



Orchard redesign

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² DEPHY EXPE Ecophyto, 2018-2023

<https://www6.paca.inrae.fr/ueri/Contrats-et-projets/Expe-DEPHY-Ecophyto-II-ALTO>



➤ Context and aims

-Need to change intensive specialized orchard systems towards more sustainable fruit production areas

-Aims: To explore how **crop diversification and ecological intensification** through an increase in plant diversity are a way to reinforce ecosystem services and produce in pesticide-free and very low-input systems...



➤ Challenge

To design from scratch a pesticide-free fruit production area relying on ecosystem services, especially pest suppression...



➤ Our partners

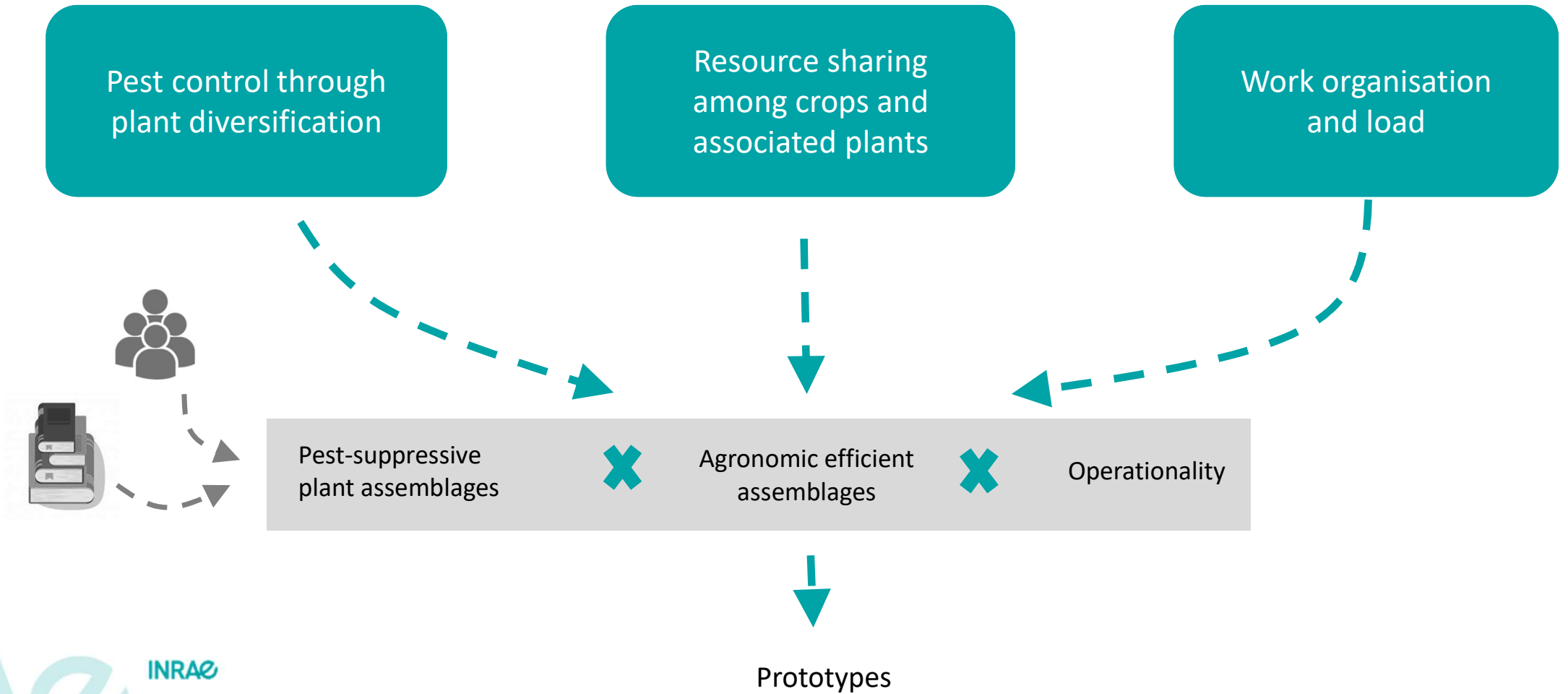


Farmers networks, teachers, advisors, experimentators, researchers (biotechnical and social sciences), naturalists...



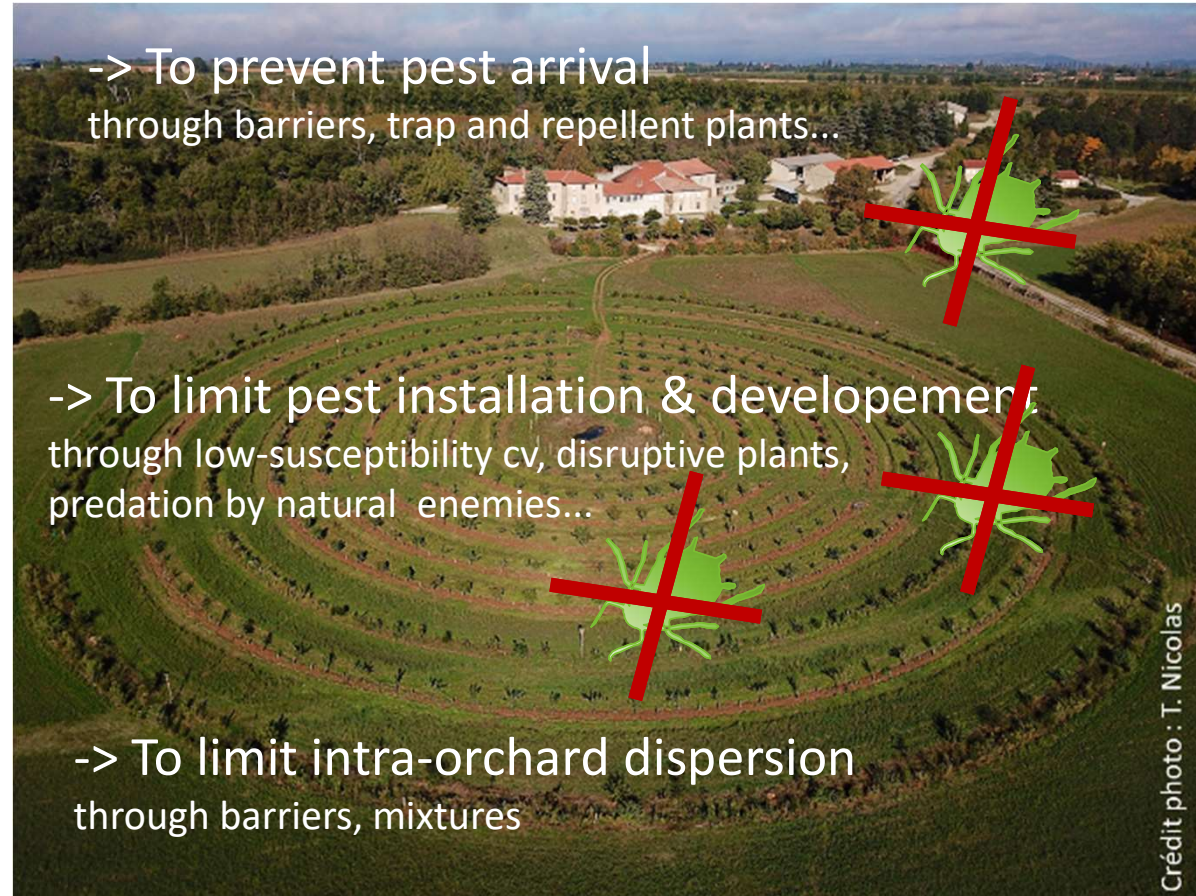
➤ Both an eco- and a co-design experience!

➤ General approach to design



➤ 'Pest suppressive' design: diversification of crops, companion plants, habitats...

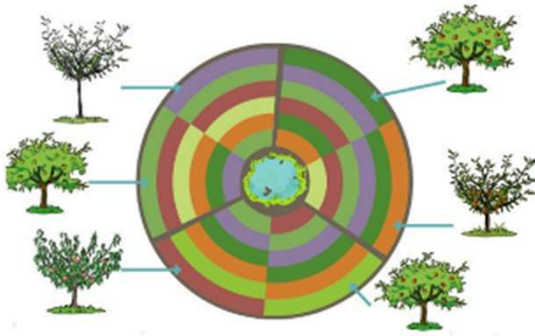
- Planted in February 2018
- 1.7 ha
- Apple trees (50% fruit trees), apricot, peach, plum, fig, soft fruits, hazelnut and almond trees...



To disadvantage pests & diseases and to welcome natural enemies

➤ 'Pest suppressive' design: diversification of crops, companion plants, habitats...

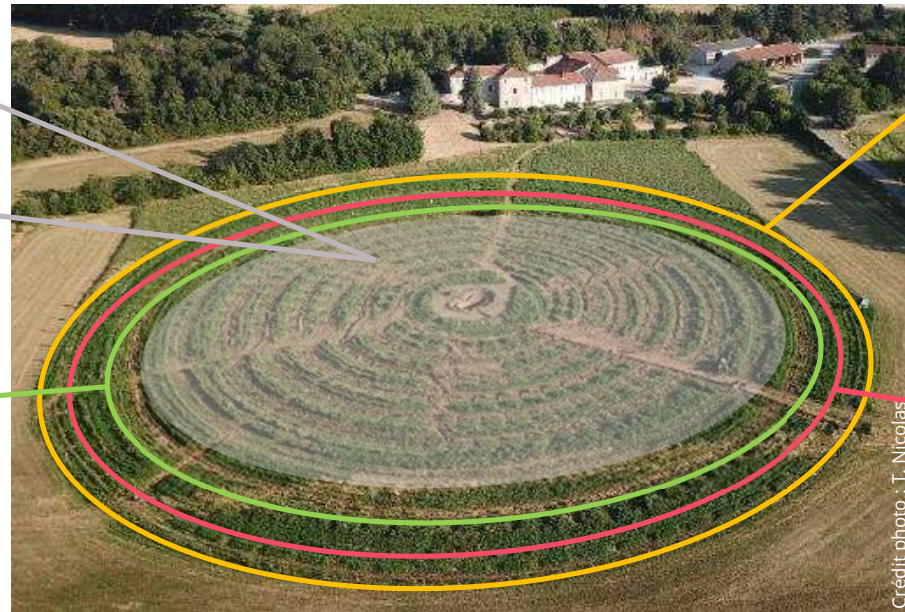
Dessins : © INRA C. Ulirich



General outline ○
Barriers
Trap cv, repellent plants
Low-susceptibility cv

Species (between circles)
and cultivar (within
circles) mixture
Low-susceptibility cv

Barrier: diversified
fruit production circle
(fig, hazelnut, soft
fruit...)

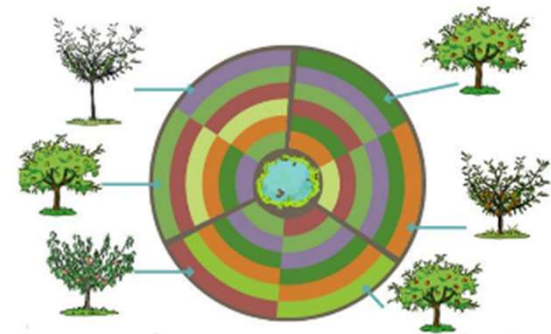


Barrier:
hedgerow
+ windbreak

'Trap' apple cultivars
(e.g., aphid low-
susceptibility cv)

➤ 'Pest suppressive' design : diversification of crops, companion plants, habitats...

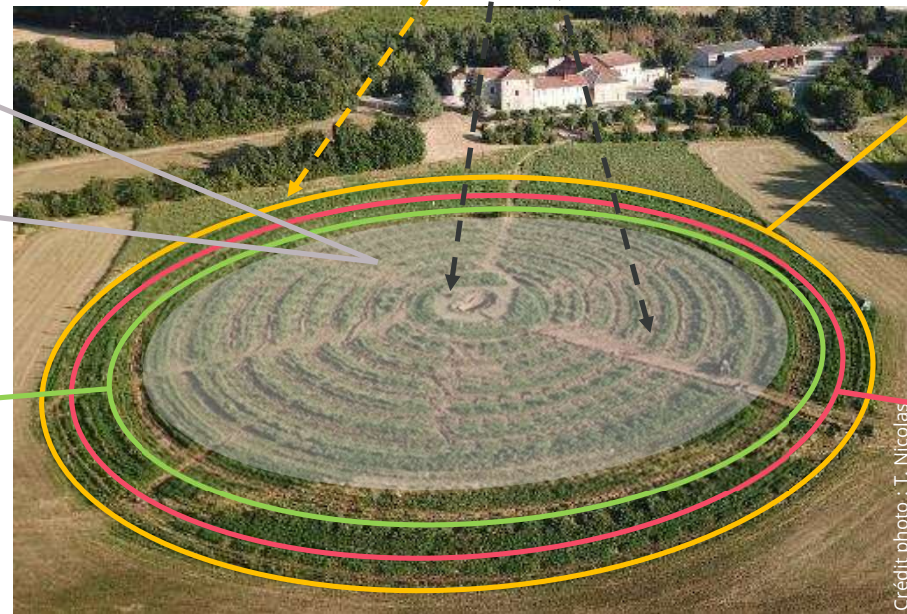
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Conservation biological control : plant

Species (between circles) and cultivar (within circles) mixture
Low-susceptibility cv

Barrier: diversified fruit production circle (fig, hazelnut, soft fruit...)



Barrier: hedgerow + windbreak

'Trap' apple cultivars (e.g., aphid low-susceptibility cv)

Crédit photo : T. Nicolas

➤ A design to assess across time!



Biodiversity

- Abundant and diversified communities and predatory groups
- High predation rates (sentinel preys)
- Pest and disease control varies according to years



Harvest: soft fruit, figs, almonds, first apples



Climatic hazards



Agroecological co-design
-> innovative design and a sharing / learning experience...
but also many questions related to the agricultural sector and the food system!



Thank you for your attention!



For further information

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<https://www6.paca.inrae.fr/ueri/Contrats-et-projets/Expe-DEPHY-Ecophyto-II-ALTO>

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