Structure liming reduces phosphorus leaching from clay soils

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Objective:

To measure effects of structure liming on phosphorus (P) leaching in tile drainage.



Results

- Total P leaching was reduced in structure limed plots at both experimental fields.
- Particulate P leaching was reduced at the field with moderate/low soil test P and very high clay content.
- Dissolved P leaching was reduced at the field with high soil test P and moderate topsoil clay content.
- The effect of structure liming overrode the large spatial variation in P leaching, at the Bornsjön field.
- An improved aggregate stability was demonstrated for structure limed plots compared with untreated plots.

Conclusions

- 1. Structure liming is a promising measure for reducing P leaching on clay soils.
- 2. Both clay content and soil P status appears to be of importance for the P mitigation.
- 3. Additional long-term studies are desirable in order to estimate reliable cost-effectiveness.



Method and test sites



- Two experimental fields with separately tile drained plots.
- Four replicates per treatment.
- Water samples analyzed for total P, dissolved P and total N.

Bornsjön field

- Incorporation of CaO
- A six-year study.
- Cracking marine clay soil, 60% clay.
- Moderate/low soil test P
 - (32 mg kg⁻¹ P-AL)
- High ability to sorb P.
- Continious flow-proportional water sampling.

Wiad field

- Incorporation of Ca(OH)₂
- A two-year study.
- Clay soil, 25% clay.
- Relatively high soil test P (140 mg kg⁻¹ P-AL)
- Reduced ability to sorb P.
- Manual weekly water sampling of drainage water.



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