

EIP-AGRI practice abstract

Short title:

Technology for P recovery as struvite starting from wastewater sewage with "PHORWater" controlled biological processes and struvite scaling process

Summary :

Several technologies are available for P-recovery at WWTPs, but none uses also the flows before the anaerobic digestion, thinking about the WWTP as a whole, considering biological processes and scaling problems. By controlling biological processes and struvite scaling, phosphorus recovery rate can be increased and avoid the operational problems due to scaling.

The innovation of PHORWater faces the problem from less to more; from optimization of the integral management to increase phosphorus availability and decrease uncontrolled precipitation of phosphorus, to a new simple-operational P-recovery reactor.

The obtained struvite (29% P₂O₅, 15% MgO, 5% N) is a potentially marketable product for the P fertilizer industry. Its slow release property avoids burning of plant roots, even if applied in excess quantities. Insoluble nature of struvite in neutral water prevents eutrophication and restricts leaching into groundwater. Regarding to impurities, the obtained struvite has less metal content than the phosphate rock, very low organic matter and less micro pollutants content than an anaerobic sludge. The struvite can be spread on the soil combined with other fertilizers or dissolved in a slightly acidic solution. It is highly recommended for cereal crops and grassland, but it is also useful on fruits, vegetables and root vegetable as potatoes.

At Calahorra WWTP, with a population equivalent of 70.000 p.e. (24.000 inhabitants), it can be recovered about 9 t/yr of struvite. The expected price would be about 200 €/t.

The application dose during the field trials was 921-1.170 kg/ha of struvite.

For more information: https://nutriman.net/farmer-platform/technology/id_207