Reducing Soil losses from Arable fields

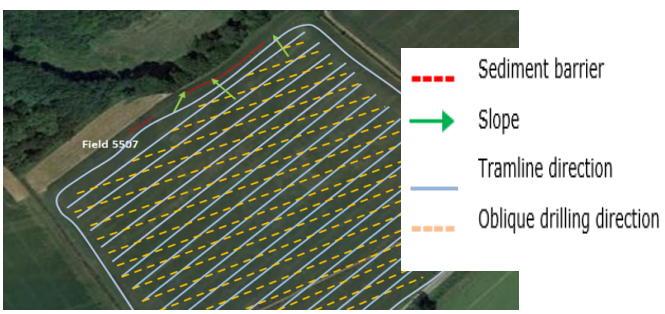
What is the issue?

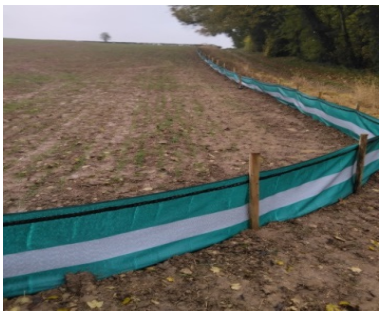
Sediment from agricultural fields can be lost into **nearby watercourses** due to **soil movement.** Sediment can carry with it phosphate which is adsorbed into the soil particles. The combination of sediment and phosphorous entering the watercourse can cause issues for the aquatic habitat of the watercourse via nutrient enrichment, turbidity and water quality and treatment.

What did we do?

Tramlines are one pathway that soil and associated pesticides and phosphate bound to the soil particles can be lost from a field. The severity of this depends on soil texture, for example with a silty –clay loam, the run off can be 20-40 times greater with suspended sediment (SS) and total phosphorus (TP) loss 300 times greater compared to a situation with no tramlines; clay soils have tend to have less sediment run off, yet adsorption of P and pesticides tends to be higher (MOPS1 and MOPS2).

To address this issue, an **oblique drilling trial** was carried out on two sloping adjacent fields in the Cringlebrook catchment, near Grantham next to the Cringlebook watercourse funded by the Environment Agency. **Oblique drilling** is where the drilling is done at a **small angle to the tramlines.** This creates **small loosened channels capable of then intercepting some water movement down tramlines**. This allows **water run off from the field to be channelled away from the normal tramline as well as having more chance of being up taken by the crop.** The presence of the crop itself in the tramlines also helps to further resist any surface water movement action.





To measure the amount of sediment loss from both fields, **two large, and one smaller sediment barriers** were set up on two sloping adjacent fields in the Cringlebrook catchment, near Grantham next to the Cringlebrook watercourse.


Above: down- slope tramline & drilling.
Below: drilling parallel to tramline, greater amount of surface water & movement

Figure1. Comparison of water movement in the tramlines of the conventional and obliquely drilled field on 25 October 2019

Soil expert Philip Wright helped design the trial and found the conventionally drilled field had more standing water in the tramlines and they were wetter and harder to work than the oblique drilled.

Overall the trial showed that the use of oblique drilling can reduce pathways of water and soil loss down tramlines – the next stage is to quantify the gross margin of this loss.

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