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## Effects of submerged drains to reduce subsidence of agricultural peat soils on nutrient loading of surface water

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In the Netherlands, about 9% of the area is covered by peat soils. Most of these soils are drained and in use for dairy farming. Drainage causes decomposition of peat by oxidation and consequently surface subsidence and greenhouse gas emission. Submerged drains that will enhance submerged infiltration during the dry and warm summer half year are regarded as a promising tool for reducing peat decomposition by raising groundwater levels. However, there appears to be some hesitation among water managers to deploy this tool because of fear of increasing nutrient loading of surface waters. Therefore, a modelling study was conducted for analysing the effect of submerged drains on nitrogen, phosphorus and sulphate loading of the surface water in peat land areas. Sulphate is nowadays recognised as a possible stimulator of phosphate mobilisation from the sediment to the water in the ditches. For the model analyses, characteristic 'peat land units' were determined, based on peat kind, thickness of peat layer, clay cover, hydrological setting (upward or downward seepage), quality of the submerged infiltrating water and ditch water level. Effects on nitrogen leaching were generally small to moderate, depending on conditions, effects on phosphorus leaching was in most cases a decrease, but effects on sulphate were mostly a (strong) increase of surface water loading. Thus sulphate appeared to be the most vulnerable nutrient for application of submerged drains. The impact on water quality and ecology is at present examined in the field, and will be further studied with surface water quality models.