

## Valorising European Research for Innovation in Agriculture and Forestry



### VALERIE Stakeholder Trials:

#### Cover crop experiences of farmers in Alessandria, Italy

##### The problem

Due to a lack of livestock and organic matter input into fields, local soil fertility is slowly decreasing in many parts of Alessandria county. In order to obtain more consistent yields and quality, most of the farmers apply mineral fertilizers to their land that can only have a limited effect on soil organic matter through increasing productivity. Farmers need cheap solutions to increase soil fertility in the long run and increase the sustainability of the agricultural system. Unlike other countries, farmers are not obliged to use cover crops in Italy, and during winter, many fields are left uncovered and exposed to rainfall, frost and wind. While this helps to break up lumpy, clayey soils, it impoverishes their nutrient content.

##### The proposed solution

Cover crops or catch crops can be a good solution to this problem for farmers, especially after winter wheat that is followed by any other spring crop, such as maize (corn) or processing tomato. Cover crops have to be sown by the beginning of autumn, when the first rainfalls are available and they have to develop in the period up to the early spring. The earlier they are sown, the more growth. Ploughing or other soil tillage (harrowing) can be performed during spring, when needed.

##### Stakeholders

The issue of soil fertility was raised by the wheat supply chain farmers during initial discussions in the project. Soil quality is slowly decreasing throughout the county and special product applications (such as amendments or compost) are too expensive. Many of the farmers were unaware of, or did not consider, cover crops as a solution. It was important that through the Valerie project, the farmers could experience the use of cover crop in their fields and on their soils and understand the feasibility of this practice.





### Aims and Method

This field demonstration operated at the farm level with the aim of allowing farmers to try this innovation in their fields and to experience the practical management aspects in relation to sowing, managing and burying cover crops. Since it is very difficult to measure the effect of the cover crop in its natural condition, and it is even more complicated when performed directly on the farm, no measurements or analyses were attempted. What counted most was to collect stakeholders' impressions and reactions to this innovation. The trial will be continued into the winter of 2017 in order to allow more farmers to be involved and experience this practice.

## Results



Regarding the first experience with cover crops we have observed that:

- The sowing technique can vary farm to farm, depending on availability of either the sowing machine or the fertilizer spreader. Seed mixes can be tricky and can lead to uneven sowing in the field, since smaller seeds can follow first while the larger ones tend to stay in the tank.
- It requires at least a minimum tillage. In fact, it is better to cover the seeds with a minimum amount of soil to help sprouting and protect them from insects and birds. A sod seeding sowing machine can be used. If the fertilizer spreader is used for sowing, it is advisable to disk harrow first.
- Sowing period is the key factor for a successful cover crop. For our area, the period after the harvest should be avoided because of hot temperatures and dry conditions. It is advisable to sow the cover or catch crop at the same time as rapeseed or rye grass, which means by early October at the latest.
- The type of soil can influence the use of cover crop. In fact, lumpy and clayey soils can benefit from a late summer ploughing (rather than cover crops) followed by cold and rainy winters that help loosen soil particles and improve the structure.
- The amount of biomass produced by the cover crop can vary from sowing date and the selected species. Brassicaceae and grasses are good organic matter producers, while legumes help fix nitrogen.



In 2016, two species were trialled: *Sinapsis alba* (White Mustard) and *Vicia villosa* (common vetch) in seven farms, as listed in the table.

The trial will continue into the winter of 2017 and the farmers will receive two different seed mixes instead of pure seed species. Mix A comprises mustard, radish and daikon, while mix B contains oats, vetch and brassicae.

The trial will be run in the same way as the previous year.

Farm ID	Location	Vetch - hectares	White Mustard - hectares
A	Bosco Marengo	3	3
B	Pozzolo Formigaro	2	3
C	Pozzolo Formigaro	3	-
D	Alessandria	-	9
E	Quargneto	4	-
F	Predosa	5	10
G	Predosa	3	6
	<b>Total</b>	<b>20</b>	<b>31</b>

## Overall stakeholder involvement and feedback

Stakeholders were asked to try the mixes in their own fields especially after wheat. Some of them were really interested and enthusiastic about the experience, while others were less so. So far, the benefits of this solution will not be visible until the next crop year. We are planning to set up a trial in our experimental field to show in 2019 the effect of the use of cover crops.





## Key findings

- Cover crops can represent a good opportunity to increasing soil fertility in the Alessandria agricultural area but the normal practice needs to be adapted to the local situation;
- The choice of the species or the mix can influence the final results;
- It is important to sow the cover crops at the right time. The best period is between September and October, before wheat sowing.



## Further reading

VALERIE trial leaflet: Sampling for quality assessment and improvement for a wheat supply chain in Alessandria, Italy

VALERIE trial leaflet: Evaluation for biostimulants in the bread wheat value-chain, Alessandria, Italy.

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