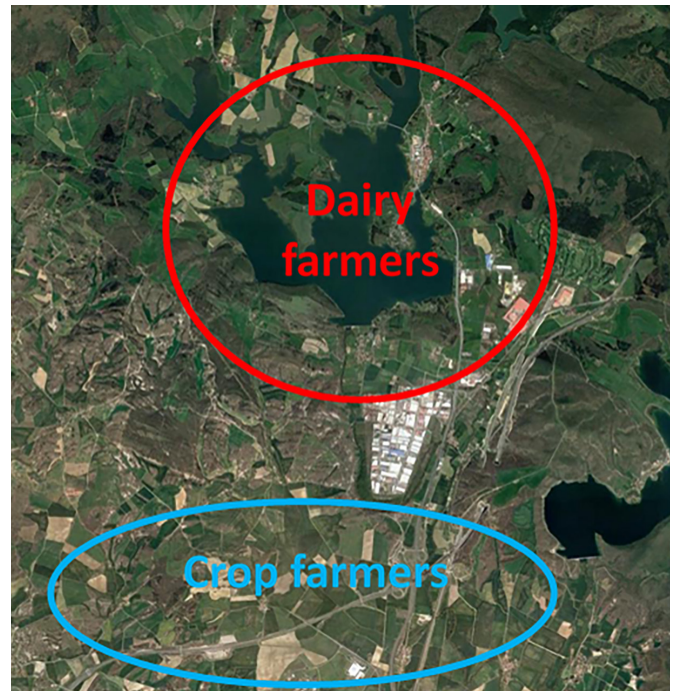

MANAGING ORGANIC NUTRIENTS

A novel and collaborative approach

Livestock production leads to valuable outputs of organic resources (manure, slurry, waste water, etc) that could be used to supply nutrients and avoid soil organic matter depletion in agricultural soils. Nevertheless, it is not always possible to link the excess of organic matter in animal waste to the demand of soil nutrients that exists in agricultural soils. This is also the case in the Basque Country (north of Spain). This province has a Mediterranean climate, although with influence of the Atlantic area where the region is located.

This means that rainfall events can contribute to fill uncovered slurry pits in rainy seasons, which increases costs, environmental risk and complicates management. In Alava, a town in the Basque Country, ABERE (farming advisory centre), together with a group of 7 farmers (representing more than 25% of dairy production in the province) have devised an innovative way to manage their slurry, reducing the environmental footprint of primary production, and the supply chain as a whole.



Collective storage to optimize slurry management

The innovation consists of a collective slurry storage system together with a fertilization plan specifically calculated for individual fields, meeting regulatory and environmental protection needs, to optimize slurry management. Slurry transport and application machinery are organized as part of slurry management. This slurry storage system consists of a covered flexible bag, as a complement for the usual slurry pit system. Technical and economical parameters for the innovation can be found in Table 1. The composition material is similar to the one commonly used for farm lagoon liners, where geomembranes have been welded. A chimney system prevents overpressure inside the system. It has two openings for loading and

stirring operations. The agricultural fields that receive the slurry are located within a radius of 2 km, and are fertilized following recommendations to cover the nutritional needs of different crops (wheat, oat, barley, etc.). The system stores around 4 millions litres of slurry that are applied on cropland annually.

The innovation has several distinct aspects: the way the farmers are organized in a cooperative, the storage system itself, the use of application equipment (trail hoses) and the linkage to nutrient application rates specific to each field as recommended by the regional advisory centre.



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Table 1: Technical and economical results

Storage capacity	5 million litres slurry
Cost (including construction costs)	530 €/m ³
Number of dairy farms	7
Total number of livestock units	1,920
Average milk production (L/cow/year)	9,900
Livestock used area	525 ha + 250 ha arable land
Amount of slurry managed	4 million litres



TESTIMONY

ABERE is the farming extension service that operates in the region connecting livestock and agriculture farmers. They organize the collective storage and distribution of slurry to cropland. They acknowledge that the system is an important facility for the farmers, as increasing slurry pit size is not always possible for various reasons. Furthermore, farmers can rely on the advisory centre to ensure correct slurry use, since the applied amount is calculated to cover agronomic needs, and at the same time, to be in full compliance with regulations. It also reduces largely the need for other treatments, which is very attractive both from the technical and economical point of view.

Based on farmer feedback, there is a tangible improvement in soil quality, with regard to nutrient availability, soil texture and water retention. Additionally, the use of slurry provides economic advantages and reduced carbon footprint by decreasing the use of mineral fertilizers. Farmers have not observed any decrease in the crop yield, thus they will continue using slurry to fertilise their crops. In fact, they are increasing the range of crops that receives this fertilization, which in the end, is leading to a situation where the slurry demand is higher than the actual offer.



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