

# Organic diversified horticulture in Spain

## Long Term Experimental Plot 1

*Experimenting crop diversification and low input farming*



Experimentation plot of 0.2 ha with lettuces, cabbages, broccoli, leek, celery, melon and pumpkin located in Roldán, Murcia (Spain).

This case study has been under vegetable cultivation since early 1990s, using multiple cropping (winter and summer crops), rotations and drip fertigation

### 3 MANAGERMENTS EXPERIMENTED WITHIN THIS CASE STUDY

#### CONVENTIONAL MANAGEMENT

using a yearly addition of sheep manure as an organic amendment, inorganic fertilisers for fertigation and pesticides

#### ORGANIC MANAGEMENT

using a yearly addition of sheep manure, amino acids as fertigation to provide nitrogen, and no pesticides

#### ORGANIC MANAGEMENT

using a yearly addition of compost, amino acids to provide nitrogen, compost tea to provide organic compounds and nutrients in fertigation, no pesticides and cover crops of oat and vetch between cropping cycles when possible. Soil was protected against evaporation and development of weeds by use of plastic mulch

#### WHY IMPLEMENT THESE MANAGEMENT PRACTICES?

Intensive horticulture is leading to **soil and water pollution, soil degradation, decrease in biodiversity, increased incidence of pests and diseases** and is thus compromising long-term sustainability.

**Crop diversification and low-input management is needed to reverse this trend.**



DIVERFARMING



## MAIN BENEFITS

## MAIN DRAWBACKS

### ENVIRONMENTAL

1. Organic management with addition of compost resulted in the **highest values of soil organic matter, total nitrogen and bioavailable nutrients**

2. Microorganisms in soils under organic management were associated to organic matter decomposition, **increasing soil fertility**, and competitors with soil-borne pathogens that may decrease the incidence of diseases in the long-term

3. Organic management **prevented the observed accumulation of pesticide residues and nitrates in the soil** under conventional management, thus preventing soil and water pollution

1. The continuous use of plastic mulch to protect soil against evaporation and weeds development has contributed to **soil pollution by plastic debris**



### AGRONOMICS



1. **Crop yield under organic management was slightly lower** than the conventional system for all crops, although **differences tended to decrease with time**.

This indicates that high yields may be achieved under organic management once it has settled down in the field for at least 10-15 years

### FINAL CONCLUSION

Is it beneficial to adopt these sustainable practices?

The use of compost as fertiliser following multiple cropping and rotations and the use of cover crops within crop cycles contributes to **increase soil organic matter and nutrients**, with changes in the microbial community structure related to soil organic matter degradation. This increases the availability of nutrients, and decreases soil-borne disease incidence.



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