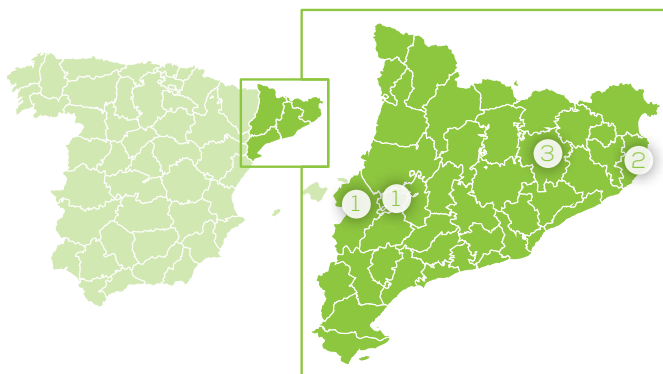


Challenge

Participating partners



1. Vila-sana (Segrià) / Suchs (Pla d'Urgell)
2. Baix Empordà
3. Osona

DESCRIPTION

- Typical Mediterranean biogeographic region
- Mild winters and warm summers
- Many hours of sunshine, free of clouds
- Water scarcity due to low rainfall

CHARACTERISTICS

- High farming intensity of the overall agricultural land
- Highly oriented towards livestock production (65-80% of the total farming activity)
- Livestock is concentrated in specific areas, resulting in high nitrate levels in groundwater, surplus of nutrients in the soil and risk of emissions to the atmosphere

CHALLENGES

- High competition for water among various users
- Soil conservation with low organic carbon content

SELECTED PRACTICES

- Pig manure valorisation, bioenergy and organic fertiliser production
- Mixed farming system with ruminants (precision feeding tools) and production of fodder crops
- Long-term organic fertilisation trials (assessment of changes in soil organic carbon and phosphorus accumulation in soils)

Case study leader :



Collaborators :



Circular solutions for carbon and nutrient management

Case study Catalonia, Spain

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Case study Catalonia, Spain



What ?

Organic fertiliser production and reduction of GHG - NH₃ emissions

How ?

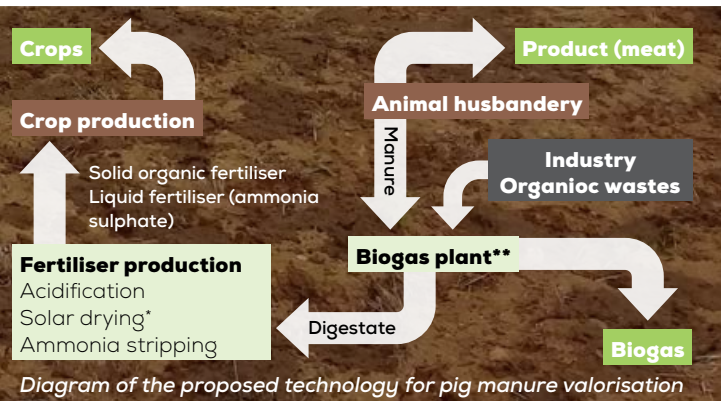
Solar drying technology and Precision Feeding (dairy farm)

Fertiliser production (Vila-sana)

Pig manure valorisation through fertiliser production

Enhancement of a full-scale pig manure treatment facility (anaerobic co-digestion of pig manure, efficient solid-liquid separation) through innovative processes :

- ✓ Solar drying for concentrated fraction of digestates
- ✓ Stripping (N-recovery) for centrates (clarified fraction of digestates)



Parameter % wet weight	Raw digestate	Dried digestate
Dry matter	7.82	88.90
Total N	0.51	6.99
Total P	2.50	2.27

Raw digestate

Dried digestate

Agronomic assessment (Suchs and Osona)

Organic fertilisers and products from Vila-sana are assessed in field crop rotations, as well as through phytotoxicity and growth tests.

Field scale

Rotation 1

Wheat
Barley
Triticale

Rotation 2

Canola
Pea
Wheat



Fertilisation with **raw digestate**



Control mineral fertilisation



Fertilisation with **dried digestate**

Phytotoxicity essay

Germination index and root development measurement.



Phytotoxicity test

Growth test

Combination of fertilisers and peat as a substrate for lettuce plants growth.

Growth test (pots)



Comparison of fertilisation strategies

(application methods, timing and dosage) of fodder crops production with dairy farm manures.



Fertilisation with mineral fertiliser

Storage on farm

Organic fertilisers from Monells are assessed in fodder crop (ryegrass) production and soil nutrients management.

Phosphorous management through crop rotations and intercropping systems are assessed as a strategy for improving soil nutrients management.

Long-term fertilisation trials (Baix Empordà)

Long-term organic fertilisation trials

Long-term available fertilisation trials on arable crops, using different organic products (manure, slurry, slurry fractions).

- ✓ Evaluation of C sequestration in the soil over several years linked to the different organic products used;
- ✓ Evaluation of nutrients, namely P, accumulation in the soil profile and the effects on soil quality characteristics.



General views of fertilisation fields

Precision feeding - Dairy farm (Monells)

Ruminant production and fodder crops production

- ✓ Evaluation of the impact of different bedding materials on GHG - NH₃ emissions.
- ✓ Assessment of the impact of precision feeding versus conventional feeding, comparing :
 - Dairy production indexes;
 - GHG - NH₃ emissions inside the farm & during fertilisation;
 - Manure characteristics.

Distribution of Feed N intake (100%):



Body N losses 5%;
Milk N output 15-40%;
Urine N output 15-45%;
Faecal N output 25-40%.



Dairy cow eating in the precision feeding system

Conventional Feeding (CF)	Precision Feeding (PF)
2 pens with 15 cows each	2 pens with 15 cows each
Conventional TMR for 30 kg milk cow	Precision TMR for 25 kg milk cow
No extra feeds	Extra feeds during milking

TMR - mix of concentrate feeds



Storage of cow manure at the dairy farm