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Identifying synergies between water resource protection and farm business objectives: the role of soil management

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We use a 3,000 ha BACI experiment on clay soils in central England as a focus for exploring synergies between Water Framework Directive targets for water quality (sediment, nutrients and pesticides) and crop production objectives of farm businesses. Based on base of catchment annual sediment loads, we estimate annual soil loss from farmland to be in the order of 0.3 – 0.6 tonnes per hectare. This has impacts on aquatic ecology, reservoir storage capacity and downstream flood risk through sedimentation of drainage channels.
Soil loss is relatively low in a European context but reflects poorly functioning soils with high runoff risk, and poor crop performance due to compaction, low organic matter, waterlogging, and competition from the grass weed, blackgrass (Alopecuris alopoides).
We use a range of mechanisms to increase farmers' awareness, understanding and motivation for improving soil management to meet multiple public and private benefits of soil function and present results for soil organic matter testing, earthworm surveying, and horizontal and vertical soil compaction mapping.