



Field testing of mitigation options for phosphorus and sediment (MOPS)

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Diffuse phosphorus (P) pollution, predominantly from agricultural sources (including fertiliser and animal waste), presents a serious problem in the UK contributing to the eutrophication of waterways and standing water bodies. Surface waters in the UK are strongly limited by P and even small additions can cause eutrophication. High inputs of P in the form of organic and inorganic fertilisers to agricultural crops have resulted in considerably higher levels of soil P than are utilised by the crop plants. This has led to a potential for the transfer of P to the wider environment.

Phosphorus losses associated with soil particles are often linked to soil erosion. There are a wide range of effective mitigation options for reducing soil erosion, however, much less is known about how effective these mitigation options are for reducing the P losses that are associated with sediment. This project focuses on a range of treatments with potential for reducing P losses associated with combinable crops. The treatments being investigated in this study reflect different levels of intervention. The treatments will aim to reduce sediment losses by reducing overland flow velocity, protecting the soil surface or managing soil structure.

Field experiments have been established at three contrasting sites in England. At the first site the soils consist of Hanslope and Denchworth series clays on an erodible slope. The second site is a silty clay loam of the Bromyard/Middleton series and the final site is a highly erodible soil with a high P content. The soils at this site are poorly structured sandy loam soils overlying compacted glacial till.

A range of treatments will be examined including minimum tillage, cultivation across the slope, tramline management, cover crops, crop residue management and vegetative

barriers. At each field site runoff from unbounded plots 12m wide and the length of the hill slope will be collected. Runoff will be collected in troughs towards the base of the slope and will run through pipes to sample splitters. The sample splitters enable us to collect between 50 and 12.5% of runoff depending on conditions. The runoff samples collected will be analysed for total P and total P <0.45mm.

The mitigation measures examined in this project will provide evidence to help farmers select the most suitable methods for mitigating losses of P from their land. It will also help funding bodies such as DEFRA to provide funding for farmers to undertake mitigation measures. Analysis will also look at the costs associated with introducing and maintaining the mitigations practices and the effect of adopting mitigation options upon economic land management.