Situation of tapping activity in Spain: focus on the current research scenario

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I. History

II. Opportunity

III. Current situation

IV. Research


I. History: Pine trees and resin

More than 20 uses of resin mentioned in the first century in Columela’s texts

Platearius, M. (S. XII). Le Livre des simples médecines

Pitta (πιττα) means ‘resin’

Pitys (πιτυς) means ‘pine tree’
I. History: brief overview

Alfonso X de Castilla en 1256: First written regulation

Spanish navy

70 ships and 50 frigates

Factories

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<th>13th Century</th>
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<th>15th Century</th>
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Historical Peak

External: Drop in resin price
Internal: Lack of sector structure
II. The opportunity (2008-2014)

- Sharp increase in the price of natural resins
- Labor restructuring process
- EU's rural development and environmental policies
- **PASSFOR**: Plan for activation of the Spanish Forest Sector

*Source: CESEFOR, 2009, Picardo, 2014*
III. Current situation

- **Fragile**
  - Consolidation (?)
- **Hopeful**
  - Growth and development (2009-2014)
  - First steps (2007)

- Industrial sector support
- Availability of managed pine forests
- Increase of tapping workers
- Lack of government support
- Little funding of scientific activity
IV. Research

Forest Genetics and Physiology Research Group,
School of Forestry Engineering, Technical University of Madrid (UPM)

Resin yield: underlying factors?

- Applied research as a response to sector demand
- Facilitating sector stabilization by improving productivity
IV. Research: Tapping wound reaction in *P. pinaster*
Aim 1:

- What is the influence of constitutive anatomy on resin yield?
- And how do dendrometric and dasometric variables affect resin yield?
✓ Most vigorous - most productive (...but more resin canals?)

✓ Weak relationships between anatomy and resin yield.

✓ Induction of resin flow and canal differentiation

✓ Plant density and soil quality as stress factors have a strong influence on tree reaction

2007 first tapping year

Resin yield (kg/tree)                          AC frequency (number/mm²)

Armuna: High plant density
Melque: Poor soil
Aim 2:

✅ How do different tapping methods affect pine wood anatomy and resin yield?
More than 500 trees tapped using 4 different treatments

Highest mean annual resin yield

Traditional tool upwards direction

Lowest mean annual resin yield

Mechanized treatments
Induced effect processes and axial direction

Axial canal frequency

7 sample/tree
4 studied years

Closer locations and axial direction

Tapping year

-1 year
+1 year
+2 year

Signaling processes

30 cm
15 cm
5 cm
3 cm

3 cm

3 cm

15 cm

3 cm

2010

2011

2012

2013

Above
Aside
Below

Axial canal frequency

3 cm

15
30
3 cm

3 cm

5 cm

3 cm

5 cm

10 cm

Tapping year

+1 year
+2 year

Axial canal frequency

Tapping year
Aim 3:

How do climate and soil water availability affect resin yield?

And how do they affect the anatomical traits related to resin production?
Spring Water deficit and high temperatures stimulate resin yield and canal formation.

Severe summer drought exceeds physiological thresholds, which reduces resin yield and canal formation.
Conclusions

✓ Critical (but hopeful) time period in resin extraction in Spain

✓ Need for more available and reliable information for establishing tapping recommendations

✓ Need for more scientific studies to generate this reliable information

Extensive and reliable bibliography

Improve Tapping methods

Standardized tapping guidelines
Thank you / Muchas gracias