

Briefing for farmers and land managers about soils and flooding

Expert Panel

- **Prof. David Robinson**, Soil Scientist, UK Centre for Ecology & Hydrology
- **Dr. Richard Smith**, Technical Specialist, Environment Agency
- **Prof. John Boardman**, Environment Change Institute, University of Oxford
- **Dr Alejandro Dussailant**, Civil Engineer and Hydrologist, UK Centre for Ecology & Hydrology

1. **Identifying and understanding different soil types** and associated properties is critical to adapting management and reducing flood risk through maintaining and optimising soil structure, water infiltration and water holding capacity.
2. **Soil structure controls runoff and resilience to rainfall.** Well-structured, freely draining soils can absorb heavy rainfall, while compacted soils with poor structure (often hidden in the subsoil) can turn otherwise free-draining land into major sources of runoff, erosion, and muddy flooding.
3. **Management practices strongly influence flood risk.** Trafficking on damp soils and across the whole field instead of within limited tracks, poor timing of operations, late harvesting, compacted seedbeds, outwintered stock, winter manure or slurry spreading, and poorly structured grassland soils all increase the likelihood of surface-water flooding in high-risk locations.
4. **Erosion and muddy flooding follow clear risk factors.** Problems do not occur at random. They are linked to highly erodible soils, high rainfall areas, risky crops (such as potatoes, maize, and winter cereals), steep slopes, and farming practices.
5. **High-risk cropping increases scrutiny.** Repeated planting of risky crops on steep or sensitive land leads to repeated erosion events, increasing environmental impacts and negative attention on farming practices. There are regulatory controls in England dealing with soil erosion and water pollution.
6. **On-field actions can cause off-farm impacts.** Many eroding fields are hydrologically connected to watercourses, meaning soil erosion can directly lead to downstream flooding and pollution, sometimes aided by ditches, drains, and hedges acting as conduits, as well as slope-oriented tracks.
7. **Improving soil condition brings multiple benefits.** Applying best management, minimising traffic across the whole field, and identifying and remediating compaction can improve yields, increase workable days, and reduce runoff, erosion, and nutrient loss. Cropland soils appear stable or improving in organic matter alongside reduced compaction. Benefits can include also better resilience to droughts.
8. **Remediation must be soil-specific and context-specific.** Effective responses depend on soil type and may involve changes in crop choice, subsoiling, tillage, drainage, crop cover, and stock management. Solutions are site specific.
9. **Long-term and regenerative approaches are effective.** Correctly placed and maintained buffer strips, earth dams, crop choice, cover crops, controlled traffic, and regenerative agricultural practices in general can significantly reduce runoff, soil losses, waterlogging, and improve soil health, with some benefits seen within a few years in some cases.