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Dissolved organic matter in surface runoff and drainage water from ploughed and directly sown heavy clay soil

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In Finland, clay soil erosion is a major source of phosphorus load from agricultural fields. Organic matter is known to stabilize the soil aggregate structure and therefore decrease the erosion of soil. To maintain the good structure and biological activity that are essential for the productivity of agricultural soil, farmers are encouraged to favour agricultural practices that mitigate the loss of OM or even increase the carbon content in soil. However, the effect of increase in OM content on the export of dissolved organic C, N and P (DOC, DON and DOP) is not well known. Reduced tillage has been recognized as an effective measure to reduce erosion and loss of particle bound phosphorus (P). However, in non-tilled soils, organic C tends to enrich in the surface soil which may affect the export of DOC and DON from soil to surface water. In this study, the loss of DOC and DON in surface runoff and drainage water is measured from ploughed and directly sown plots in an experimental field located in South-West Finland. All water draining from the field is conducted into flow measurement and the water sampling for the chemical analysis is done based on flow rate. According to the preliminary results from spring flow, the differences in DOC concentrations between the ploughed and directly sown plots were relatively small. Results showed differences between the tillage treatments in the partitioning of water between surface runoff and drainage water and that the export of DOC was largely controlled by discharge.