

# ISARA Lyon Field Trials - France

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## Long-term Experiment :Thil

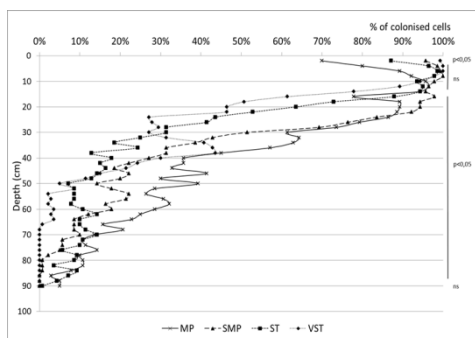
**Description:** Field experiment to adapt reduced or no tillage to organic grain system on a irrigated sandy soil.

Experiment started in 2004. Four tillage are compared : Plough at 30 cm depth (MP), Shallow plough at 18cm depth (SP), Reduced tillage with chisel at 15 cm depth (ST) and Very superficial tillage (5 cm)/direct seeding with crimper roller (VST/NT). **Crop in 2015: winter wheat**

### Main results



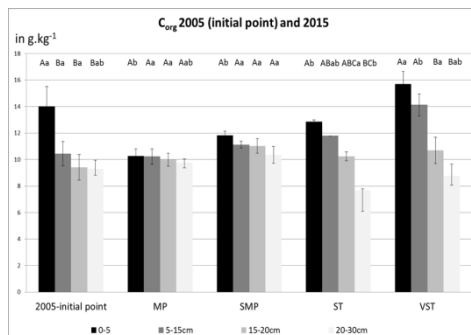
**Figure 1:** Photos of the soil structure obtained under the 4 tillage treatments with the spade test-May 2015



**Figure 3:** % of cells colonised by winter wheat roots for the entire soil profile – counted in the 4 tillage treatments in May 2015

There is few difference between treatments in terms of soil (cells of 4 cm<sup>2</sup>) colonized by roots in the first 12 cm of soil profile. From 12 to 90 cm depth, treatments without ploughing (VST and/or ST) present less roots than with ploughings (Figure 3).

Soil structure is more compacted with very superficial tillage compared to the 3 others treatments (Ploughing, Shallow ploughing and Superficial tillage). As illustrated on figure 1 with spade test, soil compaction occurs mainly in soil layer not worked. These results have been confirmed with soil profile description and penetration resistance measures.



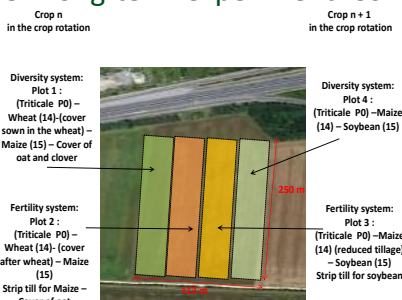
**Figure 2:** Organic Carbon (Corg) in g.kg-1 at the beginning of the experiment (2005-initial point) and of the 4 tillage treatments from 0 cm to 30 cm depth in May 2015.

Different letters: (A,B,C) means that values between soil layers for a same treatment are statically different (p.value<0.05) and (a,b) means that values between treatments for a same soil layer are statistically different ( p.value < 0.05)

Corg content stratification, from high Corg at soil surface to lower Corg in depth, is clearly measured with very superficial tillage, with higher Corg in the soil layers from 0 to 15 cm depth compared to soil layers from 15 to 30 cm depth (Figure 2). This effect is less clear with superficial tillage.

More weeds in ST and VST compared to MP and SP. at the end of winter, no difference at flowering stage  
No treatment effect on the winter wheat yields

## New long-term experiment: Corbas



**Figure 4:** Field experiment in Corbas – Comparison of 2 cropping systems in OF : Diversify system and Fertility system

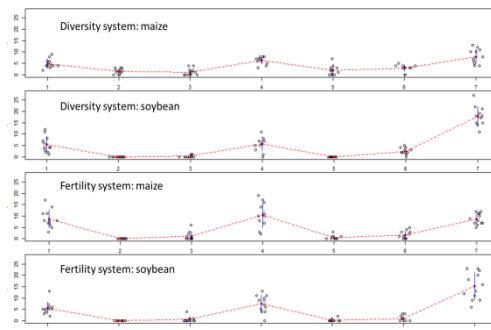
### Main results on slugs and generalist predators:

• Spring 2015 was very dry; few slugs were trapped per plot.  
The density-activity of the generalist predators is more influenced by previous crop and green manures than by the cropping systems : with more generalist predators on the maize after a winter wheat + green manure (maize) than on the soybean after a maize and no green manure

**Description:** Field experiment to assess the effects of 2 cropping systems in Organic Farming on soil quality, biodiversity and crop performances.

Experiment started in 2013. Two cropping systems are compared (Figure 4):

- “Crop diversity”: diversified crop rotation, cover crops, intercrops
- “Soil fertility conservation”: minimal soil disturbance, crop rotation and cover crops



**Figure 5:** Density activity of the generalist predators (carabidae + staphylinidae + araneae) in spring 2015 (7 weeks). Pit-fall trap methodology – 12 pit fall traps per plot  
Red line: mean of the density-activity of the generalist predators per date