NP-BALANCE
Adaptation of fertilizers from biogas digestate

- The nutrient content in the digestate will be optimized by different techniques like co-digestion, recovery of phosphorous from reject water and digestate or added by addition of nitrogen.

- In field experiments and greenhouse experiments the plant nutrient utilisation of optimized digestate will be studied.

- The project is a collaboration between Novia University of Applied Sciences (Vasa, Finland) and the Department of Agricultural Research for Northern Sweden at University of Agricultural Sciences (Umeå, Sweden).

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Digestate as plant nutrient sources

Can we improve the nutrient balance in digestate before or after anaerobic digestion?

We will investigate:

- pre-treatment of organic substrates before digestion
- methane potential from co-digestion of different substrates
- phosphorous recycling by struvite precipitation from reject water and digestate
- optimize the nutrient balance by addition of stuvite / nitrogen rich substances to digestate

Agriculture

What is the best form for digestate?
Liquid or solid?
How important is soil incorporation?
What seasons is best for spreading?

We will investigate:

- uptake of nutrients and heavy metals in plants
- growth and harvest
- risk of leaching of nutrients
- risk of surface runoff of nutrients and heavy metals

Forestry

Which are the long term effects of digestate in forest?

In six 10-15 year old experiments we will investigate:

- risk of leaching of nutrients and heavy metals
- tree growth

Expected Results

1. Method of optimizing the nutrient balance in the digestate.
2. Method for the safe use of balanced biological fertilizer in agriculture and forestry.

The results will provide a basis for advice on how to use digestate to maximize the benefits and minimize the risks, with the goal to contribute to lowering of eutrophication in rivers, lakes and coastal areas.

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