



Phosphorus retention and remobilisation in riparian vegetated buffer strips

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Riparian vegetated buffer strips are likely to become an important tool across Europe in the attempt to achieve Water Framework Directive (WFD) chemical objectives, especially for phosphorus (P), having been shown to reduce total P delivery. Uncertainties still remain about how vegetated buffer strips alter the delivery of dissolved and colloidal forms of P. The current literature suggests that retention of dissolved reactive P (DRP) is lower than for total P and in some cases delivery to surface waters has been increased. Increases in DRP delivery suggests remobilisation within buffer strip soils can occur and this is a concern as the WFD sets chemical objectives for P in terms of DRP. The aim of this study is to investigate the hypothesis that biogeochemical processes operating within buffer strip soils can alter the forms of P that are delivered to surface waters. This is achieved using a combined approach of a plot scale P form budget calculated from overland flow measurement, a soil survey across multiple established buffer strip sites, and a laboratory scale process investigation. Initial results from studies of P concentration in overland flow show a reduction in P delivery for all P fractions measured. Reduction of particulate P was greatest and resulted in an increase in DRP to total P ratio in overland flow from 0.17 in control plots to 0.27 in buffer strip plots. However, results from the laboratory analysis of buffer strip and field soils suggests that establishment of buffer strips on ex-arable land can, in the longer term, lead to a situation of increased soil P solubility. It is hoped that research in this area will contribute to a better understanding of how riparian vegetated buffer strips can be expected to function and to act as a tool in achieving future water quality objectives.