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Monitoring of Finnish arable land: changes in soil quality between 1987 and 1998

Keywords cultivated soil, heavy metals, macronutrients, trace elements, soil monitoring, soil testing,

## Abstract

This study is part of the long-term monitoring of Finnish arable land and it is based on soil analyses of 705 monitoring sites in 1998. The same sites were sampled twice previously, in 1974 and 1987. We describe here the state of the Finnish cultivated soils and changes in soil quality since 1987. The samples were analysed for organic C, volume weight, pH, P, K, Ca, S, Mg, Al, B, Cd, Co, Mn, Mo, Se and Zn. Macronutrients were extracted with 0.5 M ammonium acetate + 0.5 M acetic acid (pH 4.65) and most micronutrients and heavy metals with the same solution + 0.02 M Na<sub>2</sub> EDTA. Hot water was used to extract B and Se. From 1987 to 1998, soil P, Ca, Zn, volume weight and electrical conductivity increased and soil K, B, pH and organic C decreased. There was no change in soil Ni. Between 1987 and 1998, the use of P, K, B and Cu in mineral fertilisers declined whereas that of Ca in liming agents and Zn in fertilisers increased. With the exception of P and Cu, these changes affected the concentrations of easily soluble macro- and micronutrients in the soil accordingly. The slight decrease in soil pH might be due to the increase in the use of fertiliser N. The finding that soil Cr ceased to increase and that soil Cr increased only slightly was attributed to the dramatic reduction in national emissions and depositions of heavy metals.

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