EcoPêche 2 project
Conceive and evaluate innovative peach orchard management systems designed to reduce pesticide use by 80%


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CTIFL is the French organisation for applied research in the fruit & vegetable sector.

Through its studies and innovations, it contributes to the development and the diversification of production and marketing methods for all actors involved in the value chain.
Peach production: a highly challenged sector

- Strong societal expectations
- No tolerant/resistant cultivars
- Highly competitive market
- Reduction of authorized active ingredients
- Maintain high quality products (sanitary and organoleptic)
- Maintain economic sustainability

Low input peach production challenges
A multipartner project

• 6 partners network
  – CTIFL
  – SEFRA
  – SUDEXPE
  – CENTREX
  – INRAE Avignon
  – INRAE Gotheron

• 2 projects

<table>
<thead>
<tr>
<th>EcoPêche 1</th>
<th>2013-2018</th>
<th>TFI* - 50 %</th>
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<tbody>
<tr>
<td>EcoPêche 2</td>
<td>2019-2023</td>
<td>TFI - 80 %</td>
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* TFI : Treatment Frequency Index, is a phytosanitary products use indicator
Eco+ system objectives

Very ambitious environmental objectives: Use **phytosanitary products as a last resort**

- Reducing TFI by 80% compared to REF
- Non-biocontrol TFI < 4
- 0 pesticides residue
- 0 herbicide use

Maintain **high quality** products

Maintain **economic results**
Materials and methods

A global approach to performances

- Environmental performance and health impact
- Agronomic performance
- Technical-economic performance
Study design

Cultivar: PAJALADE cov, yellow flesh peach
Rootstock: Montclar® Chanturge cov
Date of plantation: 2019

Reference

6 m x 3.5 m
476 trees / ha

Eco +

4.5 m x 2.1 m
1058 trees / ha

Credit ©CTIFL
Eco+ modality: technical choices

**Redesign**
- Rain protection to control brown rot
- Drip system under woven foil to limit humidity
- Woven foil for weed control
- Oblique simple Y to favorize aeration

**Efficiency**
- Tangential flow sprayer to reduce sprayed liquid volume
- Use of a mechanical pruner

**Substitution**
- Mineral oils
- Glue
- Sexual confusion

**Functional biodiversity**
- Floral strips to improve biodiversity
- Glue on trunk

**Physical techniques**
- Thermotherapy
Environmental performances
Phytosanitary product dependency

Non-biocontrol products
(TFI Eco+ vs. REF)
- 20 % 2019
- 76 % 2020
- 93 % 2021

Phytosanitary products per target
- Herbicide: no herbicides
- Insecticide: reduction - 67 % to - 69 %
- Fungicide: reduction - 48 % to - 63 %

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<td>Enviro. Perf.</td>
<td>+</td>
<td>-</td>
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Human health indicators

Pesticide residues test done in 2021 (3rd year) on fruits sampled during the first harvest.

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<thead>
<tr>
<th></th>
<th>ECO +</th>
<th>REF</th>
<th>Maximum residue limits (mg.kg⁻¹)</th>
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<tbody>
<tr>
<td>bosalid</td>
<td>0,0</td>
<td>0,16</td>
<td>5,0</td>
</tr>
<tr>
<td>pyraclostrobin</td>
<td>0,0</td>
<td>0,03</td>
<td>0,3</td>
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• No residues on sampled Eco+ fruits
• Two active ingredients identified on REFERENCE samples
• These molecules come from Signum®, applied twice a year (respectively 27 and 13 days before first harvest) to control brown rot

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<td>+</td>
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Agronomic performances

- Higher yield in 2nd leaf ➔ higher density
- Lower yield in 3rd leaf (for a similar mean fruit weight) ➔ Weakened trees ➔ Higher waste rate level

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Technical-economic synthesis

Marketable yield (t.ha⁻¹) and production costs (€.kg⁻¹)

Production costs closely linked to marketable yield

Labor time (h.ha⁻¹)

Higher labor time on Eco+ ➔ time-consuming prophylaxis

Partial margin (€.ha⁻¹)
partial margin = Turnover – (Labor cost + Input costs excluding infrastructure costs).

A lower partial margin for Eco +, in 2021

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Conclusion

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Environmental objectives reached...

... with agronomic and technical-economic performance depreciated

A on-going project

- Very ambitious objectives
- Next step: find compromises and appropriate cursors levels
- A toolbox for stakeholders
Thank you for your attention

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