

# Tillage in rainfed arable systems

## Long Term Experimental Plot 4

*Experimenting crop diversification and low input farming*



Experimentation plot of 0.5 ha with rainfed barley located in Huesca (Spain).

## 2 MANAGERMENTS COMPARED WITHIN THIS CASE STUDY

**NON TILLAGE**

**CONVENTIONAL TILLAGE**

### WHY IMPLEMENT THESE MANAGEMENT PRACTICES?

In order to favor more sustainable cropping systems and more resilience facing present/future threats such as global warming



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## MAIN BENEFITS

### AGRONOMICS

1. No-tillage conserved more water in the soil, resulting in **higher crop yields**
2. **Water use efficiency** (crop yield/water used) increased in no-tillage systems
3. **Higher nitrogen uptake** under no-tillage resulted in lower nitrogen levels in the soil profile

### ENVIRONMENTAL

1. No-tillage **avored soil organic carbon** storage in the upper soil layers
2. The shift from a conventional tillage to a no-tillage system **increased soil physical condition**
3. The layer of crop residues in soil surface under no-tillage **reduces soil erosion rates**

## MAIN DRAWBACKS

### AGRONOMICS

1. More attention is needed in **weed control** under no-tillage
2. Crop sowing and establishment need **more caution**
3. No-tillage implementation needs **special machinery** (seeder)

### ENVIRONMENTAL

1. No-tillage may **increase soil compaction** under certain conditions especially the first years after adoption

## FINAL CONCLUSION

Is it beneficial to adopt these sustainable practices?

No-tillage is a promising practice in rainfed semiarid systems because of its beneficial effects such as soil and water conservation and crop yield enhancement



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