

TRAINING MATERIAL

Title:

Technology for N&P recovery as microalgae based biofertilisers starting from wastewater with heterotrophic microalgae

Training:

What is the product?

A system that combines the treatment of effluents from processing fruit and vegetables sector with heterotrophic microalgae and the recovery, as a biofertiliser, of the N and P contained in the microalgae (Figure 1).

Who is the vendor of the product?

Fundación CARTIF.

CARTIF is a horizontal, private and non-profit technology center. Its mission is to offer innovative solutions to companies to improve their processes, systems and products, improving their competitiveness and creating new business opportunities.

CARTIF develops R&D projects, directly funded by companies or public funds raised through competitive calls for national and international level. CARTIF also advises public authorities (municipalities and regional governments) in the planning and development of innovative projects with high economic returns.

Which other technologies are provided by the vendor?

Technology for P recovery as struvite starting from pig manure digestate with fluidized bed crystallization system.

“Revawaste” process (Technology for P recovery as struvite starting from digestate coming from methanogenic reactor and manure).

“Valuvoil” process (Technology for N&P recovery as digestate starting from vegetable oil waste with pig manure with).

“Mix-Fertilizer” process (Technology for N&P recovery as enriched compost from digestate of pig manure).

Which are the advantages of the technology and the problems addressed?

Closed-loop technology in which no sludge or waste is generated and the recovered by-product is used as a final product due to its nitrogen and phosphorus content (biofertiliser). The process is energy efficient because it is powered by renewable energy (solar energy supported by biomass), which minimise the carbon footprint and operating costs (Figure 2).

How does the technology work?

Consist of three main steps (Figure 2): 1) microalgae growth in closed bioreactor with wastewater, which consumes the organic matter and nutrients; 2) separation of treated water and microalgae concentrate by centrifugation; and 3) drying with spray dryer of microalgae concentrate for recovery in powder format (biofertiliser).

How/where to use the technology?

To carry out the treatment it is necessary to add microalgae in the wastewater and to allow the growing for a certain time. Treated water is obtained as main stream and used for fertigation (low concentration of N) and a microalgae concentrate stream is obtained as by-product which becomes a final product as well (biofertiliser).

Which are the authority permits and in which EU countries?

The only authority permits required for this technology in all EU countries, are the administrative authorisations approved by the Local Authority for obtaining the building permit allowing the installation of the plant in the area where it will be located. As it is a non-polluting technology, it is not environmentally harmful and does not need environmental authorisations.

How much does it cost?

The capital expenditure (CAPEX) of the technology will depend on the treatment capacity. It should be noted that this is a demonstration plant and would be different on an industrial scale, therefore no values can be given right now.

Pilot scale tests are being carried out and there are no operational expenditures (OPEX) results at present.



Figure 1. Demonstration plant for microalgae based fertilizer production

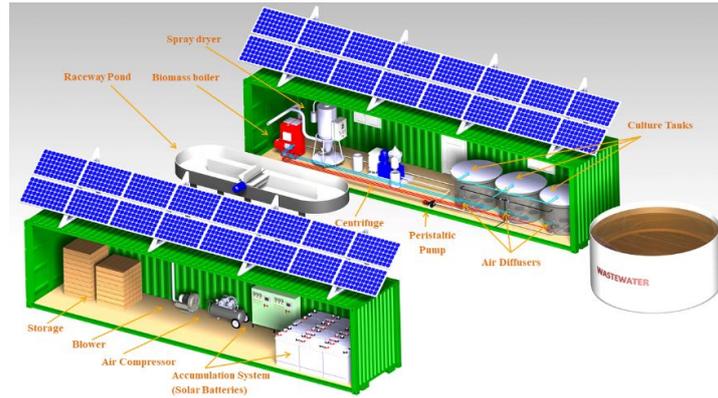


Figure 2.3D image of the real pilot plant

For more information: https://nutrیمان.net/farmer-platform/technology/id_253