



Sustainable farm Management Aimed at Reducing Threats to SOILs under climate change

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Stakeholders told us that they wanted real life stories of farmers as a way of disseminating information about soil organic carbon management (SOC). In response to this we are preparing Real Life Case Studies (RLCS) for each of the six case study regions (in Spain, Hungary, Denmark, Scotland, Italy, Poland). As part of this farms implementing one or more of practices known to enhance SOC were identified. The farmers were interviewed, and data (soil, crop and financial) was collected to run the SmartSOIL model and to assess the impact of the practice and its cost effectiveness. This information will be used to create local language RLCS leaflets which will feature together with the Decision Support Tool, videos and fact sheets in the SmartSOIL toolbox.

In Spain SmartSOIL partner Bertha Sanchez spoke to Rafael Alonso Aguilera (pictured below) who runs a 650 ha Organic mixed farm producing high quality olive oil in Andalucía. Rafael is using minimum tillage, cover crops and crop inputs in his rotations. The following is a summary of some of his responses to questions about incorporating these practices.



*“The soil is mainly sandy-loam and due to the hostile climate where the mean precipitation is around 200 mm, we struggle with soil erosion and water retention. Sustainable farm and soil management have always been in our philosophy. We are always thinking about how to provide more nutrients to our soils in sync with the nature, since they are pretty poor.”*

### **How have you incorporated minimum tillage, cover crops and crop inputs into your rotations?**

Reduced tillage is applied all over the farm, as this helps with the soil erosion problems prolific in this region. Cover crops are implemented more spontaneously for seasonal protection. In terms of inputs, we leave the pruning debris from olives on the soil to provide more nutrients, as well as grass cuttings when they are available. The waste from the olive oil mill is mixed with livestock waste (mainly from sheep) and returned to the field as organic manure fertilization to increase the organic content in our soils. We started using the practices, like minimum tillage by testing on smaller, flatter fields. I developed a plan so that I could make these changes without external financial support or subsidy.

### **How has the soil benefited from this change?**

We record and analyse our soils, and we have seen an increase in soil organic matter and in turn soil fertility. We know this is from the pruning debris, grass and application of composts. Thanks to these practices, the soil water retention is much better, erosion has reduced and the microorganism population is larger. During the years with more precipitation we have observed a large worm population in our soils.

### **How have the yields been affected by this change?**

We have similar yields to other farms in the area which use conventional management. We have a mean olive yield of about 8t/ha, which is four times higher than the average production volume in Spain. The conventional farms are using about 40% more water and applying inorganic fertilizer, so we have lower costs associated with the same yields. We use less water and save on fertilizer purchasing.