

Agronomical performance and ecological effects of recycling-derived phosphorous fertilisers

The more nutrient cycles are closed locally, the better for the climate. Recycling-derived fertilisers are a good example. They are produced locally by innovative technologies and often have a similar fertilising effect to mineral fertilisers.

This was validated in the Interreg NWE-project ReNu2Farm, where agronomical and ecological effects were tested in the lab, pot and field. The phosphorous fertilisers examined were struvites from potato processing wastewater or municipal processing wastewater and ashes received from poultry litter or sewage sludge incineration or gasification.

Agronomical performance

In grassland and barley, struvites performed well compared to mineral phosphorous fertiliser use (such as triple super phosphate). The high calcium or aluminium and iron content could be the driving factors for lower phosphorus bio-availability of ash. Using these fertilisers in the field also taught us that homogenous spreading of ash is difficult due to the powdery texture.

Ecological impact

Neither ash nor struvite showed higher phosphorus residues in the soil after harvest. Concerning the impact on the soil environment, all struvites examined, as well as poultry litter ash, showed no impact. Sewage sludge ash, on the contrary, is not advised to use when it comes to soil life, as nematode communities' analyses have shown.

Conclusion

In summary, application of recycling-derived phosphorus fertilisers such as struvites instead of mineral fertiliser – in compliance with legislation – gives the same crop yield and no negative impact on the environment. The use of ash instead of mineral fertilisers is possible when it is used as a component in a fertiliser and safe use can be ensured.