

ASSESSMENT OF GROUND COVER CROPS IN A TEMPERATE ORGANIC ORCHARD

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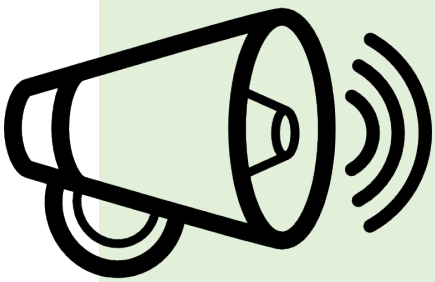
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WHY ?

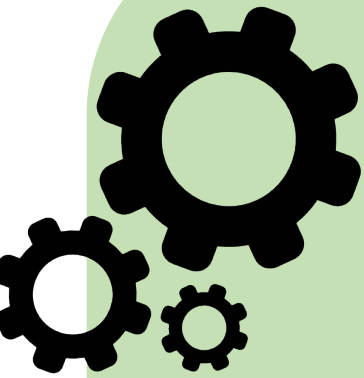


In orchards, ground cover management based on tillage or cover-crop destruction has several drawbacks:

- use of non-renewable energy
- disruption of habitat for natural enemies of pests
- disturbance of superficial root development and soil properties
- increase of erosion

→ To identify alternatives in ground cover management, we assessed 8 cover crops during 3 years and quantified their soil covering capacity.

HOW ?



An experimental design ...

South-East France
Organic peach orchard
Sandy loam soil
Planted: 1999 ; density : 4 x 5m

1 treatment: 6 trees x 3 rows

Cover-crops were

- sown manually
- within the row
- in spring 2014
- irrigated (microjet®)
- mowed (3 times/2014 ; 2 times/2015 ; 1 time/2016)

... composed of Fabaceae and Poaceae, combined according to their expected services...

Nitrogen release

Trifolium repens
Trifolium pratensis
Medicago lupulina
Lotus corniculatus

Fast covering capacity

Trifolium repens
Medicago lupulina
Hordeum vulgare

Dwarf canopy

Trifolium pratensis
Medicago sativa

Clumpy development

Festuca ovina
Festuca rubra

... and interspecific complementarities in time and/or space ...

... resulting in 8 treatments ...

N°	SPECIES AND SEED RATE (kg/ha)	
1	<i>Trifolium repens</i>	20
2	<i>Medicago lupulina</i>	30
3	<i>Trifolium pratensis</i>	22
4	<i>Trifolium repens</i>	10
	<i>Festuca ovina</i>	30
5	<i>Medicago lupulina</i>	15
	<i>Festuca ovina</i>	30
6	<i>Trifolium pratensis</i>	11
	<i>Festuca rubra</i>	18
7	<i>Medicago sativa</i>	27
	<i>Hordeum vulgare</i>	100
8	<i>Medicago lupulina</i>	8
	<i>Lotus corniculatus</i>	4
	<i>Trifolium repens</i>	3
	Others	<0,5%

... such as:

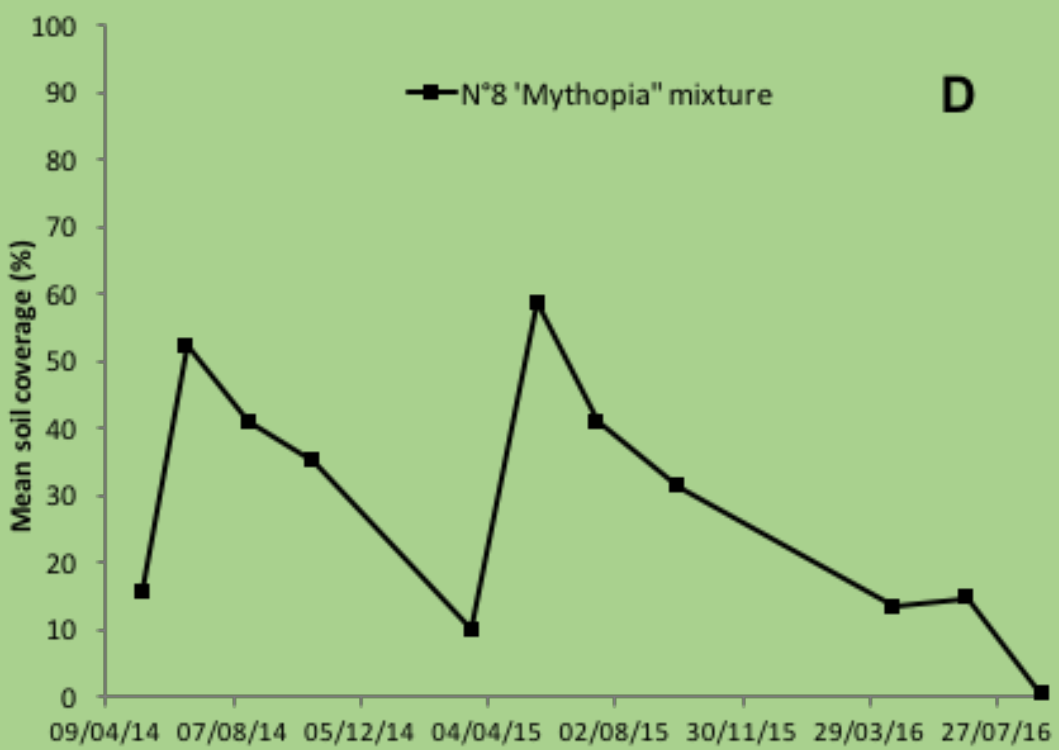
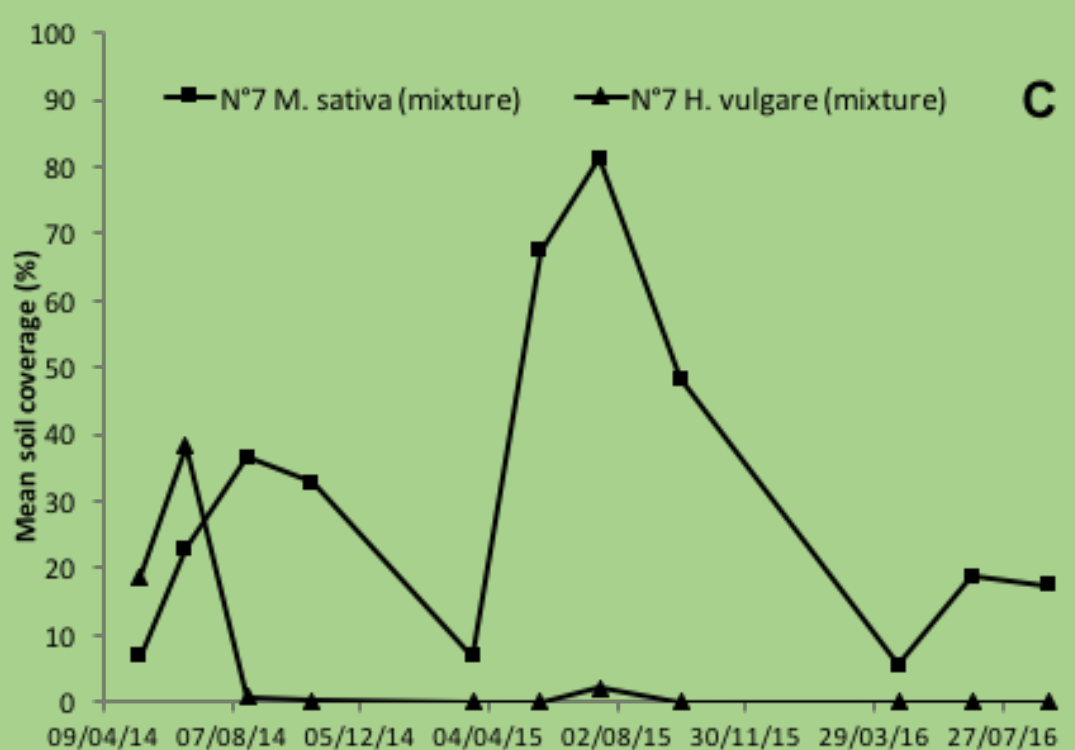
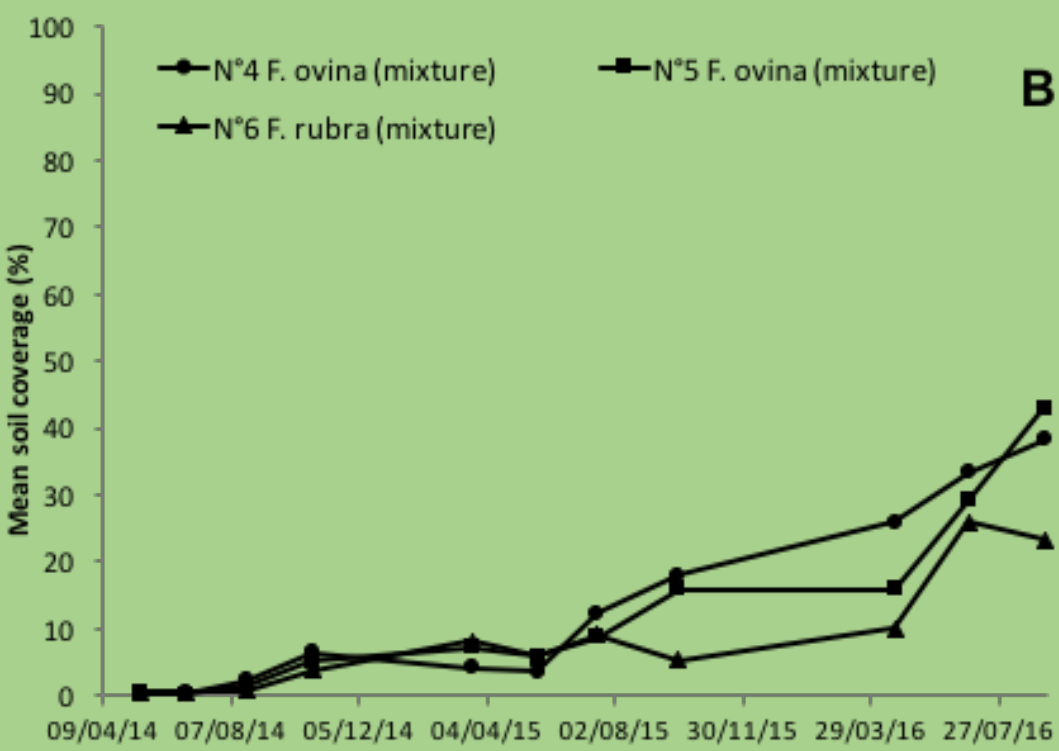
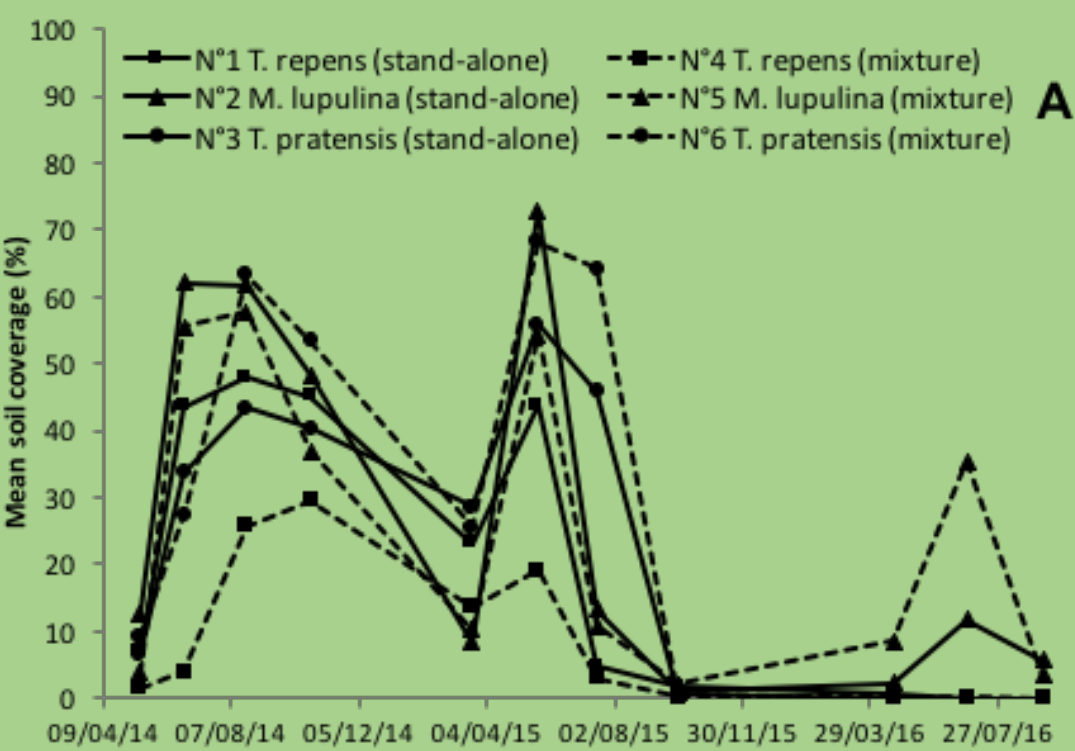
Trifolium pratensis and *Festuca rubra* within the tree row – April 2015



WHAT ?



Mean soil coverage of the 8 cover crops tested during 3 years



IN A NUTSHELL

- ✓ No effect of the botanical composition of cover crops on weed composition observed
- ✓ (A) **HIGHEST RATE** of ground coverage observed: *M. sativa* (81±22%), *M. lupulina* (73±21%), *T. pratensis* (68±23%) and *T. repens* (48±22%),
- ✓ (A) **BETTER IN MIXTURE**: ground coverage of *T. pratensis* was higher when it was grown in a mixture (N°6) than as stand-alone (N°3) despite a lower sowing density in the mixture >> *complementarity in space*,
- ✓ (B) **A SLOW BUT STEADILY** ground covering capacity of both *Festuca* sp., very clumpy development: no weed development observed in *Festuca* sp. clusters,
- ✓ (C) **A GOOD TEAM**: *H. vulgare* (annual) disparition offset by *M. sativa* development (perennial) since the second year after sowing >> *complementarity in time*,
- ✓ (D) Ground coverage of the mixture in treatment n°8 reached 52±33% and 59±32% respectively in 2014 and 2015,
- ✓ **A CRUCIAL MANAGEMENT OF COVER CROPS MOWING** since it strongly affects their long term ground covering capacities.

THANKS !

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COVER CROPS AS A CONTRIBUTION TO WEED CONTROL AND BIODIVERSITY PROMOTION

AIMS OF PLACOHB PROJECT

- ✓ Develop a methodology for **selecting ground covers**
- ✓ Define of a range of efficient ground cover plants according its use: on the row, at the edge of the plot ...
- ✓ Define **installation** (sowing, planting) and **management** procedures (mowing, etc.)
- ✓ Define the **impacts of ground cover** on productions
- ✓ Create **dissemination and educational tools**

PARTNERS



PLACOHB in a nutshell

- ✓ 2017-2019
- ✓ 16 French partners
- ✓ Systems concerned: fruits, vegetables, grapes, nurseries, aromatic and medicinal plants

MORE INFORMATION

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- ✓ Dissemination : Claude-Eric Parveaud : claudeeric.parveaud@itab.asso.fr

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