# Bioferti+: Production of a tailor-made pelletised bio-fertiliser for woody crops as a waste recovery strategy for composted manure and other organic by-products

## Summary

The main objective of the project is to convert a composting plant into one that produces high-quality pelletised tailor-made fertilisers (TMF) from cattle manure to be used in the fertilisation of woody crops, such as vines and apples.

TMFs are organic fertilisers with a high nutrient content that are adapted to the specific needs of each crop, derived from an ad hoc formulation based on different raw materials. This is undoubtedly one of the strategies with the greatest potential for livestock waste recovery and, at the same time, improving the quality of agricultural soils, thus turning a threat into an opportunity and boosting the bioeconomy in the Catalan agri-food sector.

To achieve this objective, the project will use the cow manure compost produced in a composting plant in Osona. Once matured, sieved and dried, it is then formulated into the tailor-made fertiliser. The TMF will be formulated based on the needs of each crop, which will not only be determined by the crop itself, but will also take into account other aspects such as the type of production (organic, integrated and conventional), the characterisation of the soil and the climatic conditions of the region, among other things. This means that, using cattle manure compost as a basis, other materials will be incorporated in order to balance the nutritional input of the fertiliser to the nutritional needs of the target crop. Subsequently, the TMF will be transported to a pelletising plant where the TMF pellets will be manufactured.

The pelleting process offers an economically competitive benefit in terms of transport, and also represents an advantage from a practical point of view for farmers, since it allows them to use the machinery that they already use for chemical fertilisation. This also ensures that the fertilisation process is much more precise. Finally, because pellets decompose gradually, the soil and the crop are fertilised over a long period of time.

## Objectives

- Waste recovery of cattle manure and other organic waste.
- Increase the biological and physical-chemical quality of agricultural soils.
- Promote an agriculture and livestock sector that contributes to climate change mitigation.
- Promote an agriculture and livestock sector that is more resilient to climate change.
- Create new business models based on the circular bioeconomy.
- Generate new jobs in rural environments based on the circular bioeconomy.
- Raise awareness in the livestock sector to improve the management of livestock manure and in the agricultural sector to use organic fertilisers instead of mineral fertilisers.

## Description of the actions planned in the project

**Activity 1. Optimisation of the composting process to obtain products with fertilising capabilities**

- Optimisation of the composting process implemented on-farm with composting facilities to generate a high quality compost that adds value to the TMFs designed in this project.

**Activity 2. Formulation and production of tailor-made bio-fertilisers (TMF) for vines and apple trees**

- Processing, sieving and drying of compost and other raw materials as required.
- Formulation for obtaining TMF from different raw materials depending on the target crop (minerals, organics from the agri-food industry, organics from other crops, etc.), with a prior study of the nutritional needs of the target crops.
- Pelletisation of the TMF to obtain a compacted product, but at the same time one that is sufficiently degradable to provide nutrients and organic matter over a long period of time.

**Activity 3. Fertilisation trials on test vineyards and apple orchards**

- In-situ fertilisation trials to demonstrate the nutrient use efficiency of TMF produced in vineyard and apple tree production.

**Activity 4. Technical, economic and environmental feasibility study of the developed system**

- Determine the viability of the business model that allows for the waste recovery of manure and other organic waste, while increasing the quality of the soil and target crops. For this reason, beyond the environmental benefits, it is necessary for the project be technically and, above all, economically viable.

**Activity 5. Transfer and dissemination of results**

- This project aims to be a driver that promotes the bioeconomy in the Catalan agriculture and livestock sector and raises awareness among livestock farmers to improve the management of livestock waste, through waste recovery models and among farmers to increase practices that help mitigate climate change and increase resilience to it. The results obtained therefore need to be disseminated at conferences related to these two sectors (agriculture and livestock), as well as for other key actors, such as the public administration and companies that manufacture and market fertilisers.

## Expected results and practical recommendations

The following results are expected:

- Improve the composting process of cow manure and increase its commercial value.
- Determine the ideal characteristics of all processes for the formulation of TMFs: sieving, drying, formulating and pelletising.
- Assess the economic, technical and environmental viability of the business model.

- Manufacture TMFs that meet the needs of different target crops and are competitive on the market, both in organic, integrated and conventional production.
- Demonstrate that TMFs meet the needs of the target crop while improving soil characteristics, thereby promoting an agricultural sector that contributes to climate change mitigation and is more resilient to it.
- Promote improved livestock manure management and quality organic fertilisation.

## Leader of the Operational Group

**ORGANISATION:** AGRÀRIA PLANA DE VIC I SECCIÓ DE CRÈDIT, SCCL

## Coordinator of the Operational Group

**ORGANISATION:** CATALAN FEDERATION OF AGRICULTURAL COOPERATIVES (FCAC)

## Other members of the Operational Group (grant recipients)

**ORGANISATION:** GRANS DEL LLUÇANÈS, SL

**ORGANISATION:** COVIDES, SCCL

## Other members of the Operational Group (not recipients of the grant)

**ORGANISATION:** BALMES UNIVERSITY FOUNDATION (BETA TECHNOLOGICAL CENTRE)

**ORGANISATION:** GIRONA FRUITS, SCCL

## Subject area(s) of application

| | |
|---|---|
| ☐ | Agricultural production system |
| ☐ | Agricultural practice |
| ☐ | Agricultural equipment and machinery |
| ☐ | Livestock farming and animal welfare |
| ☐ | Vegetable production and horticulture |
| ☐ | Landscape / Territorial management |
| ☐ | Pest and disease control |
| ☒ | Fertilisation and nutrient management |
| ☐ | Soil management |
| ☐ | Genetic resources |
| ☐ | Forestry |
| ☐ | Water management |
| ☐ | Climate and Climate Change |
| ☐ | Energy management |
| ☒ | Waste and by-product management |
| ☐ | Biodiversity and environmental management |
| ☐ | Food quality/processing and nutrition |
| ☐ | Supply chain, marketing and consumption |
| ☐ | Competitiveness and agricultural and forestry diversification |
| ☐ | General |

## Geographical area(s) of application

| PROVINCE(S) | REGION(S) |
|---|---|
| - | Osona, Alt Penedès, Gironès |

## Dissemination of the project (publications, conferences, multimedia, etc.)

Summaries and content on partner websites. Social media and dissemination at sectoral events.

## Project website

## More information on the project

| PROJECT DATES | TOTAL BUDGET |
|---|---|
| **Starting date:** July 2021 | **Total budget:** €194,207.18 |
| | **DACC funding:** €89,811.66 |
| **Current status:** Under way | **EU funding:** €67,752.66 |
| | **Own funding:** €36,642.86 |

## With funding from:

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*Order ARP/113/2021 of 20 May, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ACC/1660/2021, of 27 May, announcing the call for the grant.*

Generalitat de Catalunya
**Departament d'Acció Climàtica, Alimentació i Agenda Rural**

**Fons Europeu Agrícola de Desenvolupament Rural:**
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