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Ammonia volatilization, nitrogen in soil, and growth of barley
after application of peat manure and pig slurry

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Abstract

Peat is added to manure, because its low pH and capacity to adsorb ammonia (NH₃) give it potential to reduce nitrogen (N) loss. Peat manure was prepared by mixing pig slurry with moderately humified Sphagnum peat. Less than 1% of applied ammoniacal N was volatilized as NH₃ from peat manure and pig slurry within 8 h of surface application on clay loam soil according to JTI method. Incorporated manures showed even smaller N loss. The low volatilization was due to the adsorption of manure ammoniacal N by peat, and the infiltration of slurry into harrowed, moist clay soil. In another experiment, peat manure was applied on polypropylene fabric without soil contact. Within the first 3 days there was only 9% reduction in the ammoniacal N of peat manure, but the major part of it was lost during several weeks of dry and warm weather. Peat manure did not cause any major improvements on the growth and N uptake of spring barley in spring and early summer as compared with slurry. Moisture deficit limited the availability of ammoniacal N of manures. As compared with surface application, incorporation of manures increased nitrification of ammonium in the soil, and dry matter mass (19–73%) and N uptake of barley. Supplementing manures with inorganic NPK fertilizer increased both dry matter mass (40–98%) and N concentration of barley stand.

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