

TECHNOLOGY FOR N&P RECOVERY AS DIGESTATE STARTING FROM VEGETABLE OIL WASTE WITH PIG MANURE WITH "VALUVOIL" TWO-PHASE ANAEROBIC DIGESTION PROCESS



Two-phase anaerobic digestion • Agronomic valorization of digestate

Key facts:

- **Category of the technology:** Two-phase anaerobic digestion
- **Input:** Vegetable oil waste with pig manure
- **Output product(s):** Biogas / Digestate
- **Available capacity:** 50 l/h
- **Focusing geographical areas:** EU28
- **Technology status:** TRL7
- **EC/MS Authority permits:** Waste treatment facility permits



Summary of the technology:

VALUVOIL technology demonstrates the viability of the **improved anaerobic digestion process** for biofuel production and the potential uses of the organic by-products for stimulating plant growth and as compost for improving soils. After determining the **agronomic quality of the obtained digestate**, it was demonstrated that it was not ecotoxic and that its macro and micronutrients content (being N the most abundant) conferred it a certain fertilizer character and an optimum agronomic quality. Plant grow assays carried out in growth chambers with different species and soils, also confirmed the results obtained in germination tests, where treated soils showed a higher growth than in control ones, being the highest plant yields obtained at high rates (80 and 120m³/ha). Germination test with 2 seeds and different soils were carried out to determine the phytotoxic effect, concluding that high dosages had inhibitory effects but when diluted at proper dosages a stimulant effect on root growth and seed germination was obtained.

Concerning digestate's effect over soils, it was demonstrate that they tended to increase soil microbial biomass and activity, particularly when applied at high dose, being the intensity of this effect depending on soil and digestate characteristics.

Competitive position and advantages:

- The water and soil pollution derived from the 1 billion tons of waste oils generated every year in Europe could be significantly reduced by the proper treatment of the residues and by-products generated in their refining to produce biodiesel (1 l of waste improperly disposed could contaminate 1.000 l of water).
- The VALUVOIL system offers several advantages, through biofuel production, bio-products of use to the farming sector, and dramatic reductions in hazardous sludge requiring further treatment and safe disposal in landfill sites.
- Other advantages:
- Production of environmental friendly product with agricultural benefits.
- Boosting the oil recycling market and valorization of residues generated in other industrial processes.
- Diversification of agricultural market by introducing new environmental friendly bioproduct.

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