The narrow path of collective appropriation of biological control methods in viticulture: the case of mating disruption

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Context
Synthetic pesticide *versus* biological control methods

Environment and health challenges
- An increasing media pressure in France
- Wine industry and public policy responses
- But the diffusion of biological control methods is rather low
Example of pests

**European vine moths: grape berry-eating larvae**

*Eupoecilia ambiguella* (Hübner 1796) Cochylis

*Lobesia botrana* (Denis & Schiffermüller 1775) Eudemis

Credit: BASF 2014
The mating disruption as a biological alternative

**Principle**

Insects are disturbed during the reproduction phase by a technique based on a natural principle saturating the air with pheromones and making the males unable to recognize the females.

**Coverage**

4% of French vineyards treated with MD (BASF data)

**Issue**

Which are drivers of the MD in French vineyards?
Background

Techno-organizational trajectories: two main explanations

Trajectory

Innovation

Regulation

Individual/Collective learning
Hypothesis: treatment substitution

Vine leafhopper: Flavescence dorée bacteria vector

*Scaphoideus titanus* (Ball 1832)
Flavescence dorée

- Chemical treatments decided by government offices
- Similar development period of larvae: treatment quite effective against European vine moths larvae

Credit: BASF 2014
Hypothesis: individual/collective dimension

<table>
<thead>
<tr>
<th>Coordination</th>
<th>10 hectares plots without any discontinuity: geographical proximity</th>
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<td>Learning</td>
<td>learning by doing and by interacting: the role of organizational proximity</td>
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Hypothesis
Regulation and Collective factors
Data
A national mail survey to retrace the techno-organizational trajectory of wine farmers using MD

Population
Winegrowers from Bordeaux, Champagne, Val de Loire, Languedoc, Charente, Rhone/Provence valley and Burgundy

Sampling
531 wine firms using MD or not

Period
2000–2012
Data
The techno-organizational trajectory of wine farmers using MD retraced

12 wine years: FD and MD treatments

+ General information: designations of origin, networks, environmental approach
+ Motivations and obstacles
+ MD knowledge test
+ MD efficacy evaluation
Results

The influence of regulation

$\chi^2$ tests: significant dependence between the non use of MD and the obligation to spread against FD vectors

Competition between the regulation and the objective to reduce pesticide use given by the same governmental offices
Results
The influence of the collective dimension

MCFA: a collective dimension expressed in two ways
Training and institutionalization
Two main points

- The collective management of MD is one of the key-point of the diffusion of the method (through neighborhood but also learning process, council and drivers for the starting)
- A complete overview of regulations and potential interactions with innovations may be useful.
Outlook

To focus on interaction between regulation and individual/collective local dynamics
Thanks for your attention