

EIP-AGRI practice abstract

Short title:

Technology for N recovery as ammonium sulphate from co-digestion of corn silage, chicken manure and other biowaste by BENAS process

Summary:

The BENAS biogas plant yearly treats more than 80 000 ton of crop, food waste and poultry manure and produced biogas, mineral N, calcium-carbonate and organic soil fertilisers. With a modified stripping process, it reaches a recovery rate of 80% of ammonia contained in the digestate, which is approximately 200 t/y. It requires the addition of Flue Gas Desulphurisation-gypsum (FGD-gypsum) to produce two marketable fertilizers: 25% ammonium sulphate (AmS) solution and solid calcium carbonate fertilizer (Lime, 70% DM). The productivity is AmS 5-40 t/d and Lime 1.5-14 t/d. The gypsum used for the process comes from FGD of coal power plants. It increases the soil pH, enhances nutrient availability without causing alkalisation, and also provides Calcium as an important plant nutrient. Moreover, the process does not require any external heat source and relies solely on the exhaust heat from the CHP engine, with an average consumption of 100 kWh/m³ of digestate.

The process further implements with the FiberPlus System has achieved the production of ammonia-free fibers suitable for different applications in the fiber and timber industries (i.e. fiberboard). Emissions and loss of N are reduced. Recovered nutrients in the system are 67% of NH₄-N as AmS and 6% of NH₄-N as Lime; 6% of P and 5% of K as fibers.

The BENAS technology also help to reduce the transportation costs and costs for storage of the digestate. This serves an important step for the waste treatment and for closing fertilizer loops.

For more information: https://nutriman.net/farmer-platform/technology/id_668