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Poplar cultivation in Italy: history, state of the art, perspectives

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Production of roundwood for industry in ITALY

45% Roundwood

55%

Woodland

1% Areas

99%

Poplar culture
Particleboards and fiberboards; Pulp and paper; Biomass for energy production.

Core of blockboards; Packaging; Semi-finished products for furniture and windows; Furniture components.

POPLAR WOOD
VERSATILITY

CHIPPING

SAWING

ROTARY CUT

Number of defects
Primary processing industries

**Plywood**
- Poplar: 68%
- 90% in 3-5 layers plywood only

**Particle/fibre-boards**
- Poplar: 42%
- 70% for particleboard only

**Pulp and paper**
- Poplar: 19%
- 25% for mechanical pulp

**Packaging**
- Poplar: 25%
- 70% for fruit packaging only
Plywood: the most important product
Plywood for furniture

- spacing: about 300 trees/ha
- rotation: 10 to 12 years, with several operations (e.g. pruning)
- clones: low density and very clear wood
### Characteristics and value of the assortments

<table>
<thead>
<tr>
<th>Logs</th>
<th>I class</th>
<th>II class</th>
<th>III class</th>
<th>Sawing</th>
<th>Paper</th>
<th>Chipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (m)</td>
<td>2,6 – 2,3 – 1,9 – 1,3</td>
<td></td>
<td></td>
<td>2</td>
<td>(2)</td>
<td>-</td>
</tr>
<tr>
<td>Min. diam. (cm)</td>
<td>22-25</td>
<td>20-22</td>
<td>20-22</td>
<td>15-18</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Value in €/m³</td>
<td>95</td>
<td>70</td>
<td>55</td>
<td>25</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>130</td>
<td>90</td>
<td>80</td>
<td>50</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Value in €/t</td>
<td>130</td>
<td>85</td>
<td>70</td>
<td>40</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>180</td>
<td>110</td>
<td>100</td>
<td>90</td>
<td>50</td>
<td>35</td>
</tr>
<tr>
<td>%</td>
<td>100</td>
<td>60</td>
<td>30</td>
<td>15</td>
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</table>

**Price of the standing tree:** 35 - 50 €/t  
**Cost of utilization:** 20-25 €/t  
**Cost of transportation:** 10-15 €/t  
**A mature poplar plantation:** 150 to 170 t/ha of assortments with an average commercial value of 60 €/t
CONVENTIONAL WORKING METHOD

FELLING
with chainsaw

SELECTION & MEASURING
main assortments

DEBRANCHING & CROSSCUTTING

PILING
top-ends & larger branches

CRUSHING or BURNING
thinner branchwood (< 3-4 cm)

IMPROVEMENTS

N.B. In most plantations the extraction is not necessary since the truck can come up by the side of felled trees
Conventional working method

**strengths:**
Established system, needs limited investments and performs a good level of efficiency for the preparation of the main assortments with costs independent from the size of the stand

**weaknesses:**

- Heavy and dangerous work (at some stage)
- Some activities do not require high skills and allow the use of not qualified or irregular workers
- The manual processing of smaller assortments costs more than their value
- Loss of biomass (15 t/ha of branchwood leaved on site)
HIGH MECHANIZED WORKING METHOD

- FELLING & ALIGNMENT with harvester

  - PROCESSING OF MAIN ASSORTMENTS with harvester

    - BUNCHING, (EXTRACTION) & LOADING with forwarder or self-propeller

    - PROCESSING & PILING BRANCHWOOD (4-12 cm) with harvester

      - LOADING with tractor / self-propeller

        - with hydraulic grab

      - or with forwarder

- IMPROVEMENTS

  - BUNCHING BRANCHWOOD with dozer or LOADING / EXTRACTION with forwarder or other machines

  - CHIPPING BRANCHWOOD with chipper & LOADING on open top container
Mechanized working method: strengths

✓ working health/ergonomics

✓ high productivity

✓ increment of technological level

✓ potential for chips ⇒ biomass for energy

✓ working costs similar or lower than the conventional method (19-21 €/t)

✓ combining chipping, the costs are significantly reduced (14-15 €/t)
Mechanized working method: weaknesses

✓ heavy initial investment
✓ higher management requirements
✓ necessity of bigger stands and higher professional skills (specialized manpower)
✓ discontinuity in finding market for chips
✓ needs for work optimization
Productivity trend

- **1950**: Manual
- **1970**: Chainsaw and farm tractor with hydraulic grab
- **1980**: Chainsaw and self-propeller vehicle with hydraulic grab
- **1990**: Felling head and chipper
- **2000**: Harvester, self-propeller vehicles and chipper
- **2006**: Efficiency

**t/d/worker**

- **1950**: 1.6
- **1970**: 5.6
- **1980**: 10-12
- **1990**: 13-17
- **2000**: 24-28
- **2006**: 25-35

(With trees of average weight 0.6 t)
According to a recent research:

- In 2005 plywood industries imported about 30% of poplar wood from France and Belgium; half of it was certified and paid 10% more than the other.

- Certified wood was 10% of the total processed wood.
Certification schemes in Italy

FSC
(Forest Stewardship Council)
586 certified hectares

NO mutual recognition

PEFC
(Programme for the Endorsement of Forest Certification schemes)
2696 certified hectares
Poplar cultivation

ECO

logy

onomy
Proposed initiatives

- **acquisition of detailed and continuous information** (inventory of plantations and researches on operators and companies)
- **improving the image of the sector** and the desirability of the professions involved, to overcome the difficulties related to the generational turnover.

- **planning of the production and consumption** of poplar wood, improving the interaction among the different economic subjects (e.g. through inter-professional contracts in the industry chain);

- **improving communication and marketing**, also showing the positive effects of plantations on the environment and enhancing their ecological value (above all in comparison with alternative agricultural crops);

- **increasing awareness and involvement of the administrative and political bodies** in the problems of the sector.
…thank you for your kind attention!

The end