

# Managing soils for a sustainable future



UK SOIL HEALTH  
**initiative**

**CFE**  
Championing the  
Farmed Environment



# First steps for improving soil health

Well managed and functioning soils are the foundation for all production systems. Soils with good structure that contain diverse and abundant flora and fauna, which can provide the nutrients plants need to grow, form essential building blocks for productive farms. Such soils are best able to support good yields and reduce the risk to the environment through unnecessary losses to air and water.

There is no one-size fits all blueprint to improve soil health. Effective soil management must build on existing practice, your farming system, soil type, climate, cropping etc. There are options for all farmers to enhance both productivity and soil health.

Working together across the agri-industry, the UK Soil Health initiative and Championing the Farmed Environment seek to help farmers and growers understand how to best manage soils for both improved productivity and increased sustainability, based on healthy soils.

Although managing soils well can be confusing and complex, this guide brings together some initial steps that can be implemented across all farming systems and will help you understand your soils and plan your first steps to improving soil health.

		Everyone should:	Going beyond the norm might mean:
<b>Know your site and soils</b>	Understanding the soils you have across your land and how factors such as the slope and proximity of water can influence the risks will help you to plan the right options. As importantly, it will highlight what techniques might not suit your soils	<ul style="list-style-type: none"> <li>• Know soil texture (including subsoil)</li> <li>• Know the land use constraints and their variability – hydrology, slope, erosion risk</li> <li>• Understand the context of your land, are you in an NVZ, are there issues with sediment or P in the area? Are there drinking water issues? Are there catchment scale issues, eg NVZ, diffuse P risks?</li> <li>• Record your soil observations/data so you can refer back to them easily</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure everyone on the farm understands the importance of soils</li> <li>• Develop the on-farm skills to understand your soil management</li> <li>• Spend time in peer-to-peer learning and engage in research</li> <li>• Monitor the system as a whole eg production, crop quality, water quality etc and use the information</li> </ul>
<b>Crop management</b>	Having a more diverse rotation can support soil health improvement. Crops that support/replenish soil structure, organic matter and nutrient balance within a rotation will help improve your soils	<ul style="list-style-type: none"> <li>• Use a rotation of at least three crops</li> </ul>	<ul style="list-style-type: none"> <li>• Target fungicide, herbicide applications – using precision approaches</li> <li>• Maximise cropping diversity – extend the rotation</li> <li>• Introduce (diverse) leys into the rotation</li> <li>• Improve cropping system designed to increase pollinators</li> <li>• Use cover cropping to improve soil structure and manage pests</li> <li>• Introduce legumes into the rotation</li> <li>• Introduce trees as shelter belts, hedges and consider integrated agro-forestry</li> </ul>

		<b>Everyone should:</b>	<b>Going beyond the norm might mean:</b>
<b>Optimise nutrient management</b>	<p>Understanding your existing soil nutrient levels will help to apply the right nutrients in the right quantities. This will ensure optimum growth as well as reduce risk of losses. Ultimately good nutrient management saves both time and money ensuring good returns while controlling pollution</p>	<ul style="list-style-type: none"> <li>• Use soil testing regularly (pH, P, K, Mg) to optimise fertiliser and lime use</li> <li>• Use robust information to aid nutrient planning e.g. Nutrient Management Guide, Tried and Tested</li> <li>• Maintain pH (liming/gypsum as needed)</li> <li>• Match fertiliser type to soil type to increase N use efficiency and minimise ammonia emissions</li> <li>• Select best practice application methods to match manure/organic material and soil types</li> </ul>	<ul style="list-style-type: none"> <li>• Implement enhanced monitoring of soils – not just pH, P, K – and use the information</li> <li>• Take a wider approach to crop nutrition than just NPK</li> </ul>
<b>Improve soil physical condition</b>	<p>Well structured soils which are free from compaction will usually be free draining and will support good plant growth, can help minimise the impact to flooding and drought and will help to minimise erosion and loss of your soils.</p>	<ul style="list-style-type: none"> <li>• Ensure drains are present and maintained where needed</li> <li>• Assess soil structure – regular visual inspection such as the Visual Evaluation of Soil Structure (VESS)</li> <li>• If you cause damage, implement remediation</li> <li>• Use lightweight vehicles wherever possible</li> <li>• Minimise compaction – use appropriate tyres and tyre pressures</li> <li>• Assess soil conditions regularly when cultivating, and stay within the workability window</li> <li>• Minimise/optimize cultivation intensity – you will need flexibility season by season</li> <li>• Take a targeted approach to address compaction through sub-soiling as needed in the right conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Introduce conservation agriculture (zero tillage plus continuous cover)</li> <li>• Consider controlled traffic approaches</li> </ul>
<b>Manage run-off in the field</b>	<p>Water flowing across your fields is the primary way that soil erosion will occur. It will also transport nutrients and pesticides away from where they are of most value to you. Taking action to reduce run off helps avoid all these losses and keeps the soil where it is most useful to you – in your field.</p>	<ul style="list-style-type: none"> <li>• Incorporate designed buffer strips alongside watercourses, ditches and hedges</li> <li>• Minimise run-off/erosion risk through consideration of the direction of cultivation</li> <li>• Capture run-off and sediment in field</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise run-off/erosion risk through strip tillage and/or under-sowing</li> </ul>
<b>Maintain soil organic matter and biological activity</b>	<p>Soil organic matter and biology are crucial to many aspects of soil health. They help the physical and chemical processes in the soil making it more resilient to waterlogging, compaction and also support better nutrient cycling and availability.</p>	<ul style="list-style-type: none"> <li>• Keep soil covered during the winter period, wherever possible – no bare ground</li> <li>• Incorporate crop residues wherever possible or return via manures</li> </ul>	<ul style="list-style-type: none"> <li>• Add off-farm organic matter (sludges, digestate, compost)</li> <li>• Make Organic Matter measurements – understand results and take necessary action</li> <li>• Track your field's biology – count earthworms</li> </ul>



## Working in partnership



Encouraging farmers and land managers to protect and enhance the environmental value of farmland alongside productive agriculture.

Protecting wildlife, protecting natural resources, enhancing biodiversity.

Championing the Farmed Environment partners – Agriculture & Horticulture Development Board, Agricultural Industries Confederation, Association of Independent Crop Consultants, Central Association of Agricultural Valuers, Country Land and Business Association, Environment Agency, Game and Wildlife Conservation Trust, Linking Environment And Farming, Natural England, National Farmers Union, RSPB, The Wildlife Trusts, Water UK – working in partnership with Defra.



## UK SOIL HEALTH initiative

The Soil Health initiative aims to bring together the wealth of understanding of soil health and management to help farmers improve their soil health and thus productive farming alongside environmental benefit.

**The information in this leaflet is generated from a workshop which involved:**

ADAS, Agrovista, AHDB, AIC, Agrii, Anglian Water, British Grassland Society, Centre for Ecology and Hydrology, CF Fertilisers, CLA, Cranfield University, East of England Agricultural Society, Environment Agency – soils, Gs Growers, Game and Wildlife Conservation Trust, Hillcourt, Hutchinsons, Innovation for Agriculture, James Hutton Institute, Lancrop/Yara, NIAB, NFU, National Trust, Natural England – Catchment Sensitive Farming, Organic Farmers and Growers, Royal Agricultural University, SRUC, SectorMentor, Sustainable Soils Alliance, and the Universities of Lincoln and Sheffield.



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The information in this leaflet should be used in conjunction with the CFE leaflet 'Soil Management for your farm business'