

Rainfed almond orchard in Spain

Long Term Experimental Plot 3

Experimenting crop diversification and low input farming



Experimentation plot of 0.050 ha with 53 almond trees located in Murcia (Spain).

Prior the Diverfarming experimentation it was a rainfed conventional permanent monocropping system for food. It is an organic system, with no fertilisation.

3 MANAGERMENTS EXPERIMENTED WITHIN THIS CASE STUDY

CONVENTIONAL TILLAGE

REDUCED TILLAGE

REDUCED TILLAGE WITH GREEN MANURE

WHY IMPLEMENT THESE MANAGEMENT PRACTICES?

Our results highlight the potential of reducing tillage frequency and intercropping almonds with green manure as a feasible strategy for climate change mitigation in semiarid Mediterranean conditions



DIVERFARMING

MAIN BENEFITS

AGRONOMICS

1. Increase of the main **crop yield** in the long-term
2. Potential **second crop productivity**
3. **Improvement in the availability of nitrogen** (ammonium and nitrates) and water availability for plants



ENVIRONMENTAL

1. Significant **reduction in interrill erosion and loss of carbon and nutrients** mobilised in the sediment (by 85%).
2. Improvement in soil structure and **soil fertility**
3. Contribution to **climate change mitigation** through the soil organic carbon stabilisation and modulation of the CO₂ fluxes to drastic changes in soil temperature and moisture

MAIN DRAWBACKS

AGRONOMICS

1. Main crop yield can be **reduced in the short-term**
2. **Dependency on local environmental conditions** for a successful green manure development and establishment
3. **Potential problems of competition for water and nutrient** between the main crop and the green manure given the harsh environmental conditions (e.g., low rainfall, soil organic matter and nutrients)

ENVIRONMENTAL

1. **Local environmental conditions will determine the success or failure of the green manure implementation** and establishment
2. In extremely dry years the atmospheric N₂ fixation by legumes is strongly hampered by drought stress and competition for soil N can occur between the greenmanure and the main crop
3. The environmental benefits **depend on the soil management** (mowing date, incorporation or not of sowing, etc.)

FINAL CONCLUSION

The results indicate the potential **viability of implementing reduced tillage frequency and crop diversification in rainfed woody crops**, given the significant environmental and agronomic benefits that have been observed increasing the production of the main crop at the long-term. Thus, the potential drawbacks of implementing these practices are clearly offset by the benefits