PINPOINT
Rivers Trusts and Farmers tackling water pollution

Best Practice Information Sheet

Association of Rivers Trusts
where there's water there's life

A clear solution for farmers
ENGLAND CATCHMENT SENSITIVE FARMING DELIVERY INITIATIVE

Farm advice on reducing diffuse water pollution from agriculture, delivered in partnership between Defra, The Environment Agency and Natural England

Soil management

Sheet 19.0a

Timeliness of operations

Why change?

Good soil management can help avoid loss of soil structure and maintain the long-term productivity of your soil resource. Timeliness of operations is key to ensure that the soil conditions are suitable for the machinery. It can save you money by ensuring a friable, easily workable soil and reducing the risk of:

- loss of soil, seed, fertilisers and pesticides
- extra field operations
- runoff, watercourse pollution and flooding.
- Damaging soil structure and crop growth

Wheeling damage on wet soil

Steps to success

1. **Review the current situation** by examining the programme of operations on your farm. Consider the timing of operations, and know the condition of the soils on your farm as well as the damage to the soil structure that poor husbandry could cause.

2. **Identify potential opportunities** for improving the timelines of operations on your farm. Look for evidence of soil erosion, soil damage and runoff, and consider how matching operations to soil and weather conditions could help minimise any problems and save you money. It is a requirement of cross compliance regulations that every farm in receipt of Single Payment Scheme (SPS) must complete and maintain a soil protection review (SPR).

3. **Prioritise erosion-prone soils and vulnerable crops**. Be aware of the variability of soils across your farm and their workability. For example, clay soils are easily worked for only a few hours after rain, particularly if they have been compacted or worked too wet in previous, ill-timed operations. Other soils may stay workable in all but the wettest conditions. Remember that good management of **all** soils on your farm through timeliness of operations is essential to the sustainability of your resource.

4. **Avoid**:

   - cultivation when soil is too moist to be friable. Wet, plastic soil can present an unfavourable environment for seeds and cultivation can cause compaction, smearing and capping leading to poor crop growth, reduced infiltration and increased runoff. Check soil wetness by digging a small hole before operations
   - trafficking on wet soil which can cause deep compaction that is difficult and expensive to correct
   - rolling wet seedbeds or land where there is a risk of forming a surface cap, and therefore soil erosion and runoff. It is advisable to avoid rolling after autumn drilling on vulnerable land, especially if soils are wet.

5. **Plan crop rotations and land use** to minimise the exposure of bare, vulnerable land to the erosive effects of rainfall. For example, maximise winter ground cover to protect your soils by drilling autumn crops such as winter wheat early. For whole crop forage maize, sow early varieties that can be harvested in early autumn.

6. **Monitor the success of timely operations**. Check your soils regularly during rainfall for evidence of erosion and damage. Look for brown water runoff, capping, compaction and rilling. Consider using best farming practices such as minimum tillage, catch crops such as rye grass following winter wheat and buffer zones to help protect soils where erosion and runoff remain a problem.

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Sheet 19.0b

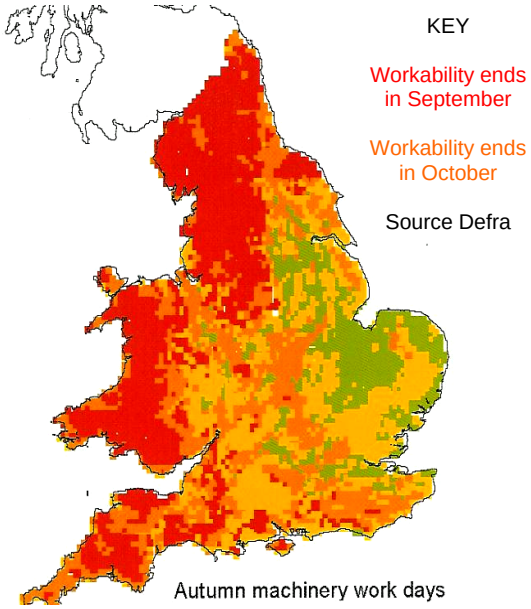
Timeliness of operations - Practical examples

Field capacity and safe access for cultivation

The field capacity period occurs when there is no soil moisture deficit. It generally begins in autumn and ends in spring.

The duration of field capacity is a useful overall indicator of the accessibility of machinery to land when used in conjunction with an awareness of local soil properties. During the period, cultivation has the potential to damage soil structure and promote soil erosion and runoff.

The period of time for the safe access of machinery to well-drained sandy soils and surface-wet clay soils can differ by as much as 80 days in autumn, and 40 days in spring. It is vital to consider the importance of soil type and conditions to the timing of operations.



Autumn machinery work days

Timely operations give savings

Timely soil management will help to improve its capacity to hold on to nutrients, break down pesticides and limit erosion, damage and runoff, with all the associated economic and environmental benefits.

In an example, to avoid compacting a wet clay soil, slurry was not spread on a 5 ha forage maize field during the winter months. To achieve this flexibility to spread when conditions were suitable the farmer ensured he had sufficient slurry storage.

The production of maize at 33% dry matter (DM) was 13 tonnes of DM per ha. At £800 per ha, the crop was worth £4000. It is estimated that soil compaction would have reduced yields by 25%. Good practice therefore saved the farmer £200 per ha, a total of £1000.

The payback was less than one year.


Undersown maize.

Remember

- Timing of operations is central to maintaining soil structure, minimising soil loss and optimising productivity.
- Forcing a seedbed in poor conditions is usually a false economy. Wait until soil moisture conditions are right.
- If soil erosion and runoff from your farm causes water pollution you could be liable to prosecution costs and fines under the Water Resources Act 1991.

For further information: Defra (www.defra.gov.uk), Environment Agency (www.environment-agency.gov.uk), ECSFDI (http://www.defra.gov.uk/foodfarm/landmanage/water/csf/delivery-initiative.htm), Natural England (www.naturalengland.org.uk), Cross Compliance Helpline 0845 345 1302 (www.crosscompliance.org.uk) and ART (www.associationofriverstrusts.org.uk)

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This information sheet is part of a series providing farmers with advice on land management practices to protect water bodies, produced by Association of Rivers Trusts with support from the England Catchment Sensitive Farming Delivery Initiative. The advice will also enable farmers to use farm resources more efficiently and help meet Nitrate Vulnerable Zone and Soil Protection Review requirements under Cross Compliance and environmental regulation.

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