



**Geltz Umwelttechnologie  
GmbH**  
Kerschensteinerstraße 16  
75417 Mühlacker

[www.geltz.de](http://www.geltz.de)



### Contact

**Ulrich Geltz**  
Diplom Biologist  
Managing Director  
Phone: 07041/8299100  
E-mail: [ulrich.geltz@geltz.com](mailto:ulrich.geltz@geltz.com)



## Recycling of Manure and Fermentation Residue



### Background

### Solution

### Recycling

### The Current Situation

Manure and fermentation residue are applied on farmland as so-called agricultural fertilizer. The nutrients bound therein, especially nitrogen and phosphorus, are released to the crops. However, through intensive agriculture, overfertilization and groundwater contamination, this common practice has become an environmental problem. With the introduction of a new fertilizer ordinance in response to pressure from the European Union, the German government has passed the problem on to farmers: The amount and timeframe of manure application have been restricted, the bureaucratic effort augmented – manure and fermentation residue are increasingly turning into problematic waste.

### Our Background

As a wastewater and special plant engineering firm with a strong commitment to research and development, for over 8 years Geltz has been a partner to federal and European projects for the recovery of plant nutrients from agricultural residues. Using the experience gained, Geltz developed a **complete treatment plant** for targeted nutrient recovery and treatment, which purifies surplus manure from its raw state all the way to clean water.

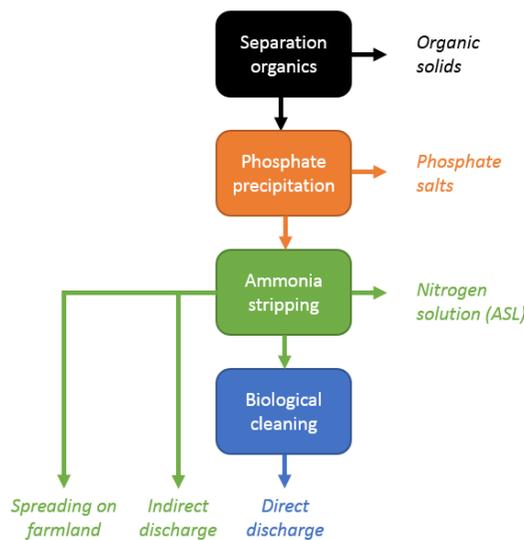
## Our Solution

The starting materials manure and fermentation residue consist mostly of biomass, phosphorus and nitrogen, which are almost fully **recovered**.

Pollutants such as heavy metals and resistant germs are **removed** or neutralised.

In the first step of the process, organic solids including bacteria are separated through several filtration stages. Due to its small quantity, the solid material can be **sanitised cost-effectively**.

In the second step, phosphates are chemically precipitated in an apatite-like quality.



Next, ammonium nitrogen is recovered as a high-quality ammonium sulphate solution (“ASL”), without the typical turbidity and impurity. After an additional biological cleaning stage to ensure the water quality, the residual water that has been removed is either directly discharged into watercourses, indirectly fed into a municipal sewage treatment plant, or, in line with the fertiliser ordinance, spread on farmland, according to the local conditions. The recovered raw materials are handed over to cooperatives and soil manufacturers for direct utilisation and to fertiliser manufacturers and the chemical industry for refining – the material cycle is closed in an environmentally friendly way.

Geltz currently operates a pilot facility with a throughput of **1 cubic metre of untreated manure per hour**. The next and final expansion stage is designed for a plant volume of 10 – 15 cubic metres of untreated manure per hour. This is distributed in collaboration with biogas plants in such a way that the regional demand for manure disposal can be met without significant transport costs.

*This project has received funding from the German federal ministry of education and research (Bundesministerium für Bildung und Forschung, BMBF) under grant agreement No 02WQ1360B*

## The Recycling Concept

