

Agro-industrial waste put to good use as biofertiliser

A fertiliser producer in Italy is using municipal waste in anaerobic digestion and recovering the digestate as a nutrient-rich biofertiliser. A specific process has also been developed using GPS to reduce loss of nutrients during application on the fields.



Recovering nutrients from waste

Soils are prone to the loss of organic matter. Farmer Alberto Penati (Italy) says "I've noticed a loss of fertility in soils since I've start using only mineral fertilisers, so I need an organic one to restore organic matter in soils."

Acqua & Sole, in Lombardia, North Italy, treats more than 120,000 tons of sewage sludge and agro-industrial waste per year. They realised that there was an opportunity to reuse waste coming from organic sources in the form of fertiliser.

Through anaerobic digestion, Acqua & Sole now transforms this waste into organic fertilisers and organic soil improvers with a range of nutrient contents, providing solutions for the local farmers. Acqua & Sole's organic soil improvers are applied in the region and they have many beneficial effects on soil quality and contribute to the sequestration of carbon in soils.

Optimising application of the biobased fertiliser

Acqua & Sole not only produces the biofertiliser, but it also implements a system for its application. Using GPS and volumetric pumps, the fertiliser is uniformly applied to the land. The precision of this method reduces any possible loss of nutrients.

In addition, the company is field-testing Near Infra-Red (NIR) technology for real-time measurement of the nutrient content while spreading on land. This will lead to a more balanced application of the fertiliser and its nutrients. It will also make it easier to monitor the process, meaning that corrections can be made in real-time so as to avoid surpluses and environmental problems.

Problems to overcome

Disposal of sewage sludge on land has a negative image and is considered as a disposal action rather than something useful. Furthermore, the high nitrogen (N) content of organic soil improvers limits the amount of organic matter that can be used. This is because of restrictions on the quantity of N that can be applied so as to avoid N fertilisers leaching into the groundwater and causing water pollution.

In order to overcome these problems, Acqua & Sole, together with the Milano University became partners in the [Horizon 2020-project SYSTEMIC](#) (2017-2021). One of the main aims of the project is to demonstrate the effective combination of anaerobic digestion with nutrient recovery and recycling technologies. The partners will implement and demonstrate a new nitrogen recovery absorber to recover N in a mineral form and to reduce the N content of the organic fraction of the fertiliser.

The project will also improve the image of biowaste by showing that its products are free of undesired contaminants and pathogens as the biowaste goes through a hygenisation process. It will also demonstrate the agronomic performance of the products in large-scale field trials.

Benefits for farmers

Farmer Giovanni Bargigia says "It is a big opportunity for the whole area to enrich soil fertility and to reduce fertilisation costs." Better soil fertility with an increase of the soil organic matter is combined with reduced spending on mineral fertilisers. The big benefits for the farmers in Lombardia is that organic soil improver with a reduced N content can be used as a resource of organic carbon without exceeding maximum fertilisation limits for N-application.

Contact

More information can be found on <https://systemicproject.eu/>

Photo: Acqua & Sole

EIP-AGRI Focus Group on Nutrient Recycling

Check out the results from the EIP-AGRI Focus Group on Nutrient Recycling [here](#).