

Durum wheat in Italy

Long Term Experimental Plot 2

Experimenting crop diversification and low input farming



Experimentation plot of 1.2 ha with durum wheat and tick bean located in Foggia (Italy).

MANAGEMENTS COMPARED WITHIN THIS CASE STUDY

Conventional tillage (CT) with mouldboard ploughing and no tillage (NT)

Monocropping of durum wheat (CDW) versus two years rotation durum wheat-faba bean as covercrop (FB/DW)

AGRONOMICS BENEFITS

1. In CDW or FB/DW cultivation systems, no-tillage shows no adverse effects on production
- 2.. The introduction of rotation together with residue management compared to the monocrop system has improved the performance of durum wheat for all the parameters analysed in NT whilst only some parameters have improved in the CT treatment

WHY IMPLEMENT THESE MANAGEMENT PRACTICES?

Apulia is the first region in Italy for surface area and production of durum wheat. This condition is favorable because the no-tillage system can expand favourably with large and positive environmental and economic effects



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ENVIRONMENTAL BENEFITS

1. Since the difference between NT and CT treatment is insignificant in the CDW cultivation system while in the FB/DW rotation it would seem more favorable for NT, it would be desirable to encourage no-tillage management, especially in the Mediterranean environment
2. The NT management would considerably reduce the fossil fuel consume and consequently the production of CO₂ with significant aspects on the containment of the greenhouse effect
3. NT management combined with the crop rotation, using the leguminous as cover crop, and the residues management would counteract with greater intensity the wind and water erosion as well as the soil water evaporation, and would favor the accumulation in the soil of organic C and N, the soil microbial activity and the soil productive potential.

AGRONOMICS DRAWBACKS

1. The No Tillage system can not be adopted for all cropping systems, especially intensive ones
2. The No Tillage adoption requires a farm machinery fleet substantially different from the conventional one and therefore the funds availability, mainly public, that is often lacking in the agricultural sector.
3. Weed control in the No Tillage system is a serious problem that should possibly be dealt with by agronomic means rather than the use of chemicals.

ENVIRONMENTAL DRAWBACKS

1. For reasons of environmental protection and saving of natural resources, the impact due to conventional agricultural systems should be as limited as possible.
2. Soil tillage as well as excessive depth make the soil more vulnerable to wind and water erosion, especially in sloping soils, increasing both social and environmental costs.
3. Soil tillage by exposing organic matter to air and solar radiation facilitates the oxidation process by promoting the release of CO₂, and other greenhouse gases, into the environment and the increase in atmospheric temperature.

FINAL CONCLUSION

The No Tillage system is an agronomic technique, especially in extensive agricultural systems, by now consolidated that can be adopted without significant reduction in yields and grain quality. On the contrary, the CT system should be limited in the tillage depth to reduce the problems due to the soil erosion and loss of soil organic matter



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