

A margin of error? Assessing effectiveness and placement of grassed and raised field margins to enhance multiple benefits

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Grassed field margins and riparian buffer zones have one of the highest uptake rates of any agri-environmental measure across Europe. However, progress remains slow in reducing catchment-wide agricultural diffuse pollution and storm runoff rates. Therefore, this measure needs to incorporate a greater range of technical advancements in order to further enhance the range of multiple benefits it delivers (e.g. management of hydrological extremes and soil erosion issues). There is a need to develop an evidence base for these enhancements at the headwater scales and generate guidance on placement and management of any modifications. In this presentation we demonstrate one such modification; the raising of field margins in specific locations through the creation of soil bunds to temporarily retain storm overland runoff. We highlight findings from two UK cases where grassed field margins/buffers are widespread. The effectiveness of some of these buffers for mitigating storm runoff rates is limited. In targeted locations soil bunds have been created to temporarily slow and retain storm runoff whilst still allowing landowners to farm the upslope landscape. The temporary storage areas hold approximately 200-400 m³ and are designed to drain within 6 – 18 hours to ensure the farmland is not inundated for long periods, reducing the need for any compensation payment. To enable more efficient targeting of these bunds we demonstrate a novel GIS framework that can be used in an engagement process with landowners to suggest measure locations, length of bund and storage volumes/footprints. Raised margins can achieve a greater range of benefits than grassed margin when targeted at key hydrological flow pathways, for example, local flood peak reduction and capturing significant amounts of sediment (which can later be re-applied to the upslope farmland). Observations of trapped sediment are providing powerful messages to farmers of how much valuable soil can be lost in a storm.