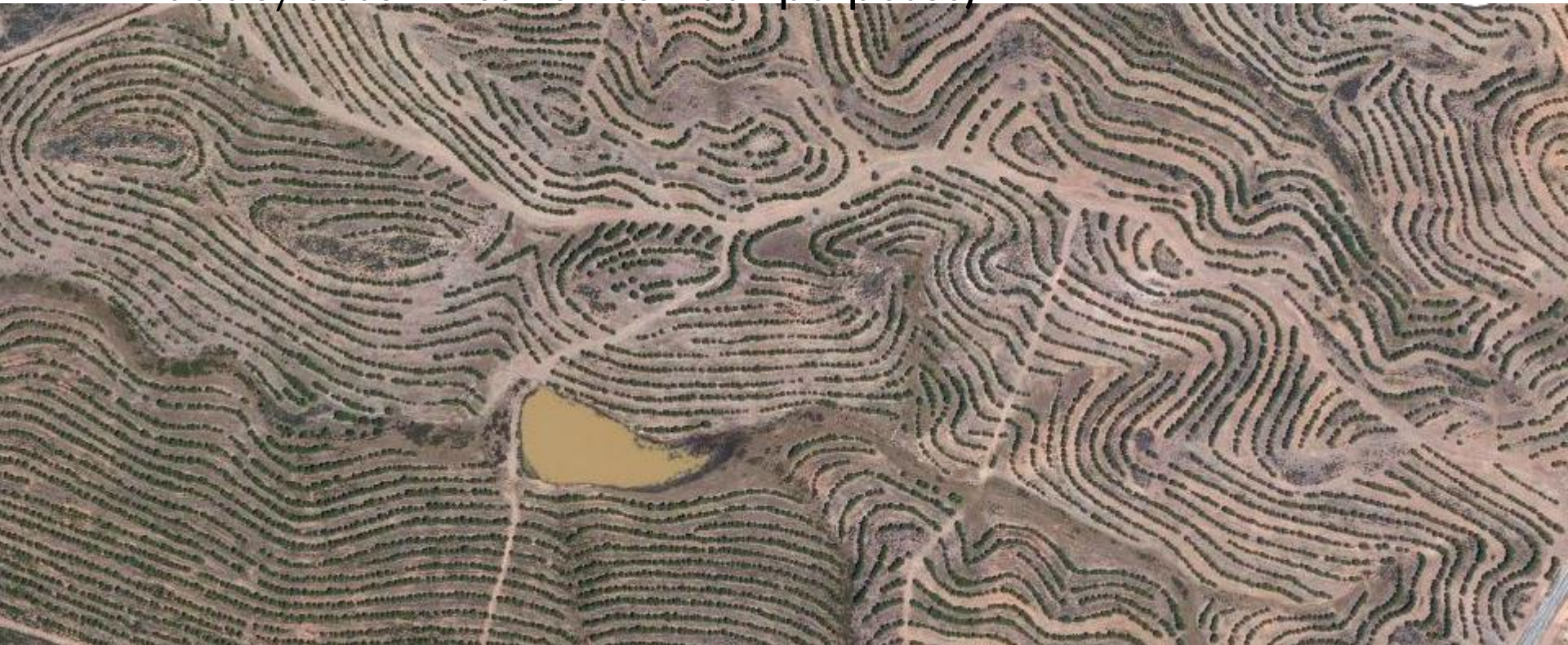




# *Pinus Pinea* in Portugal

16

- Plantations (afforestation of agricultural areas for set aside/desertification combat purposes)





# *Pinus Pinea* in Portugal

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- **Plantations** (afforestation of agricultural areas for set aside/desertification combat purposes)



## **Afforestation (2000-2011)**

- 12.176 ha
- 18,5 Million €



# *Pinus Pinea* in Portugal

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- Mix natural stands and plantations (afforestation of the clearings for pine nuts production)

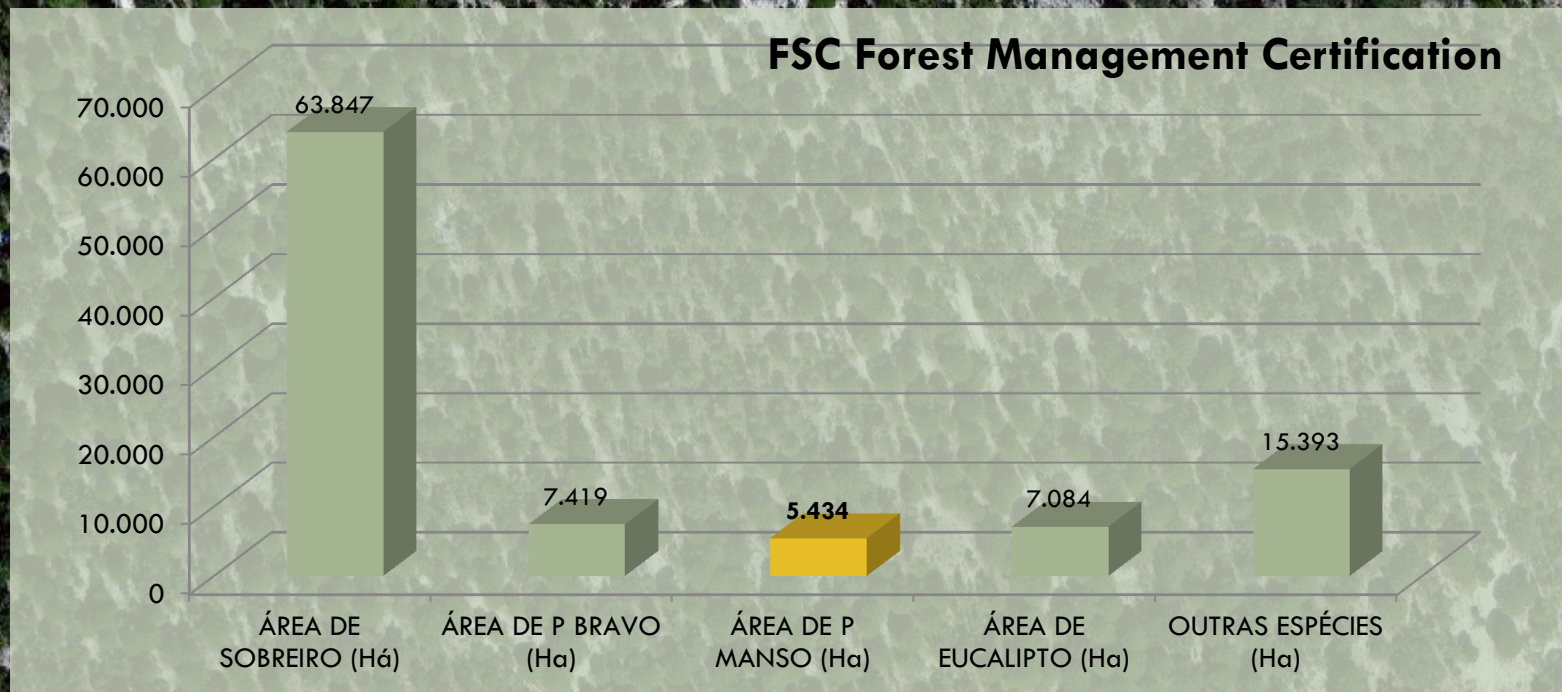
## **Forest Management (2000-2011)**

- 26.068 ha
- 20,78 Millions €

# Pinus Pinea in Portugal

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- Natural mixed stands (cork oak and stone pine)

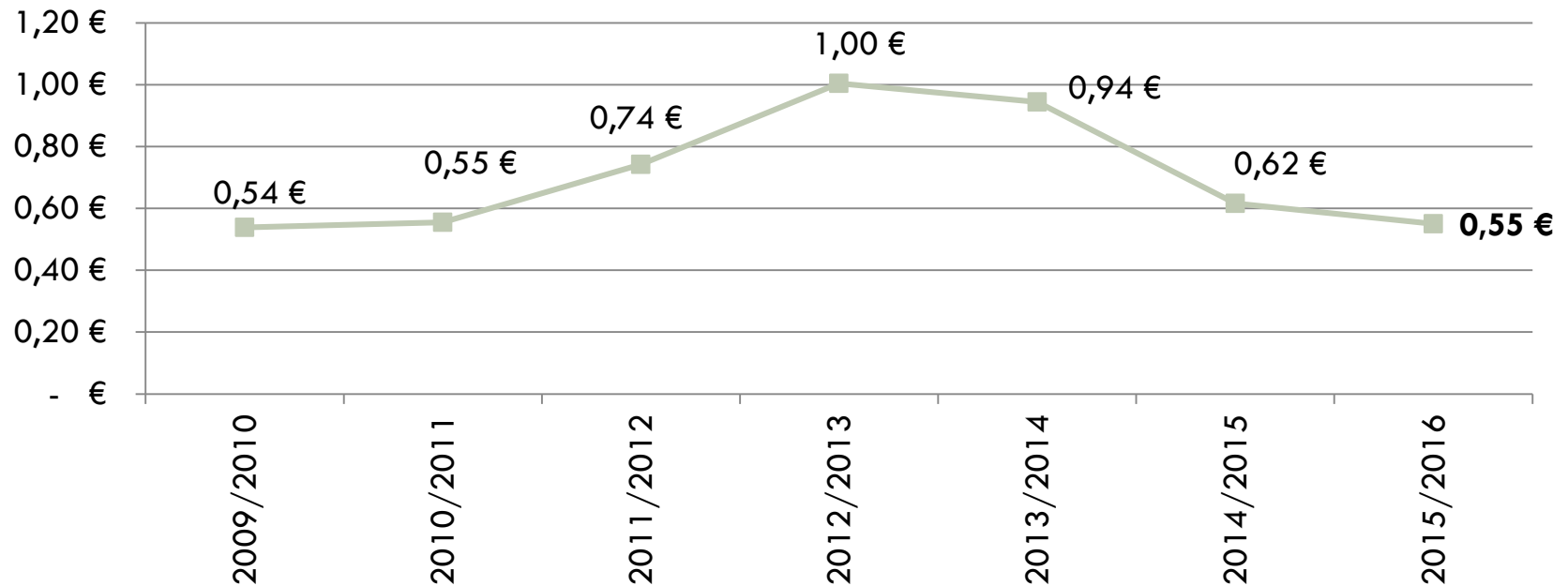


# Main driver for this investment...

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Profitability

Annual  
income





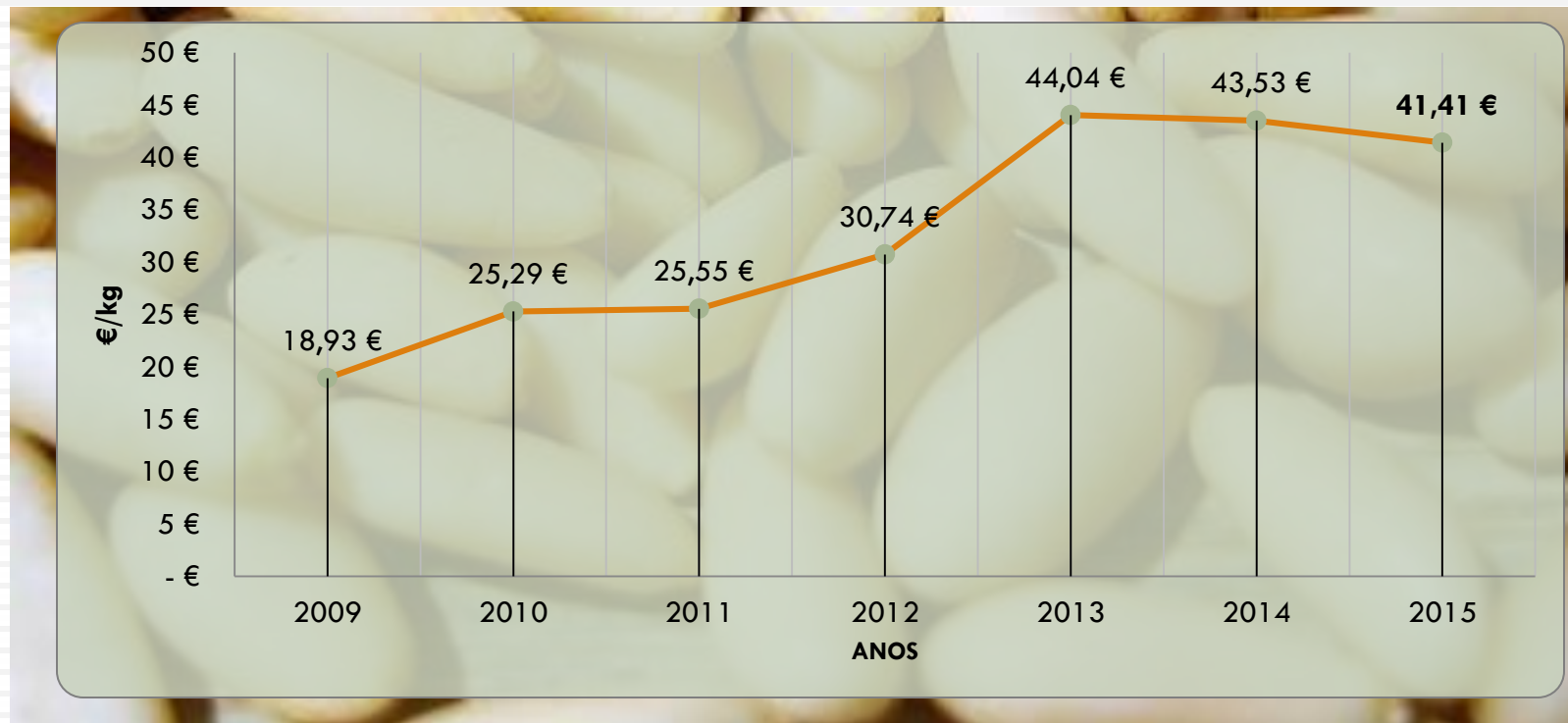
# Main driver for this investment...

21



22

## KERNELS PRICE (LONJA DE REUS)





# Silviculture

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UNAC - Mediterranean Forest Union



# Silviculture

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UNAC - Mediterranean Forest Union

# Silviculture

25



UNAC - Mediterranean Forest Union



# Silviculture

26



UNAC - Mediterranean Forest Union



# Grafted plantations

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- In Italy, Portugal and Spain, research on grafting techniques and on clonal selections has been undertaken aiming the improvement and standardizing of pine nut production in specific plantations or under agroforestry systems

# Grafted plantations

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**Production  
Anticipation  
with Grafting  
Technique**



UNAC - Mediterranean Forest Union



# Grafted plantations

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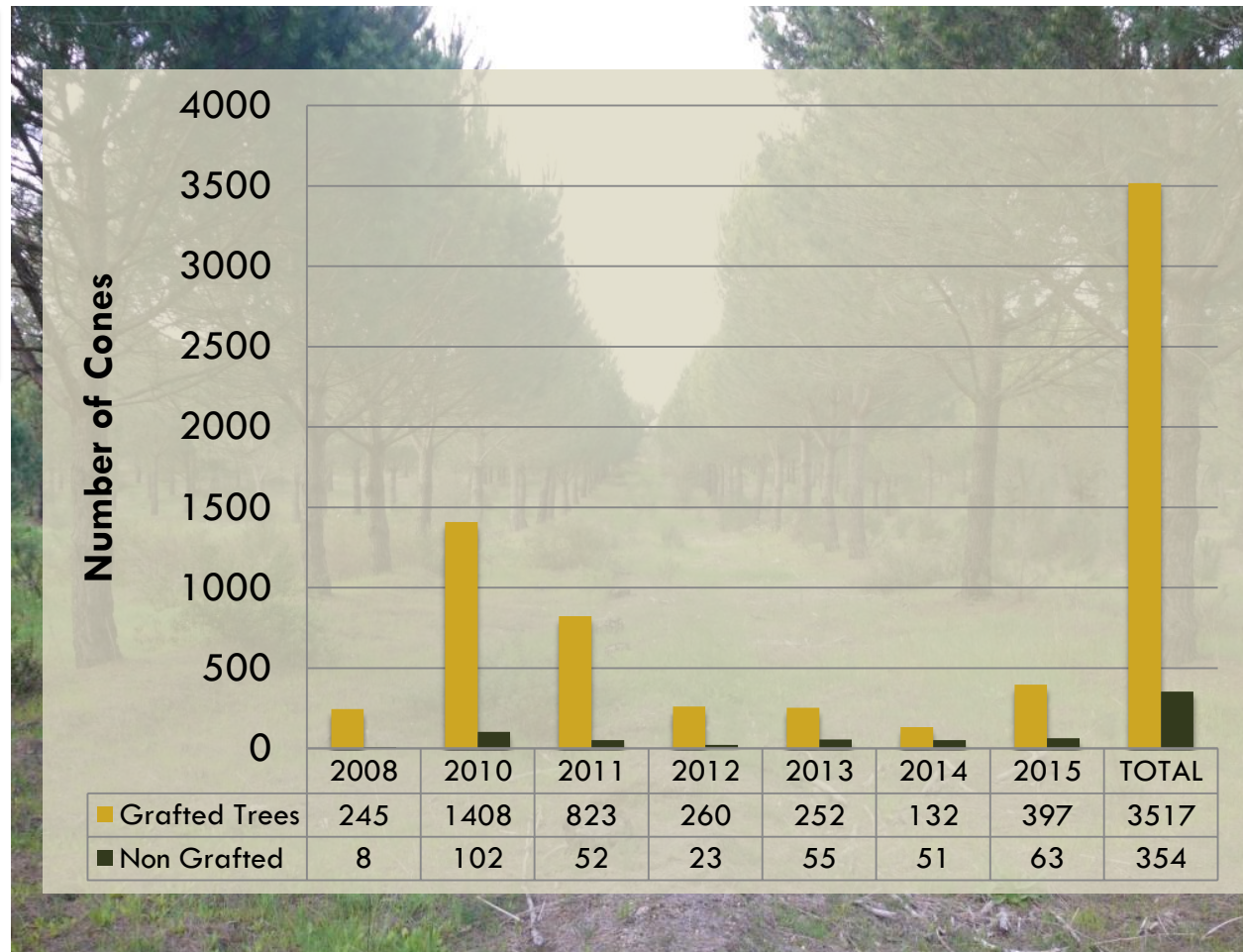
**Increased  
Production with  
Grafting  
Technique**



# Grafted plantations

30

## Clonal Stands for scions production



# Key Challenges ?

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## STRENGTHS

1. Product Quality
2. Ecological potential of the species
3. Grafted plantation
4. Others
  - main suppliers of Mediterranean pine nuts
  - relevance for rural economy
  - sustainability
  - tradition, cultural heritage
  - support by voluntary local politics
  - expertise from other sectors

## WEAKNESSES

1. Lack of knowledge
2. Lack of traceability
3. Pests and diseases
4. Others
  - small relevance both in surface & economies
  - labour security risks
  - low yields (per hectare, kernels% per cones)
  - stumpage (previous accorded price for estimated cone yield before harvesting)



# Key Challenges ?

## OPPORTUNITIES

1. Organic & Health market growth
2. New planted areas increase supply
3. C.A.P. & Rural Development funds opportunities
4. Others
  - mechanical harvesting
  - homologation of insecticide for control of *Leptoglossus* seed pest
  - experiences from other countries
  - opportunities on international markets

## THREATS

1. New pests and diseases
2. Competition from Turkey and Asian pine nuts
3. Climate change
4. Others
  - domestic consume is low
  - retail price is excessive

# Forest fire prevention...challenges

33



João Pinho



# Silvicultural challenges...

34

- Pest and disease control
  - There are few pests or fungi that affect vigorous pines.
  - Only unusual outbreaks (Scolytidae) can kill the trees



# Silvicultural challenges...

35

## □ Pest and disease control

□ insects whose cone-boring larvae/ feeding can destroy or diminish the yield:

- the weevil *Pissodes validirostris*
- the moth *Dioryctria mendacella*
- the *Leptoglossus occidentalis*

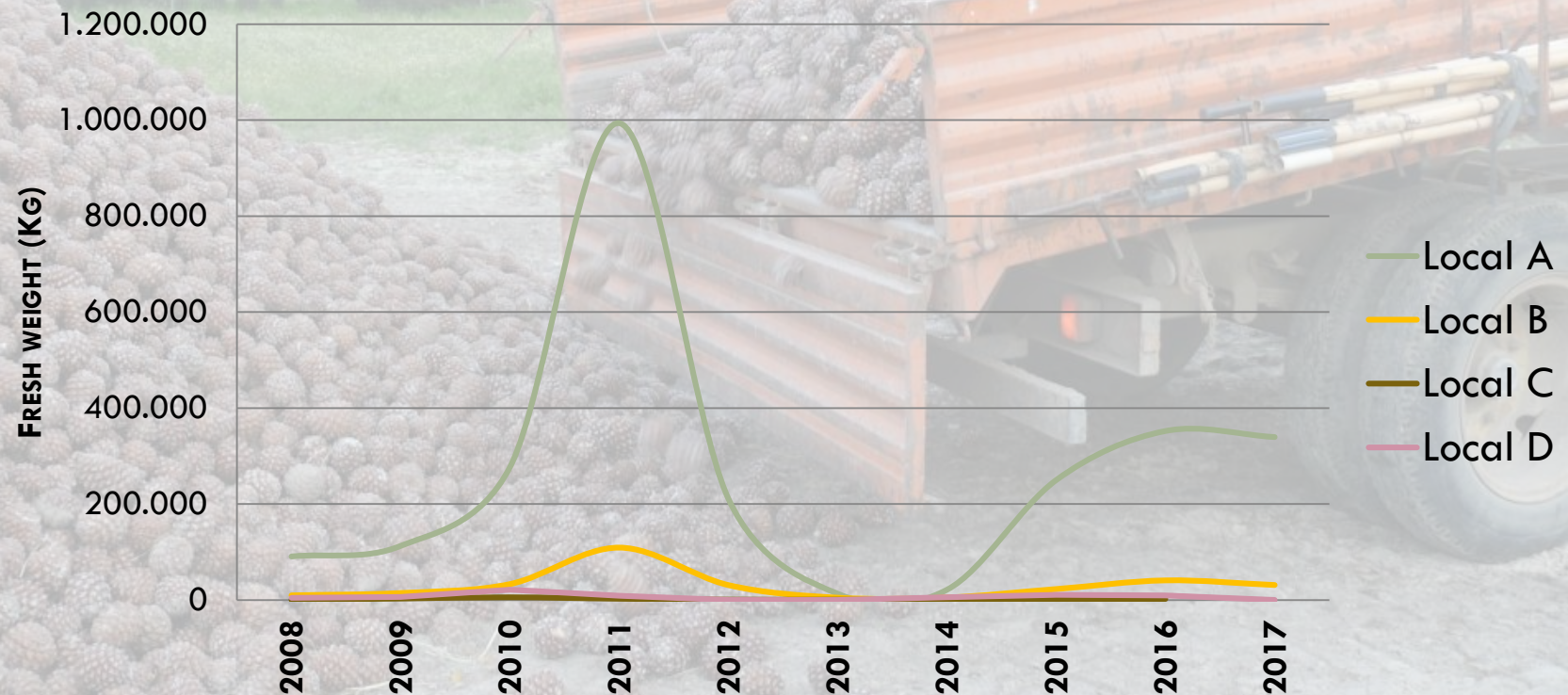




# Silvicultural challenges...

36

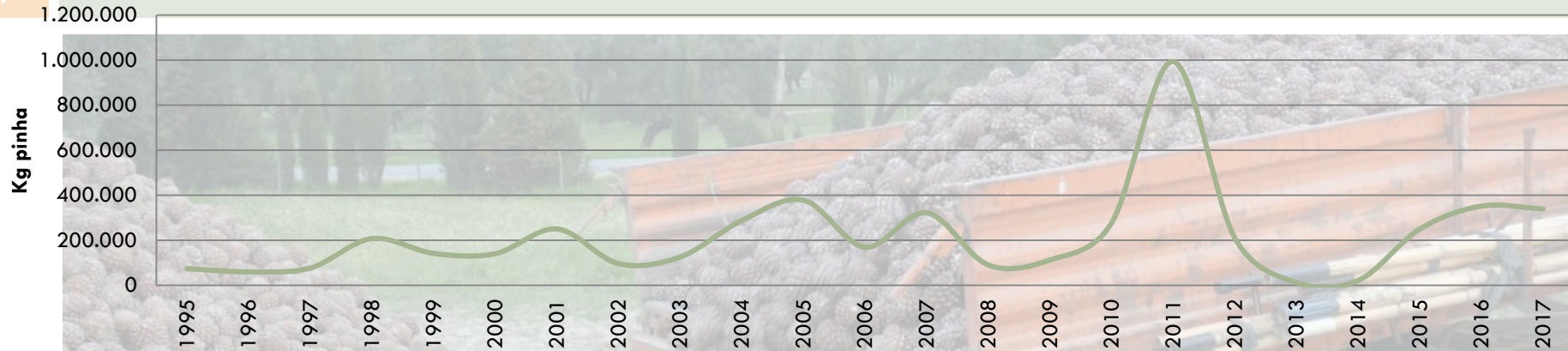
## CONE PINE PRODUCTION



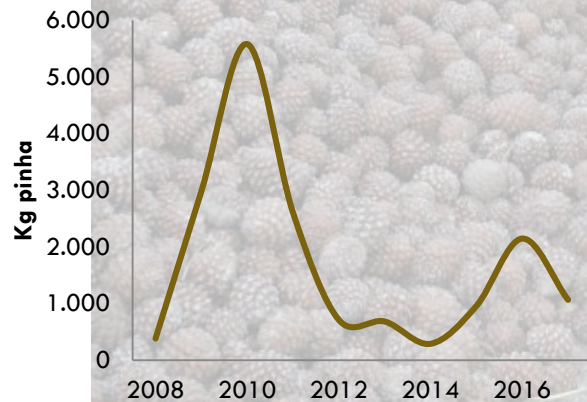
# Silvicultural challenges...

## Local A

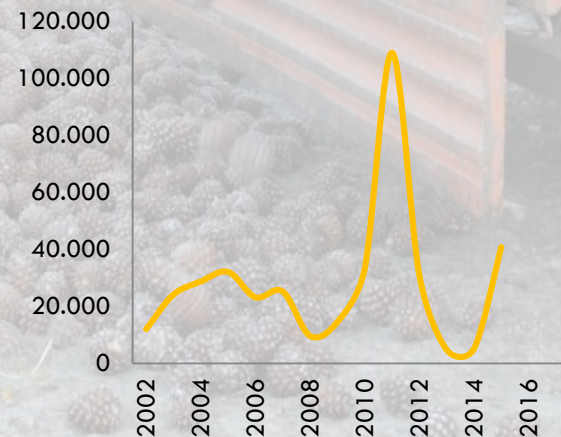
37



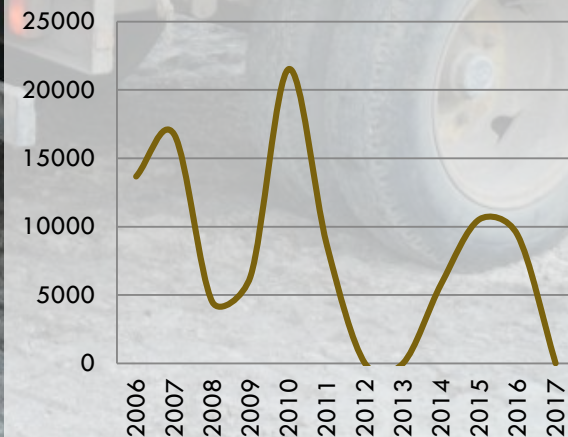
## Local C



## Local B

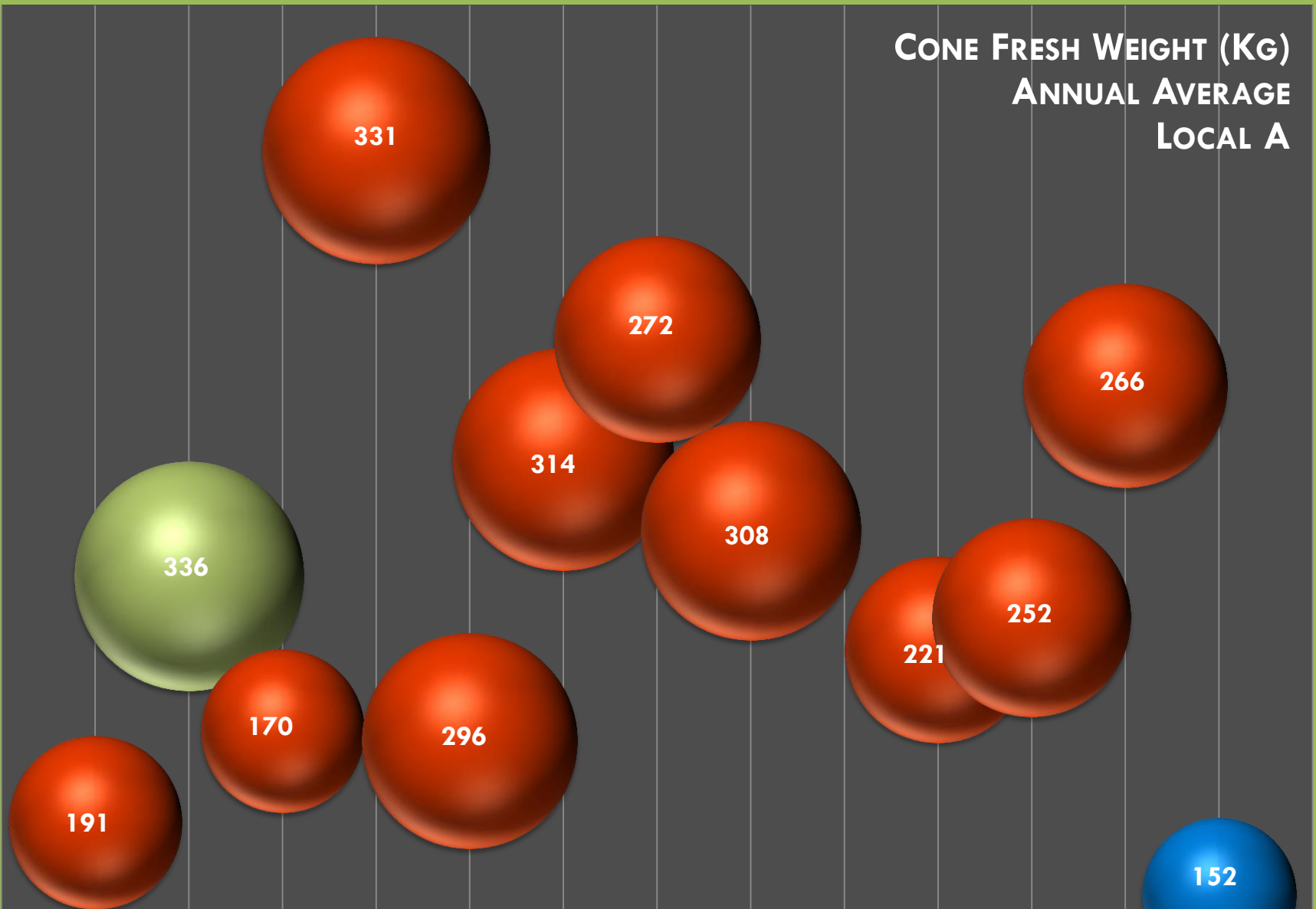


## Local D





**CONE FRESH WEIGHT (KG)  
ANNUAL AVERAGE  
LOCAL A**



2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

# Address market failures...

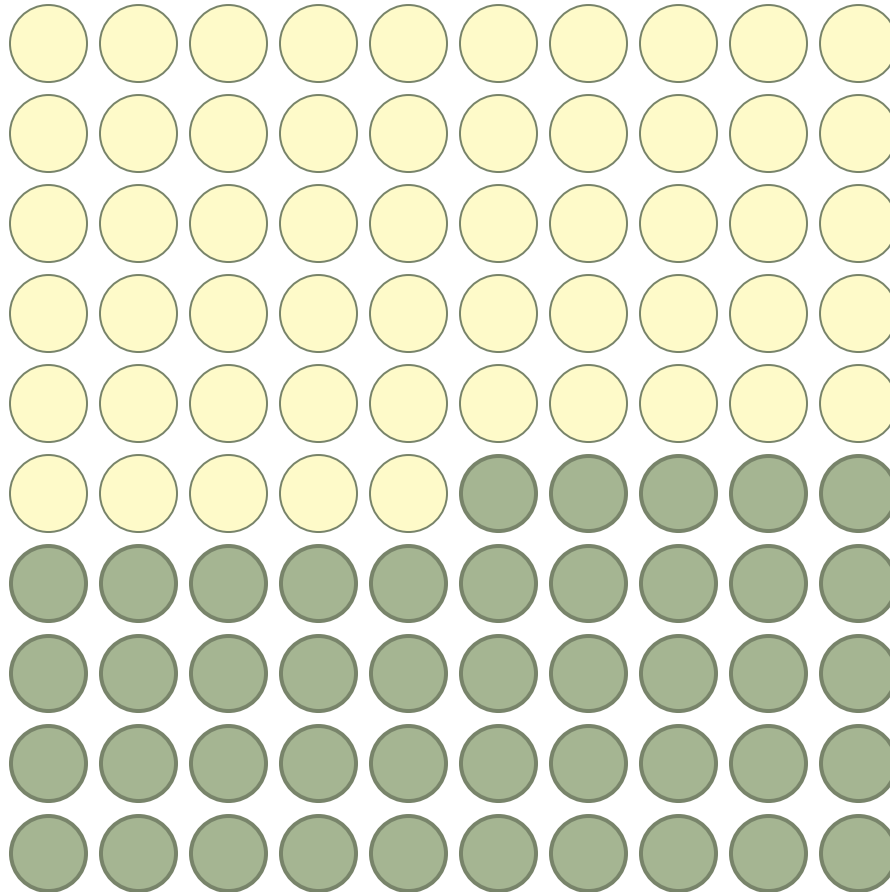
39

Local	Pine cone fresh weight (Kg)	Pine cone average weight (Kg)	Racio pine seed/ pine cone	Average weight pine seed (g)	Kernel yield (%)
1	81,15	0,301	13,93%	0,80	2,60%
2	88,21	0,327	12,72%	0,76	2,71%
3	100,08	0,477	16,54%	0,91	3,65%
4	90,10	0,429	12,99%	0,91	3,61%
5	105,30	0,501	16,90%	1,16	3,83%
6	102,90	0,429	16,52%	0,98	3,53%
7	105,70	0,503	14,81%	0,98	3,27%
8	85,55	0,317	15,20%	0,94	3,34%
Média	94,87	0,410	14,95%	0,93	3,32%



# Social challenges...

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Pine cones collected  
by the buyer

55%

Pine cones collected  
by the owner/ forest  
producer

45%

# Social Challenges...

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## □ Harvesting

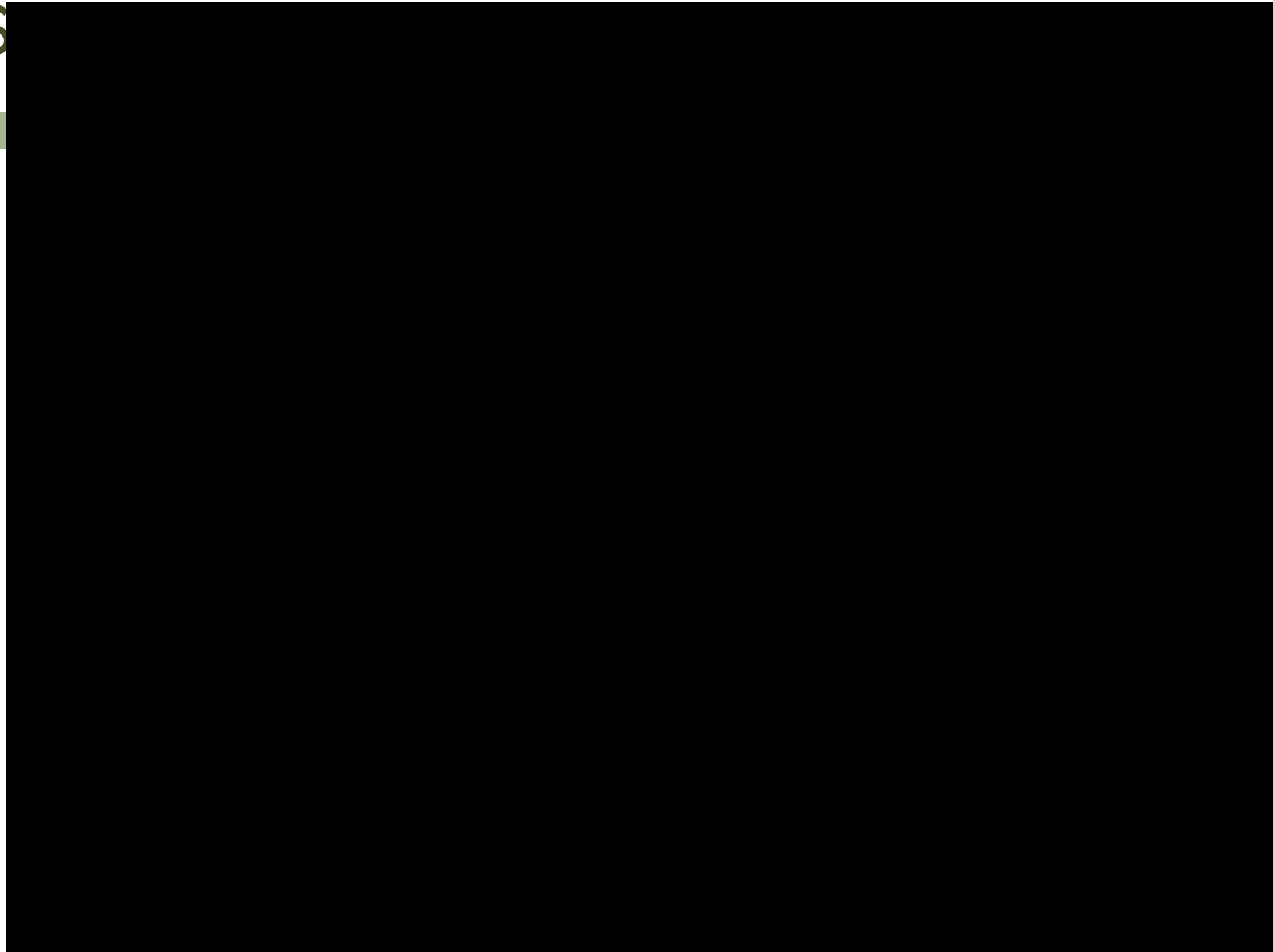
- Still mostly done by skilled workers for the pine climbing for cone dropping.
- In the last decade, cone gathering is starting to be made by harvesting machines.







S



# Educational challenges...

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**CONE PINE STEALING**

**BLACK MARKETS**

**INFORMAL ECONOMY**

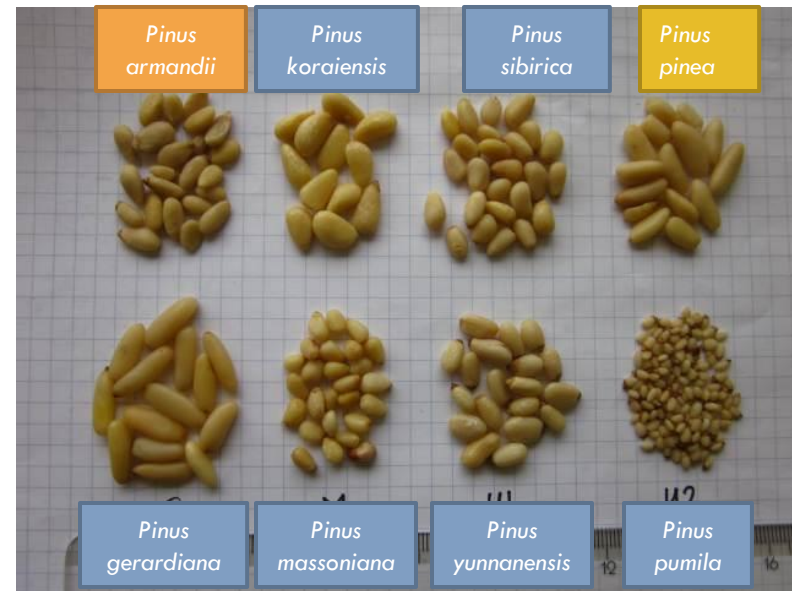
**HEALTH & SAFETY  
IRREGULARITIES**





# Educational challenges...

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## Pinus species producing pine nuts

- ▣ *Pinus pinea*
- ▣ *Pinus koraiensis*
- ▣ *Pinus sibirica*

- ▣ *Pinus yunnanensis*
- ▣ *Pinus wallichiana*
- ▣ *Pinus gerardiana*
- ▣ *Pinus Pumila*



# Key Challenges summary

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## Economical

- Increase/ anticipate the pine cone production
- Diminishing annual fluctuations
- Recover the pine nuts yield (climate change? pests?)
- Develop sampling methodologies to evaluate pine nut yield
- Find alternative products/ services for the non productive plantations

## Social

- Increase the areas mechanically harvested
- Assure proper safety to the workers
- Increase media and social knowledge about the Pinus pinea and the pine nut
- Decrease informal/ grey markets (also decreases stealing)
- Knowledge transfer about the best practices in terms of management
- Labelling

## Environmental

- Ecosystems payments
- Minimize pests and diseases



# Thanks!

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***unac***

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**União da Floresta Mediterrânica**

