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SAARELA, INTO, SALO, YRJÖ, VUORINEN, MARTTI,

Effects of repeated phosphorus fertilisation on field crops in Finland 1.Yield responses on clay and loam soils relation to soil test P values

Keywords Acid ammonium acetate method, optimal soil test P, soil acidity, soil phosphorus,

Abstract

In order to update phosphorus (P) fertiliser recommendations for the Finnish clay and loam soils enriched with applied P, the effects of repeated P fertilisation on the yields of cereal and other crops were measured at eight sites over a period of 12-18 years. Yield results of some earlier field studies were also used in calibrating the soil test P values determined by the Finnish acid ammonium acetate method (PAc). Significant yield responses to P fertilisation were obtained on soils which had low PAc values or medium levels of PAc and too low or too high pH values (< 6.0 or 7.5 in water suspension). The mean relative control yield (RCY, yield without applied P divided by yield with sufficient P multiplied by 100) of the eight sites was 94.6% (n = 128, mean PAc 15.5 mg dm-3) varying from 87% at PAc 2.8 mg dm-3 to 100% at high PAc. A PAc level of 5-7 mg dm-3 was adequate for cereals, grasses and oilseed rape on the basis of the RCY value of 95% at optimal pH. At this PAc replacing the amounts of P in the crops (14 kg in 4 t grain) and the fixation of extractable P (about 6 kg ha-1 a-1) produced almost maximum yields in favourable seasons and were considered optimal.

Contact into.saarela@mtt.fi

[Full text] (PDF 500 kt)

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