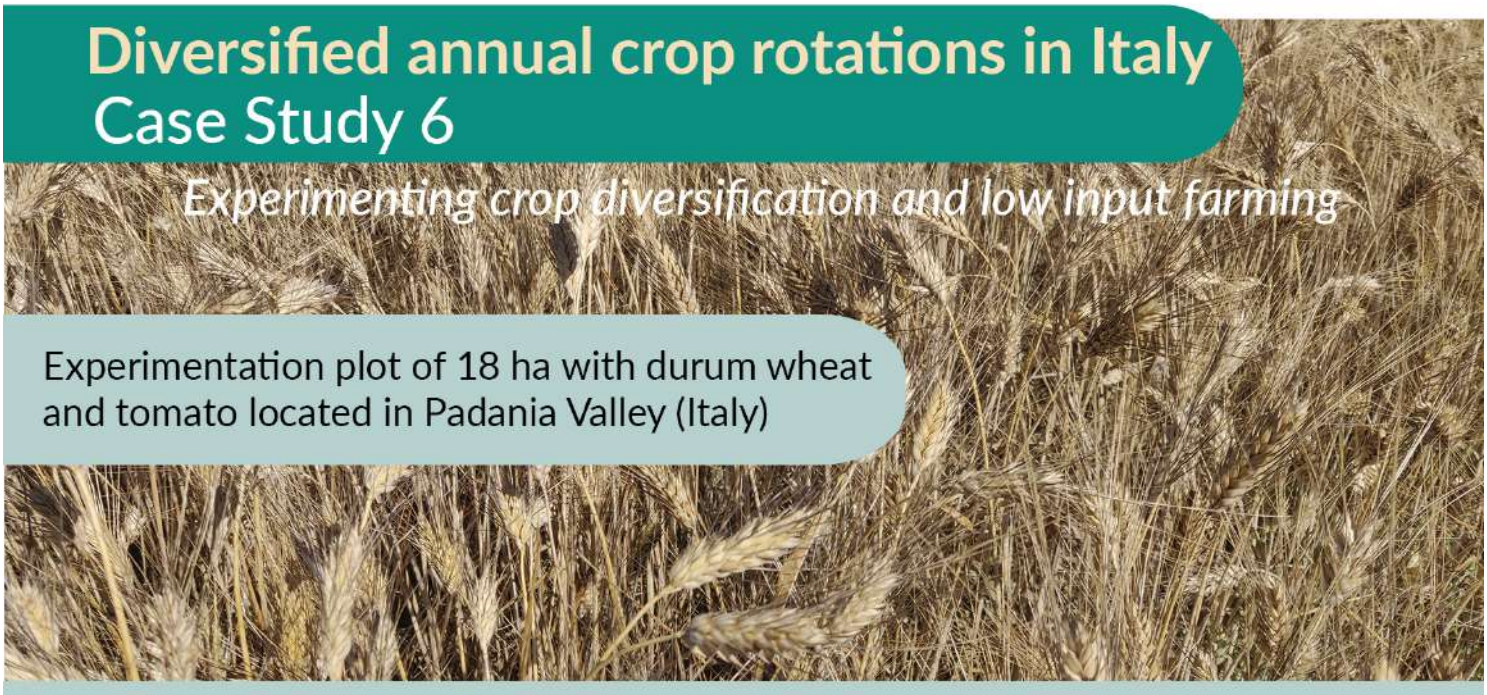
Diversified annual crop rotations in Italy
Case Study 6

Experimenting crop diversification and low input farming



Experimentation plot of 18 ha with durum wheat and tomato located in Padania Valley (Italy)

Improving the intensive arable durum wheat - tomato rotation, common land use in the area. The diversifications included are:

1 **Introduction of a leguminous crop in the rotation (pea for food)**

2 **Introduction of tomato as second crop after pea (multiple cropping)**

*The diversified rotation is tomato, wheat, pea/tomato

\+ **Use of digestate as an amendment and integrated pest management**

\+ **Multi-year and multi-crop contracts with allocation guarantee, crop insurance schemes, technical support for the pea cultivation**

AGRONOMIC BENEFITS

1. Double yield
2. Workload and risk of soil compaction reduction
3. Increase in land productivity

ENVIRONMENTAL BENEFITS

1. Increase in functional agro-biodiversity
2. Available Phosphorus in soil increased in all plots
3. Diversification significantly reduced the content of total copper and cadmium

SOCIOECONOMIC BENEFITS

1. The economic performance is influenced by the yearly climatic trends and by the quality of the products that have a different market price

2. Most years the gross margin was higher in the diversified systems than in the current management of the farmer

3. The higher profitability of diversified systems is due also to the contractual component that covered the failures in crop's yield

WHY IMPLEMENT CROP DIVERSIFICATION?

The proposed diversification has shown to have maintained or increased the grossmargin for the farmer and to improved the general environmental performance.

The overall results confirm that public policies must continue to support the transition from highly specialised to diversified systems, responding to social demands, looking at the citizens and rewarding agri-food operators

AGRONOMICS DRAWBACKS

1. **High variability of productivity** for all the crops in the rotation
2. Risk due to reduced timing for soil, planting and seeding operation
3. The technical knowledge a farmer needs to pass from a simplified cereal-based system to a diversified system

ENVIRONMENTAL DRAWBACKS

1. **No positive effects were observed for microbial biodiversity**, but this probably requires a longer time to be detected.
2. The use of irrigation for tomatois foreseenin the diversification

SOCIOECONOMIC DRAWBACKS

1. **The technical problems of growing tomato** as second crop in a very short cycle (under 4 months) can negatively affect the overall gross margin result
2. The re-design of the farms devoted to agri-food production transition costs and to manage the risks due to "unknown" crops and their market

FINAL CONCLUSION

The rotation allowed to increase the gross margin for the farmer, essentially because in three years there are four crops and four different products to be sold. The use of digestate was positive for the soil quality, increasing the total nitrogen supply, , allowing to reduce the mineral fertilizers supply. It is also a clear example of the circular economy

HORIZON 2020

DIVERFARMING