An approach to study agroecological transitions on diversified farms

Marie DUPRE[1]*, Thierry MICHELS[1], Pierre-Yves LE GAL[2]

[1]UPR HORTSYS, CIRAD, La Réunion, France
[2]UMR INNOVATION, CIRAD, Montpellier, France
*Corresponding author: marie.dupre@cirad.fr

Objectives

Understand to what extent and why do farmers' choices of agroecological practices differ between their crops.

The method was tested on 28 diversified farms.
(Réunion Island, France)

Steps to follow

1. Calculation of a technical score at crop level

The « technical score » (TS) is an indicator of crop ecologization:
- generic: adapted to all crop productions
- inclusive: covering the gradient from all-chemical to all-organic
- simple: compatible with qualitative historical data from surveys

Technical Score = (A – S) Protection
+ (A – S) Fertilization + (A– S) Weed management

A = 1 if at least one alternative practice is implemented, 0 if not.
S = 1 if at least one synthetic input is used, 0 if not.

2. Calculation of the variability of crop technical scores at farm level

The variability of ecologization on a farm is estimed with the gap between the maximum and the minimum crops technical scores.

3. Dynamic analysis of crop technical scores at farm level

The technical scores are recalculated on each date corresponding to a change in practice throughout the farmer's career.

4. Contextualization of crop technical scores with factors on and off the farm

Land allocation and marketing channels are surveyed to understand the respective weights of crops in farm revenue (Dupré et al., 2017).
Cropping constraints are deduced from labour force organization, equipement and specifications.
Technical support and input availability are also explanatory factors.

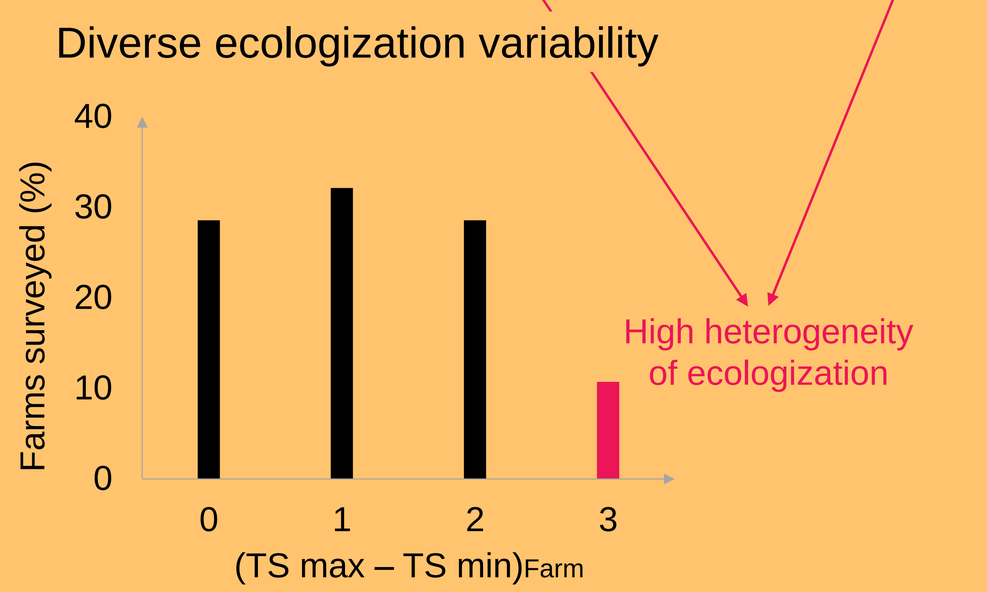
Conclusions

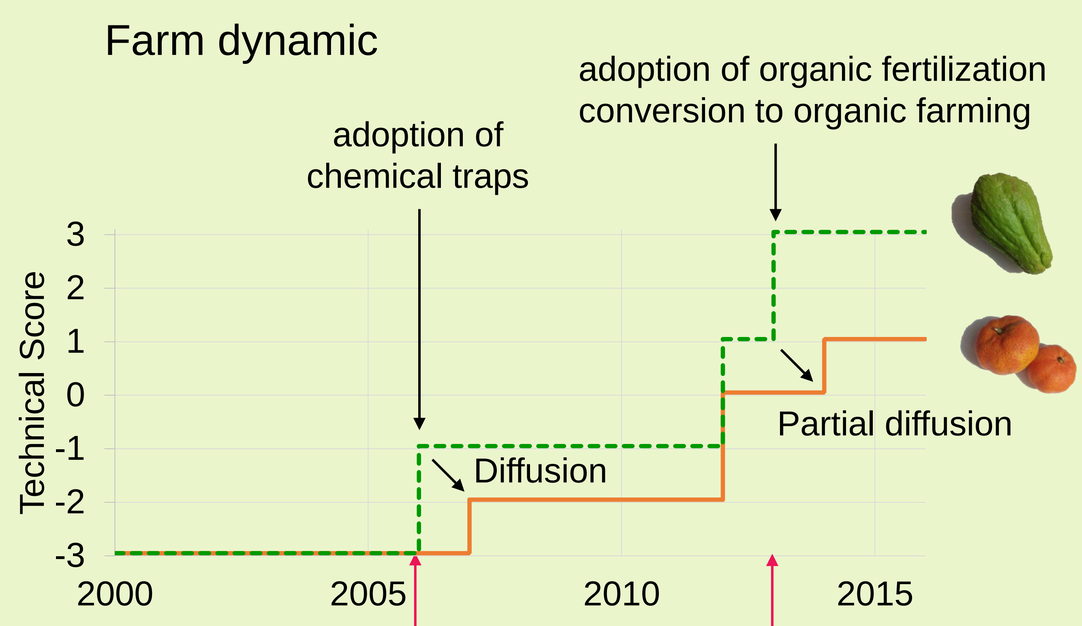
- On a diversified farm, crops can follow diverse ecologization dynamics.
- The contextualized static and dynamic comparisons of crop technical scores on a farm succeeded in explaining these gradual transitions.
- Levers and barriers to agroecological transitions can be deduced from this method and improve political and technical support.

STEP 1 STEP 2 STEP 3 STEP 4

Illustration with a case study

	Christophine	Citrus
Protection	Chemical traps and prevention	Chemical traps, prevention, synthetic pesticides and biopesticides
Fertilization	Imported organic fertilizers	Synthetic fertilizers and local organic waste
Weed management	Mechanical weeding	Mechanical weeding and herbicide spot applications
Technical Score	(1–0)Protection + (1–0)Fertilization + (1–0)Weed management = 3	(1–1)Protection + (1–1)Fertilization + (1–1)Weed management = 0





Understanding farm dynamic

Technical support on Christophine

Development of the organic christophine market

External factors

Internal factors

High revenue:
€ 60 000 /ha

Low revenue:
€ 7 200 /ha

e.g. Understanding fertilizer choice

→ Imported organic fertilizers
Long-term effect but high cost
€ 12,0 /Nitrogen Unit

→ Local blood and bone meals
Low cost but short-term effect
€ 0,1 /Nitrogen Unit

Dupré, M., Michels, T., Le Gal, P.-Y., 2017. Diverse dynamics in agroecological transitions on fruit tree farms. Eur. J. Agron. 90, 23-33.

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