



IHC2022, 15 August 2022

International symposium on agroecology and system approach
for sustainable and resilient horticultural production

EcoPêche 2 project

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

J. Ruesch, Y. Montrognon , B. Labeyrie, M. Codini, E. Holstalnou, S. Drusch, J. Borg, D. Plenet, V. Gallia, M. Guiraud, C. Mouiren, P. Blanc.

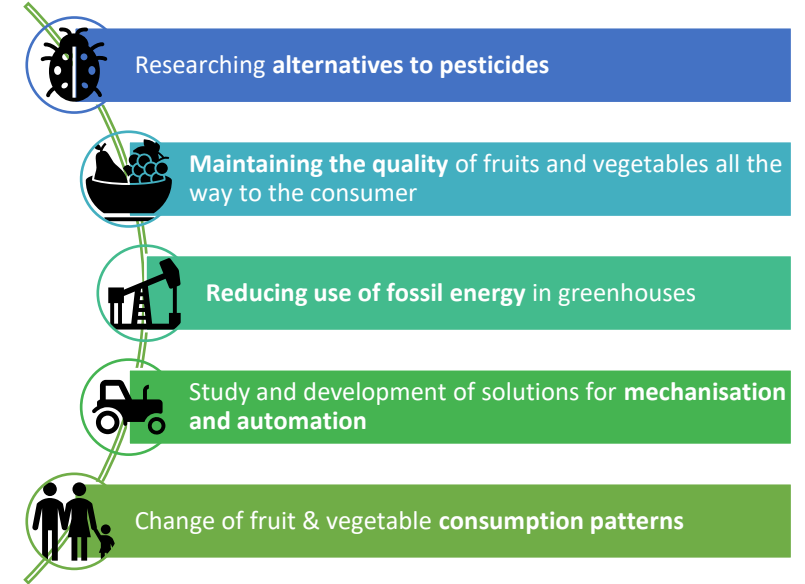
Julien.Ruesch@ctifl.fr



CTIFL : Research, Innovation, Transfer

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**



CTIFL in numbers



6 research themes

17 experts serving as primary contacts for ca. 40 product value chains and coordinating 400 research actions and expertise and valorisation assignments



A 25 million euro budget

of which 54% are contributed by the sector through an extended voluntary contribution (CVE) collected via the inter-trade organisation Interfel



Ca. 40 fruit & vegetable species

covered by research and an expertise extended to 77 vegetable species and 34 fruit species registered in Metropolitan France



1.800 participants

in events organised by CTIFL: information days, national meetings, presentations of varieties



Ca. 11.500 analyses

carried out by the virology and molecular biology laboratory for inspection and maintenance of plant material



281

staff (FTE), including 234 permanent staff and 10 PhD and co-op students



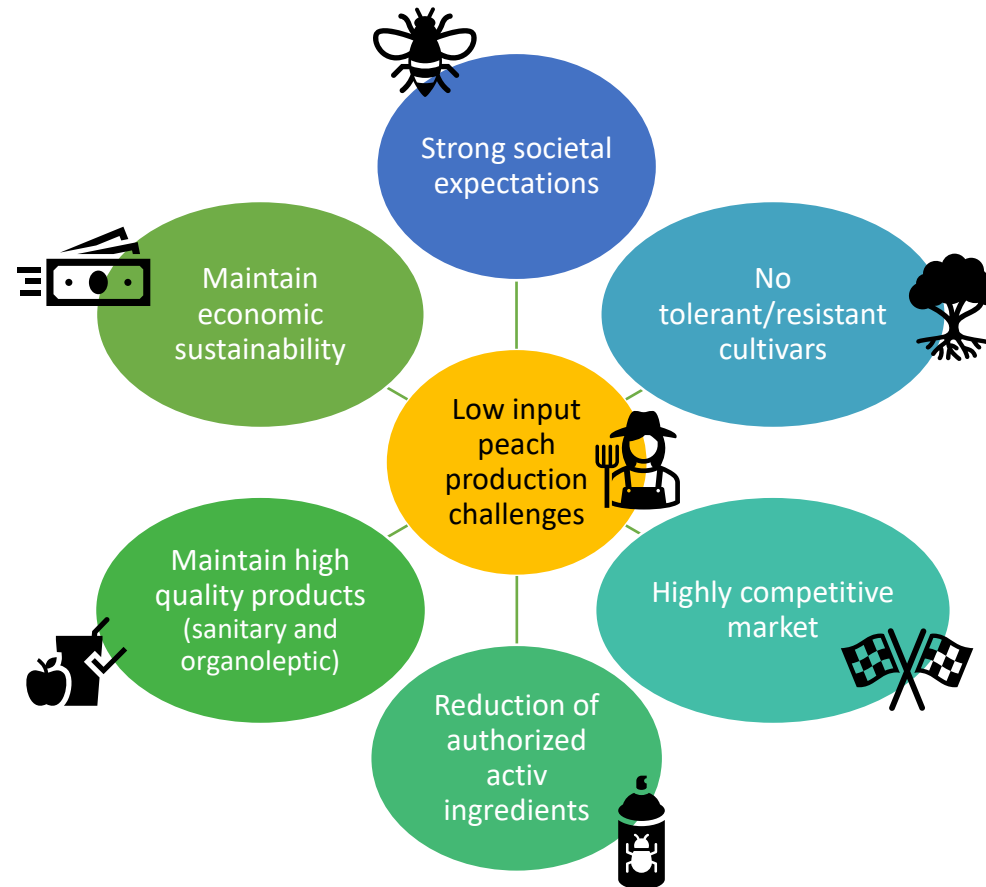
More than 4 million certified fruit plants



Ca. 4.000 visitors

to the CTIFL centres: professionals, students, researchers from other institutes, and officials

Peach production : a highly challenged sector

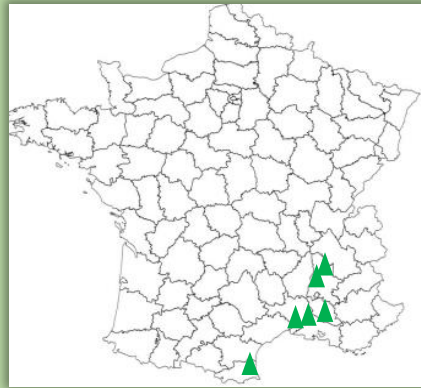


A multipartner project

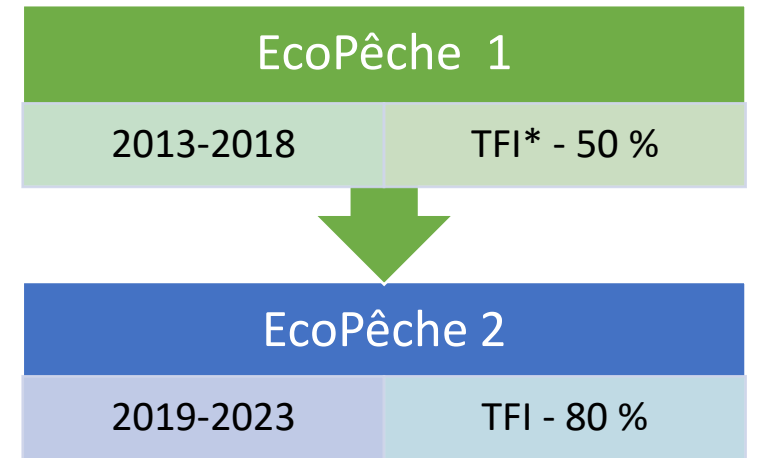


- 6 partners network

- CTIFL
- SEFRA
- SUDEXPE
- CENTREX
- INRAE Avignon
- INRAE Gothenon

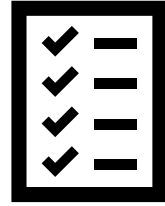


- 2 projects



* 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



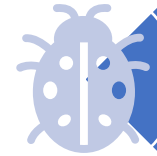
Maintain high quality products



Maintain economic results

Materials and methods

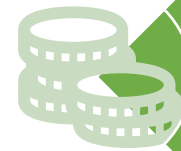
A global approach to performances



Environmental performance
and health impact



Agronomic performance

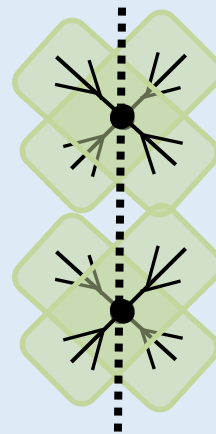


Technical-economic
performance

Study design

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

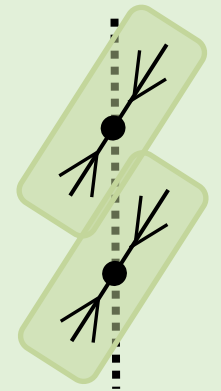
Reference



Double Y

6 m x 3,5 m
476 trees / ha

Eco +



Oblique
simple Y

4,5 m x 2,1 m
1058 trees / ha

Eco+ modality : technical choices

Redesign



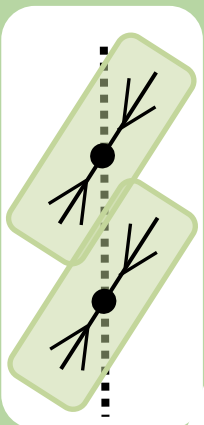
Rain protection to control brown rot



Drip system under woven foil to limit humidity

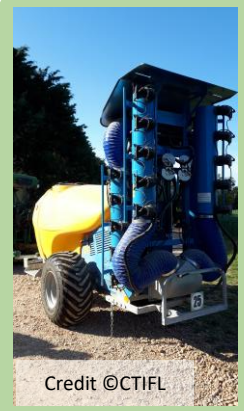


Woven foil for weed control



Oblique simple Y to favorize aeration

Efficiency

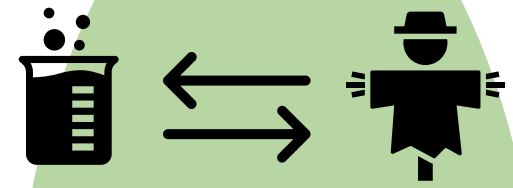


Tangential flow sprayer to reduce sprayed liquid volume



Use of a mechanical pruner

Substitution



- Mineral oils
- Glue
- Sexual confusion
- ...



Sexual confusion



Glue on trunk

Functional biodiversity



Floral strips to improve biodiversity

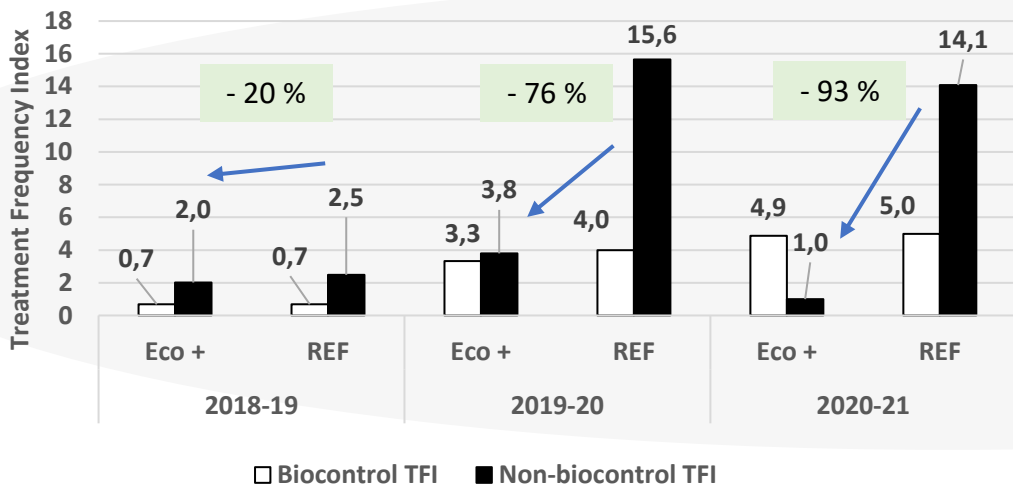
Physical techniques



Thermotherapy

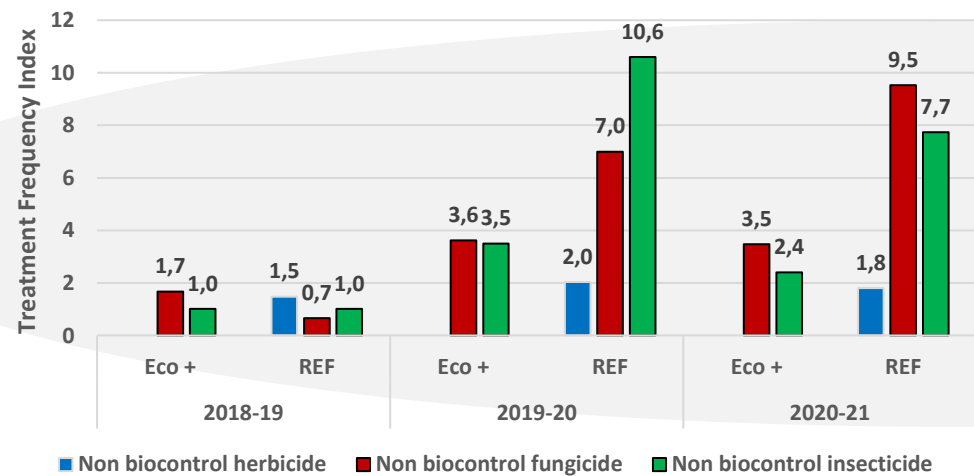
Environmental performances

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%

	Eco +	REF
Enviro. Perf.	+	-

* TFI : Treatment Frequency Index, is a phytosanitary products use indicator

Human health indicators



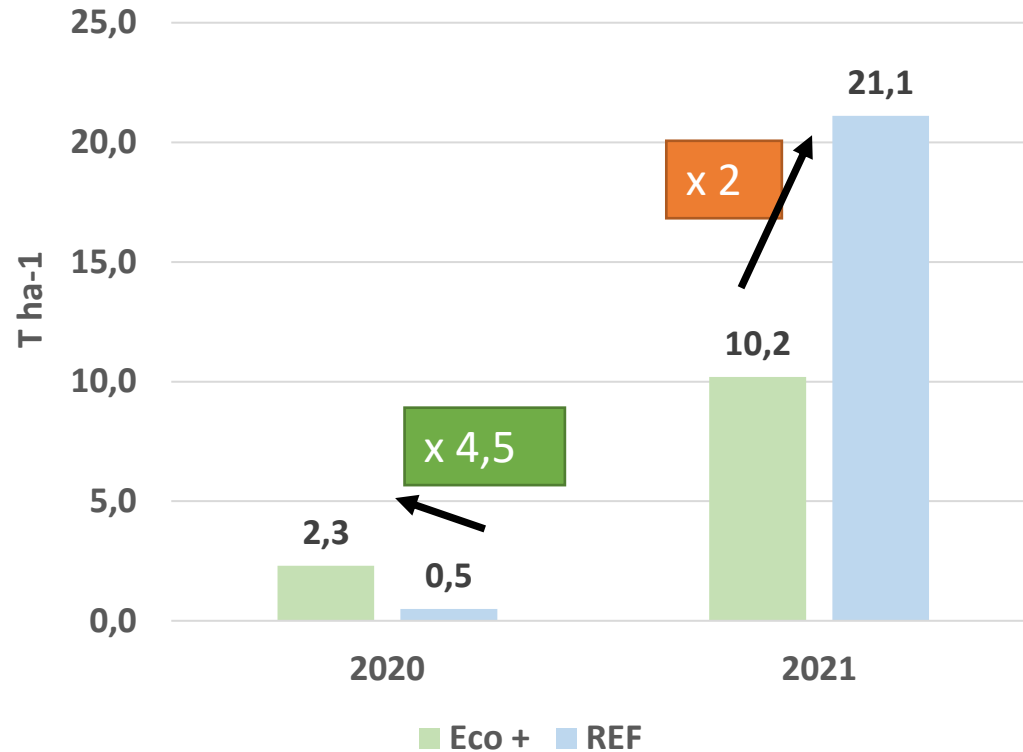
Pesticide residues test done in 2021 (3rd year) on fruits sampled during the first harvest.

	ECO +	REF	Maximum residue limits (mg.kg-1)
boscalid	0,0	0,16	5,0
pyraclostrobin	0,0	0,03	0,3

- 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

	Eco +	REF
Health perf.	+	-

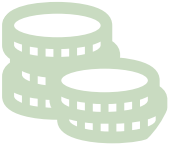
Agronomic performances



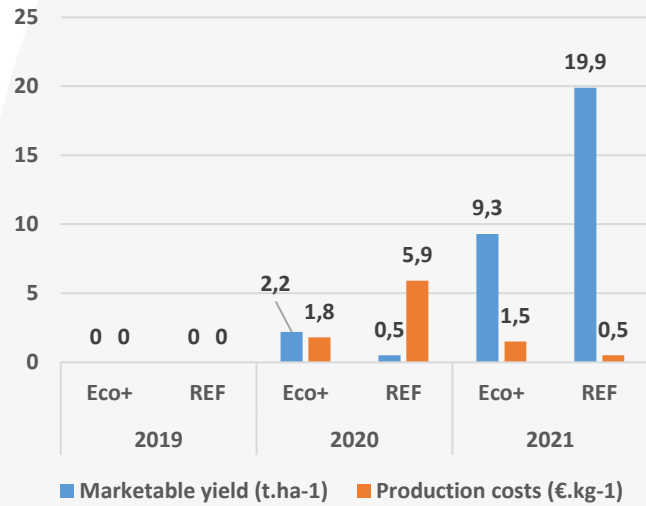
- Higher yield in 2nd leaf
 → higher density
- Lower yield in 3rd leaf
 (for a similar mean fruit weight)
 → Weakened trees
 → Higher waste rate level

	Eco +	REF
Agron. Perf.	-	+

Technical-economic synthesis

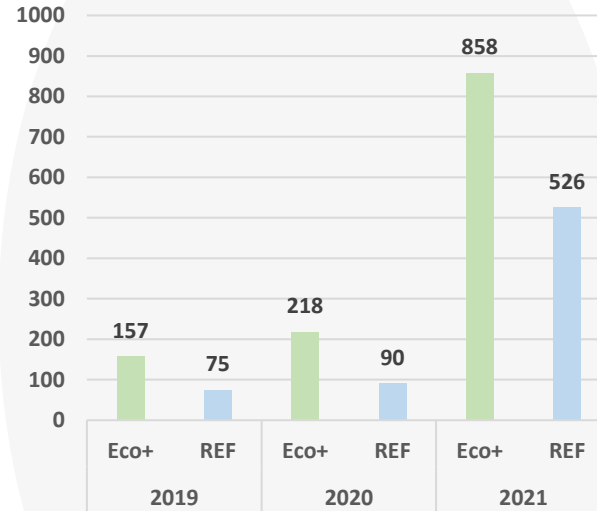


Marketable yield (t.ha⁻¹) and production costs (€.kg⁻¹)



Production costs closely linked to marketable yield

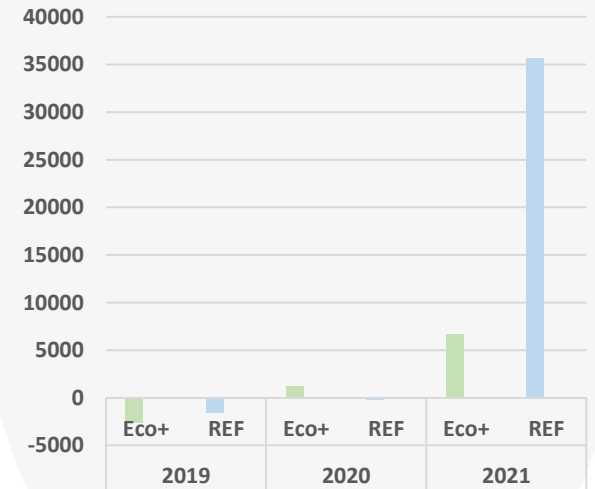
Labor time (h.ha⁻¹)



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

	Eco +	REF
Techn-eco. Perf.	-	+

Conclusion

	Eco +	REF
Enviro. Perf.	+	-
Health Perf.	+	-
Agron. Perf.	-	+
Techn.eco Perf.	-	+

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

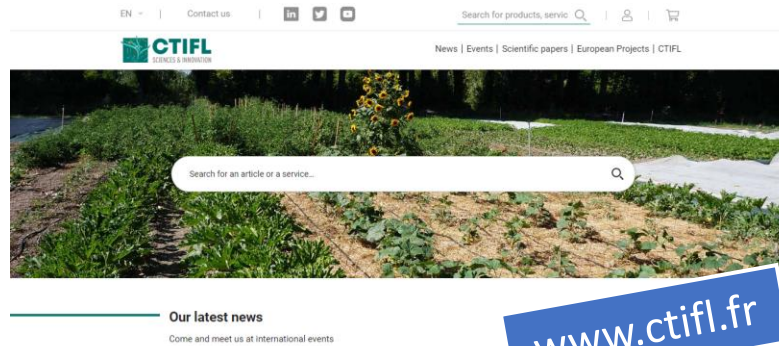


Julien Ruesch
Research engineer

Centre Opérationnel de Balandran
CTIFL • 751 chemin de Balandran – 30127 Bellegarde

julien.ruesch@cifl.fr
www.ctifl.fr

Financial support



www.ctifl.fr



www.ecophytopic.fr

