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TRANSPORT OF DISSOLVED ORGANIC PHOSPHORUS (DOP) FROM SOIL TO SURFACE WATER ON HEAVILY MANURED GRASSLAND ON A SANDY SOIL

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Accumulation of soil P because of animal manure spreading from intensive livestock production is a serious threat to water quality in the agricultural regions in Flanders. The organic P in the soil solution accounts for the main fraction of P in the soil water. Certainly in sandy soils with low P sorption capacities and a shallow groundwater table, the subsurface transport of dissolved organic phosphorus (DOP) can be of great significance. The quantitative importance and potential mobility of DOP is known. But, despite the importance, its precise role in transfer to surface waters remains poorly understood. To investigate the DOP fluxes, a heavy manured grassland in the Campine region in Flanders is equipped with piezometers and suction cups. The field has a degree of phosphorus saturation of 45%. The field is drained by ditches that flow in a river next to the field. Concentrations of different forms of dissolved P (orthophosphate, colloidal and organic) were monitored each week in the groundwater, soil water and drainage ditches. Also, the water levels of the drainage ditches, the river and the groundwater were recorded with water level loggers. Together with the determination and modeling of the groundwater flow, a quantification on field scale was assessed of the different fluxes of phosphorus from the soil to the surface water. This research indicates that measures of phosphorus control should be specified on fields with unreactive soils and a high connectivity to surface water.