TOPSOIL AND SUBSOIL PROPERTIES
– Influence on phosphorus leaching from four agricultural soils

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AIM

- Determine P content, P binding and P release in topsoil and subsoil of four typical Swedish agricultural soils (two sandy and two clay soils).
- Examine variations in P leaching.
- Evaluate the influence of soil P and P sorption characteristics in topsoil and subsoil on P leaching.

CONCLUSIONS

- High sorption capacity in the subsoil was more important for P leaching than P content in the topsoil, especially on sandy soils.
- Topsoil studies are insufficient for determining P leaching in many soils.

MATERIALS & METHODS

- Undisturbed soil columns (0.295 m inner diameter, 1.18 m in length).
- Lysimeters were placed in an outdoor station where they were exposed to natural weather conditions.
- Leaching of P was measured during 21 months (August 2010 – April 2012).
- Chemical properties in topsoil and subsoil were determined.

RESULTS

- Small P leaching from the Mellby sand, despite very high P content in the topsoil, due to high sorption capacity in the subsoil.
- Much larger P leaching from the Nåntuna sand than from the Mellby sand, despite lower P content in the Nåntuna topsoil. The high P losses from the Nåntuna sand were caused by high P content and low P sorption capacity in the subsoil.
- Concentrations of DRP in leachate was lower from the Bornsjön clay than from the Lanna clay due to slightly higher sorption capacity and less macropore flow in the Bornsjön subsoil than in the Lanna subsoil.

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