

This series of informative fiches aim to present, in summary, examples of practices and approaches that EU Member States and Regions have put in place in order to implement their Rural Development Programmes in the current period. These examples want to contribute to the understanding of what has worked well and less well in the delivery of the 2007-2013 RDPs and as far as possible, draw lessons in the view of future improvement of the programmes.

Composting Plant adds value to waste products in Spain



BACKGROUND AND SCOPE OF THE PROJECT

In the province of Jaén (the first world producer of olive oil) there is a small town called Los Noguerones, known for its white soil that produces high quality olive oil. Motivated by the desire to produce top quality olive oil, a small group of olive growers decided to form the Cooperative Nuestra Señora de los Remedios in 1966. Their vision was to apply the same interest and affection with which they took care of their olives to the whole olive oil production process in order to obtain a high quality product.

The cooperative has 837 members and is dedicated to continuous improvement of the olive oil production process.

Since its creation, it has been expanding and improving its facilities with extreme quality control in order to offer customers a product that has been treated with care from the

olive tree to the consumer's table.

The cooperative uses an integrated production mill in the olive oil extraction process. The process results in a by-product, known as olive cake, which can pollute the soil and water systems if not managed correctly. The starting point of the project idea was how to deal with this by-product. The president of the cooperative suggested to the members to invest in recycling the by-product using composting techniques and the idea was approved unanimously.

The main project objective was twofold: to recycle waste products and to support organic olive farming. More specifically, the organic by-products from the olive oil factory are recycled through the composting technique. These recycled by-products are given back to olive grove farms for use as nutrients, thus making the production system more sustainable in the long run by reducing dependency on chemical fertilisers.

The expected benefits were:

- ⇒ Improved soil quality by using organic compost and reduced dependency on chemical fertilisers;
- ⇒ Introduction of environmentally friendly fertilisation techniques to olive grove farmers which at the same time motivate them towards organic farming;
- ⇒ Environmental benefits from recycling the olive cake and not disposing of it;
- ⇒ Further environmental benefits from reduced pollution from nitrates in aquifers.

Keywords: Competitiveness of Agriculture & Forestry; Restructuring, developing physical potential, and promoting innovation

EU Member State: Spain

Specific Location: Los Noguerones, Alcaudete, Provincia de Jaén, Andalucía

Main beneficiary/ies: Cooperative Nuestra Señora de los Remedios

RDP Measure(s): Measure 123: Adding Value to Agricultural and Forestry Products

Funds Allocated: Total cost: €223 379

EAFRD: €65 472

Private contribution: €129 847

National contribution: €28 059

Implementation Period: 10/08/2010 – 30/06/2011

Current practices across the EU27



DEVELOPMENT AND PLANNING

A feasibility study was carried out with the support of a consultant from the regional government of Andalucía. It confirmed the viability of the project and the direct benefits to farmers. No risks were identified, especially no environmental risks.

A detailed project plan was also developed including the detailed works and a timetable for these works. The implementation plan has been indispensable for the project and reflects the cooperative's principle that every activity undertaken must be described in detail and justified.

The main bottleneck encountered was the long delay in obtaining the approval from the environmental authority of the region (Autoridad Ambiental Unificada). It took almost two years to obtain the approval. The main reason appears to have been the strong pressure from the companies that produce olive pomace oil (low quality oil produced from olive cake, the by-product from the olive oil extraction process). The recycling of the olive cake to produce compost would compete with the olive pomace oil producing companies of the region, hence their objection to this project.

This difficulty was overcome thanks to the persistence of the cooperative and its president to go ahead with the project and the support they received from the regional government of Andalucía.



IMPLEMENTATION OF THE PROJECT

Project implementation involved the construction of a composting plant to process the olive cake together with the leaves cleaned from the olives, olive tree pruning residues and some liquid effluent from the mill. The main activities comprised:

- ⇒ Construction of a composting yard with a waterproof base made of concrete and gravel in order to minimise the risk of polluting the soil and aquifers;
- ⇒ Construction of a cistern for the drainage of excess liquid;
- ⇒ Construction of a canal and irrigation system for the compost.

The composting process works as follows: the olive cake is deposited in large piles in the composting yard. It is left there to drain any excess liquids. Next, it is mixed with leaves cleaned from the olives, olive tree pruning residues and some liquid effluent from the olive mill. The mixture is then turned over several times at regular intervals with the use of an excavator to maintain the right temperature and facilitate fermentation, which is part of the composting process.

A progress report was produced for each implemented phase of the project. The total project duration was 2 years, of which 6 months were dedicated to the construction works. Quality control is embedded in the functioning of the plant through yearly controls from the environmental department of the regional government. This distinguishes it from other private plants that, in addition to their smaller size and capacity, they are of much lower quality standards.

Modifications to the initial project planning took place without jeopardising the final quality of the output. It was initially foreseen to construct a 5,000 m² composting yard. However, the delay in obtaining approval from the environmental authority mentioned above demotivated the cooperative members who started having second thoughts about the viability of the project. It was therefore decided to build a 3,500 m² composting yard. Eventually, the outcomes of the project and the success that the composting plant is experiencing have resulted in increased confidence of the cooperative members. There is mounting interest for this composting process not only from this region but also from other regions and countries.

Current practices across the EU27

The difficulties encountered during the implementation are related to the lack of experience and to external factors. More specifically, a lack of experience with this type of composting process: the first year an excessively large quantity of olive cake was piled up together with leaves and olive tree pruning residues which reduced the effectiveness of the composting process and part of the mixture got rotten. As a result the cooperative could not serve its clients with the compost quantities foreseen. The second year, after learning from this experience, the cooperative created smaller piles and turned them over frequently to reduce them in size and facilitate the fermentation process. As a consequence, the foreseen quantities were produced and eventually all products sold.

On the other hand, external factors, in particular climate conditions, may always impact on the composting process since it takes place in the open air. For instance, two years ago, scarce rainfalls resulted in limited water availability for irrigation, while in June 2013 excessive rainfalls did not allow turning over the mixture of olive cake, olive tree leaves and pruning residues.



RESULTS OF THE PROJECT IMPLEMENTATION

The project has been successful in adding value to a residual product from the production of olive oil. There are few composting plants of this kind in the region. Before the project, olive cake was used either for the production of a low quality oil (orujo in Spanish) or it was burned to produce energy. The former resulted in a low value, low quality product while the latter resulted in greenhouse gas (GHG) emissions. Currently, the olive cake is transformed into organic compost which is available to the members of the cooperative at a very low cost: they only pay the cost for transporting it to their farms and a small fee for the amortisation of the composting plant. Other farmers, not members of the cooperative, can also buy the compost at a slightly higher price.

The olive cake is produced during a period of the year with frequent rainfalls. This makes it difficult to dispose of it in the fields and it is not a product that can be stored either. The solution of using it for making compost is a viable and environmentally friendly one. The compost produced has a positive impact on the environment for the following reasons: a) it implies a reduction in the use of chemical fertilisers; b) it reduces GHG emissions and the carbon footprint in the soil; c) it contributes to increase the organic material in the soil and reduces soil erosion problems which are frequent in this part of Andalucía.



The project has also encouraged farmers to consider organic farming methods. Around 50% of the approximately 800 members of the cooperative use the compost produced in the composting plant of Noguerones. What started as an innovative process, with a lot of scepticism around it, is becoming an effective method for soil treatment and a step towards conversion to organic farming. Several certified organic olive oil producers in the region use this product for fertilisation, while they control plagues and pests with other non-chemical products. One of the main achievements of the project has been increased awareness of the benefits of organic production and an increased tendency of farmers to convert to organic production methods.

There has also been employment creation as a result of the project. One worker has been hired (working full-time during peak periods and part-time otherwise) and is in charge of mixing the products, turning over the mixture when needed and maintaining the piles of compost in appropriate conditions. In addition, two members of the cooperative have bought trailer trucks which are used for transporting the compost from the composting plant to the farms. Some farmers use their own trucks to pick up the compost but others use the new service offered by the two newly bought trailers.



LESSONS LEARNT

Factors that contributed to the success of the project:

- ⇒ **Vision.** The overarching success factor was the vision and persistence of the president of the cooperative to add value to a product which offered no benefits otherwise, the by-product of olive oil production.
 - ⇒ **Support from the cooperative members.** The project received support from the members of the cooperative. It is not very common for members of agricultural cooperatives in Andalucía to easily agree on innovative approaches to their farming processes. This can be considered innovative as it is not common to use olive cake for the production of compost. Similar approaches are usually undertaken by private farmers in Spain but not by cooperatives.
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- ⇒ **Institutional support.** It also received support from the technical experts of the regional government of Andalucía (including the Andalusian Institute of Agricultural Research and Training and Organic Production – known as IFAPA in Spanish) who saw in this composting plant an opportunity to recycle by-products and re-use them for other purposes (compost) while bringing environmental benefits (increased organic matter in the soil, reduced soil erosion).
 - ⇒ **Dissemination.** Information about the project has been disseminated to the members of the cooperative since its inception and has succeeded in obtaining wide support and most importantly, the compost produced is actually used by the cooperative members. During the inception phase of the project, the president of the cooperative took advantage of the Open Days organised by the cooperative to invite technical experts from the regional government of Andalucía, from Jaén University as well as representatives of organic farms to discuss and demonstrate the benefits of using olive cake to produce organic compost. During the project planning and the implementation phases the project and its benefits were presented to the annual general assembly of the cooperative.

Factors that impeded the success of the project:

- ⇒ The project is considered a success and has delivered the expected results. The initial delay in obtaining approval from the environmental authority highlights the challenge of dealing with strong farmers' lobbies in rural areas. Another difficulty has been the lack of practical experience with such composting processes. Research studies undertaken by the research institute IFAPA provided technical background but the reality proved to be different. It therefore took some time to learn the right quantity of olive cake and the type of mixture that can effectively transform into compost.

Resolution of problems/difficulties:

- ⇒ The only way to overcome the above administrative delays has been persistence and eventually the approval of the environmental authority was granted. The lack of experience was also overcome with persistence and careful observation of all the steps in the process and learning in practice.



WHAT'S NEXT?

The project has been viable after its completion date and it is gaining visibility and reputation over time. After the initial investment, the cost of maintenance and running the process is relatively low. The compost produced is sold every year and there are no stocks. This is an indication of the increasing demand for this product and a guarantee for its financial sustainability.

Another factor that guarantees sustainability is the clear environmental benefits it entails vis-à-vis other methods. The composting plant uses a system of dynamic piles (i.e. the mixture of olive cake, leaves and pruning residues that is turned around regularly) which is environmentally friendly as opposed to the more traditional fermentation in a pool system which is far more polluting.

In addition, the project has generated the interest of farmers from other Spanish regions, such as Castilla la Mancha, Cataluña and Extremadura, and also international interest. In Castilla la Mancha there are several olive oil mills that have set up composting plants using the olive cake. In Cataluña, there is a serious problem with disposing of olive cake as most of the orujo producing companies have closed down and farmers do not know how to dispose of it. As a consequence, five olive oil mills in Cataluña have developed draft proposals for the installation of composting plants and are searching for financial sources. In Extremadura, there is discussion about this type of composting plant that adds value to the olive cake, but financing sources are also sought. The project has also appeared in the magazine of the Spanish Society for Organic Agriculture.

At international level, there has been interest from Turkey, Morocco, Argentina and Chile. Turkey faces several environmental challenges in agriculture such as pollution risks of drainage basins. A consultant working on the development of a Turkish project to address these risks contacted the expert of the regional government of Andalucía who was involved in the composting plant project to learn from the Andalucía experience. Morocco was developing an advisory service on composting processes but the initiative is still pending due to lack of funding. Despite the lack of a concrete transfer of the experience at international level, this interest demonstrates the potential of the project to be replicated in other regions of the world.





SUMMARY

This is a Spanish cooperative project that built a composting plant to recycle olive oil production by-products for use as nutrients in olive groves. The project enhances soil quality and reduces the potential polluting capacity of such by-products. This is a representative example of a successful project implemented by a cooperative in a context where cooperative members do not easily reach agreement to invest on value adding processes which usually have an innovative character and therefore include uncertainty.

Tips/lessons related to the beneficiary:

At the project inception phase:

- ◆ Good leadership within the cooperative is essential for taking ambitious steps to introduce methods that are not common or very well known.
- ◆ Institutional support is a key prerequisite as it can accelerate or delay the project implementation process.
- ◆ A good understanding of the benefits of the project facilitates its approval by the relevant authorities.

At the project planning and development phase:

- ◆ A thorough business plan, including detailed activities, cost, realistic timetable and resources allocated to each task.
- ◆ A dedicated project manager (in this case the president of the cooperative) who continuously motivates and encourages stakeholders (in this case the members of the cooperative) to maintain and increase their interest in the project. A committed project manager can also manage difficulties imposed by other farmers' interests (in this case the orujo producing companies).

At the project implementation stage:

- ◆ Good technical knowledge benefits implementation but it needs to be complemented with practical experience. When practical experience is missing, project promoters could obtain early advice and support from experts/farmers with similar experience.
- ◆ Continuous information provision to the members of the cooperative contributes to increase their trust in the project and consequently they became the main users of the compost produced.

Tips/lessons related to Managing Authorities and other public sector actors:

- ◆ The composting of agricultural by-products and their subsequent application in the soil of organic farms constitutes an increasing tendency in Andalucía. The regional authorities can support this trend by employing the relevant expertise to follow-up and advice beneficiaries/farmers who engage in these processes.
- ◆ Regional authorities can engage relevant experts to advise beneficiaries on technical issues and therefore facilitate their learning from experience.