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SUSTAINABLE SOILS ALLIANCE

Soil Management Guidance in England:

Recent history, Current state of play and Recommendations for the future

Incorporate the principles and practices of sustainable soil management into policy guidance and legislation at all levels of government, ideally leading to the development of a national soil policy.

Recommendation V (governments) in the revised FAO World Soil Charter

Introduction

Historical context

Guidance on the management of soil, a farmer's most important asset, goes back as long as farming itself. The oldest surviving Chinese agricultural treatise, *Essential Techniques for the Peasantry* (535 A.D) showed landowners how to improve their estate (including soil) management through the advice they gave to their tenants.

In this country, soil management has been central to many of the critical chapters in farming evolution – the Norfolk Four Course rotation, introduction of nitrates in the 19th Century, adoption of the seed drill etc, however, these developments were achieved by informal and peer-to-peer knowledge exchange. It was only in 1890 that public funds first became available for agricultural education in England and Wales and modern agricultural 'extension' - the formal application of science in agriculture began. The term extension was replaced with a government-sponsored advisory service in the 20th century.

Since then, the type, aim and content of soils guidance has evolved. To begin with, it lay exclusively in the realm of chemistry, before expanding into physics and bacteriology in the 1930s. The objective of soil guidance originally aimed exclusively to improve soil's agricultural potential, but more recently expanded to cover its broader environmental impact - coinciding with an understanding of soil health according to defined functions and characteristics. Technological advances mean that soil guidance now covers techniques for the measurement of soil health as well as interventions to manage, restore and improve it.

Current context

This analysis of current soils guidance focuses on the modern era, essentially since farming's environmental impact started to be taken seriously by policy-makers and the introduction of cross-compliance into the Common Agriculture Policy (CAP). It is framed by the **environmental and economic need** and the **policy opportunity**.

The **need** is summarised by the Royal Agricultural Society of England in its report: The Current Status of Soil and Water Management in England:

Agricultural production in general and soil and water management in particular, face a considerable challenge in meeting the demands of i. increasing food production and security at both national and international level, ii. the demand for alternative fuels, iii. climate change, iv. soil protection, v. flood and pollution control and vi. the availability of water resources for crop and animal production combined with the diminishing supply of labour.

The **opportunity** is provided by the UK's departure from the EU and with it the payment structures of the Common *Agriculture Policy (CAP)* and the obligations of the various Framework Directives (some of whose

targets are enshrined in UK law, however). Leaving the EU requires and enables the four nations of the UK to design and develop their own strategy for achieving sustainable farming with soil at their heart.

In England, the draft 2020 Agriculture Bill included practices that protect and improve soil leading to the delivery of public goods among the actions it will pay for under Environmental Land Management (ELM), the scheme that will replace CAP. A critical watershed moment for soil health, but one requiring a careful understanding of the elements – regulations, enforcement, guidance etc that must sit alongside financial incentivisation to drive genuine change.

Aims and objectives

The 2020 ELM Discussion Document envisages 'Guidance' and 'Advice' being incorporated into every step of the ELM process. This includes the need to *make sure we give farmers clear guidance on what they need to do in order to deliver environmental outcomes while keeping their financial and delivery risks low.* For the sake of this document, Guidance is written down in a leaflet/booklet/digital format as opposed to advice which is delivered in person.

This project was designed to inform the process of soil guidance development with ELM in mind. It comes in two parts: A spreadsheet of some of the soil guidance current in widespread use alongside the date, agency/ organisation responsible, source and key elements. This will be searchable on the SSA website and regularly updated with new and recent guidance as we discover it.

This second element is a narrative backgrounder to the spreadsheet – explaining the policy context and the range and variety of organisations –'official' (governmental/agency) and unofficial who have drafted their own versions of soil guidance – and their motivation (policy and outcome) for doing so.

We conclude with some observations about the content and quality of this guidance and what this means for those responsible for developing materials to support ELM, and more broadly, post CAP soils policy.

1. *Cross Compliance*

Soil wasn't properly embedded in the Common Agriculture Policy (CAP) until the 2005 reforms and the introduction of cross-compliance, a compulsory measure which sets environmental and other standards that farmers must adhere to in order to receive their Basic Payment Scheme (BPS) subsidies.

To receive their BPS, farmers had to demonstrate that they were keeping their land in Good Agricultural and Environmental Condition (GAEC). Three protection standards (GAEC 2-4) related specifically to soil: GAEC 2 (Post-harvest management of land after combinable crops), GAEC 3 (Waterlogged soil) and GAEC 4 (Burning of crop residues).

At the time, this was considered a watershed moment for soil. The trade journal Farmers Weekly heralded the CAP reforms '*Farmers have been warned they must wake up to soil management or risk losing their Single Payment Scheme'*, however DEFRA acknowledged that GAEC measures represented a significant step for some farmers: '*We recognise that the development and implementation of a risk based soil management plan. We will achieve this if we develop first the knowledge base and understanding of farmers /land*'.

With this in mind in 2005 Defra developed the Single Payment Scheme Cross Compliance Guidance for Soil Management.

This Guidance provided practical illustrated guidance on how to achieve the relevant soils standards. It introduced the concept of heavy/light/medium soils and peat and raised the challenge of compaction. It also acknowledged a high level of variability in farm types and practices, landscape, climate and soil type – all of which made defining a set of national standards difficult: *'We do not propose this prescriptive approach but an individually tailored risk based Soil Management Plan (SMP) produced by each farmer. The SMP approach will require farmers to understand and analyse risk on their farm prior to undertaking measures that target a practical problem. It allows farmers some choice selecting measures appropriate to their situation.'*

The Soil Management Plans (later called the CC Soil Protection Review) was developed to reflect everything farmers were doing for their soil, and consisted of three elements: identifying soil issues, deciding on measures to manage and protect soils and reviewing success. Whilst it may not have been the wake-up call originally foreseen, it was at least enforced. Failure to provide an RPA inspector with a Review within 30 minutes of an inspection had the potential to land farmers with a 3% fine of their Single Payment.

The last Soil Protection Review was published in 2010.

2. Soil Protection Standards

The GAEC requirement to complete and retain a Soil Protection Review was replaced with a new set of national minimum standards from 1 January 2015. The new 'outcome-based' approach was supposed to be less bureaucratic and less onerous for the farmer - farmers were encouraged to do - rather than report on what they had done.

Under the scheme RPA inspections for every farmer receiving BPS or Environmental Stewardship inspection from 2015 would be based on visual inspection rather than paperwork checks and recording of plans. Payment reductions could be applied if farmers did not comply with the new Soil Protection Standards which included elements of the Soil Protection Review book and incorporated other elements of previous cross compliance requirements, namely:

- Take all reasonable steps to protect soil by having minimum soil cover unless there is an agronomic justification not to or where establishing a cover would conflict with requirements under GAEC 5 (GAEC 4)
- Manage your land to minimise soil erosion (GAEC 5)
- Use appropriate practices to maintain the levels of organic matter in soil (GAEC 6)

3. Environmental Stewardship

Farmers who wanted to take their environmental management further than the baseline outlined for Basic Payments – and be paid for it, could take part in Environmental Stewardship, an agri-environment scheme run by DEFRA in England which was formally launched on 18 March 2005, although the first agreements did not start until 1 August 2005.

Environment Stewardship has a number of soil-relevant objectives:

- Improve water quality and reduce soil erosion – by encouraging management which can help to meet these aims;
- Improve conditions for farmland wildlife – including birds, mammals, butterflies and bees;
- Maintain and enhance landscape character – by helping to maintain important features such as traditional field boundaries;
- Protect the historic environment – including archaeological features and artefacts.

This stewardship has its own accompanying guidance (2010) which were required to help farmers meet the requirements for an Entry Level Stewardship (ELS), Organic ELS, Uplands ELS or Higher Level Stewardship agreement.

This included the Soil Management Plan (a more detailed assessment than the Review), a voluntary option that contributes 3 points/ha towards farmers' ELS or OELS points targets. To enter ELS/OELS farmers had to prepare a Farm Environment Record, which included fields at high risk of soil erosion using a simple key.

The overwhelming focus in Environmental Stewardship was on biodiversity and diffuse pollution**.** Measures on soil management were included in these schemes but only as an adjunct to dealing with these other ambitions

4. Defra Codes of Good Agricultural Practice

Alongside rules relating to cross-compliance and stewardship, there are codes of practice to help farmers protect their land and the environment from pollution. Guidance of good practice for soil sits in The Code of Good Agricultural Practice on Protecting our Water, Soil and Air (2009). It describes key actions farmers can take to protect and enhance the quality of water, soil and air and, in some cases, achieve cost savings for their business.

The codes are not law, however, compliance be taken into account in any legal proceedings following a pollution incident and to clarify farmers' legal obligations, including those relating to cross compliance.

The Code replaced the separate Water, Air and Soil Codes published by the Ministry of Agriculture, Fisheries and Food and the Welsh Office Agriculture Department, which were last revised in 1998.

This Soil Code (the Code of Good Agricultural Practice for the Protection of Soil) was a practical guide to help all farmers and growers avoid causing long-term damage to the soils which they farm. It was comprehensive – covering construction, organic matter, tillage etc, but awareness of the code among farmers was low (surveys at the time revealed very few (5%) of farmers read it).

Ultimately the soil code was superseded by the 2009, broader agricultural code because of the arrival of the EU Directives for air and water – and the need to achieve those specific targets.

5. EU Framework Directives

Recent EU water policies (Water, Floods, Groundwater, Nitrates Directive; Water and Pesticides Directives etc) have been critical drivers of UK farming and environment policy because of their capacity, especially the WFD, to impose hefty fines on the UK and accountable water management bodies for failure to meet their legal targets

While these policies have implications for soil, they treat it largely as a pollution prevention medium.

To help meet WFD targets and facilitate the delivery of Agri-Environment Scheme objectives for water quality the government launched the Catchment Based Approach (CaBA) in England in 2013. It looked to embed collaborative working at a river catchment scale through community partnerships, bringing local knowledge and engaging more than 1500 organisations.

This in turn has generated a great deal of guidance, both nationally and locally applicable. The most well-known example is the Catchment Sensitive Farming (CSF) scheme administered by Natural England which has a programme of advisory work on soils and water areas and publishes a series of supporting documents.

For soil, the relevant materials are: Farming for cleaner water and healthier soil (2010), and Farming in the uplands for cleaner water and healthier soil however as the titles – and objectives (*improve the quality of water and soil on your farm by tackling soil erosion and runoff at the source, slowing the pathways and protecting watercourses and other receptors)* makes clear, their desired outcome is clean water rather than healthy soil – for soil's sake.

6. NGOs

NGOs are critical providers of soil advice and guidance. Historically their focus has been on biodiversity, peat, wetland, upland and trees – and on helping farmers comply with regulations and cross-compliance, although recently there has been greater interest in soil organic matter because of carbon and the need for nature-based solutions to climate change – specifically through minimal tillage. Examples of this guidance includes:

- Farming and Wildlife Advisory Group (FWAG) help farmers comply with GAEC rules through their Soil Management Plans and provide flood management information through Soil Husbandry Advice.
- LEAF (Linking Environment and Farming) have developed 'Simply Sustainable Soils': six Simple Steps to help farmers improve the performance, health and long-term sustainability of your land
- Championing for the Farmed Environment (CFE) have published two guides - 'Soil management for your farm business' and 'Managing soils for a sustainable future'

While these initiatives have been critical for driving knowledge and awareness of soil health, soil is not at the heart of these organisations' principle objectives, and the advice they give either follows the lead of the existing policy frameworks or can prioritise outcomes (biodiversity, diffuse pollution) rather than soil in itself, leading to unintended consequences for soil health. This might include prioritising nature-reserve and woodland management in winter (to protect nesting birds) when soils are most vulnerable for example to compaction, or an over-emphasis on the universal benefits of minimum tillage agriculture.

7. Assurance schemes and the organic and regenerative movements

Soil is naturally central to organic farming, which covers around 2% of the UK, and the Soil Association has advised on soil health throughout the 70 years of its existence. Today, the Soil Association has a page of resources (Guidance, case studies etc) addressing many of the critical aspects of soil within its organic management assurance scheme, including systems design, rotations, cover crops & green manures and how to enrich soil with organic amendments.

The other widely available accreditation scheme in the UK is Red Tractor, which requires scheme participants to complete and record a field by field soil management plan (template provided). This consists of identifying field characteristics (risk of runoff and erosion etc), specific management issues (compaction etc), any management proposals (increase soil organic matter etc) and noting any soil issues that arise during the year for annual review.

To support decision making, Red Tractor doesn't provide its own Guidance, but instead promotes the document 'Protecting our Water Soil and Air – A code of practice for farmers growers and land managers'.

Recent years have seen the birth of the regenerative farming movement which pursues farming and grazing practices that, among other benefits, looks to reverse climate change by rebuilding soil organic matter and restore degraded soil biodiversity – resulting in both carbon drawdown and improving the water cycle.

One consensus among regenerative farmers is that there is no blueprint for the process, meaning it does not lend itself logically to written guidance. Instead, farmers are encouraged to find ways of making it work on their own farms, learning from each other and from their mistakes. Instead of developing guidance, Base (Biodiversity, Agriculture, Soil and Environment) which formed eight years ago and is the focal point of the movement provides members with a reading list of suggested books to aid their knowledge and understanding.

The Groundswell event provides a forum for farmers and anyone interested in food production or the environment to learn about the theory and practical applications of Conservation Agriculture or regenerative systems, including no-till, cover crops and re-introducing livestock into the arable rotation, with a view to improving soil health. This brings with it its own challenges in that compaction deeper down the soil profile can be overlooked in favour of organic matter in the topsoil and nuances of soil management can be forgotten in the eagerness to find a one-size-fits-all solution.

8. Industry/Levy Boards

The levy boards are producer-led statutory bodies whose role it is to help promote their industry, by offering training and education to farmers, promoting R&D and encouraging knowledge transfer. They look in particular to offer services that neither the government nor the market does not.

The three British levy boards Agriculture and Horticulture Development Board (AHDB), Quality Meat Scotland (QMS), Hybu Cig Cymru/Meat Promotion Wales (HCC) have all developed guidance for soil management:

- Better soil and grass management for Scottish beef and lamb producers (Quality Meat Scotland)
- Getting the most from your soil (Hybu Cig Cymru)

In England, AHDB has a long history of providing farmer-targeted materials and has recently begun to bring together material across sectors via Great Soils, an extensive programme of research and knowledge exchange on soil management culminating in practical information, case studies, guidance on particular aspects of soil health and a scorecard which helps farmers understand and evaluate *the chemical, physical and biological properties of soil.* Materials include a Drainage guide (re-issued in 2019), a Crop Establishment /cultivation

guide (new in 2020), Principles of Soil management (also 2020, which brings together foundational material for cross-sector use) and the Healthy Grassland Soil (scoring sheet) and associated pocketbook.

Great Soils is professional, comprehensible and has extensive reach with farmers. However, in contrast to many of the NGO-driven Guidance documents, Great Soils focuses (understandably) on agricultural productivity rather than compliance, stewardship and the environmental impacts associated with soils.

Soils information is closely linked with nutrient management. The AHDB Nutrient Management Guide (RB209) offers best practice guidance on the application of fertilisers and organic materials to crops and grassland. In Scotland, this service is provided by Scotland's Rural College (SRUC) which produces Technical Notes with funding from the Scottish Government. These are grouped under headings including soil management and fertility, or fertiliser application recommendations.

Finally, Tried & Tested is an initiative developed by the agricultural industry (NFU, CLA etc), designed to help farmers to boost profitability and reduce nutrient waste and environmental impact by improved nutrient management planning through a toolkit of resources and guidance, e.g. through the Tried & Tested paper-based nutrient management plan.

9. Corporates:

The food supply chain has a growing interest in soil health – to guard against long-term supply chain disruption (especially caused by extreme weather events), for ESG (environmental, Social and Governance) purposes and because of soil's potential to contribute to Net Zero targets.

This has seen them enter into collaborations with local catchment schemes, NGOs and other stakeholders to promote soil health in their supply chain. Examples include:

- The Soil Health Assessment Guide Designed and produced by NIAB in association with the Cambridge Institute for Sustainable Leadership (CISL) and ASDA.
- In collaboration with the Game & Wildlife Conservation Nestle has developed an innovative scheme, whereby the farmers that supply its milk choose from a range of practical sustainable dairy farming interventions, (including soil management) in exchange for financial incentives.
- Yorkshire Water and food supply chain consultants, Future Food Solutions, have developed an innovative farming programme driving the improvement of soil health on arable farms, and specifically to help increase soil organic matter to make farmland more sustainable and resilient to future climate demands

Observations

As well as a quick summary of available soil management guidance documents and the range and variety of responsible organisations behind them, the narrative above looks to demonstrate the crucial connection between the development of soils guidance and the policies that motivated them in the first place. Some common trends between them can be observed:

- **Political vacuum**: For a generation, environment policy has been driven by EU Directives (Air, Water etc) which gave the EU the power to fine Member States for non-compliance and failure to hit targets. The threat of fines provided the impetus for policy intervention, targeted mechanisms (education, regulation, guidance etc) and most critically - investment.

  Soil has never had the benefit of such an urgent policy impetus. Knowledge exchange and best practice had been a pillar of the proposed EU Soil Framework Directive and may well have been a driver for a national soil guidance, but it was pulled off the table in 2017 – the only EU Directive ever to be withdrawn in this manner.

- **By-product of existing Guidance:** Where Directives generated guidance that touches upon soil (Water, Nitrates etc) their impact has been indirect - treating soil as a proxy for other outcomes (biodiversity, diffuse pollution etc). Recommended interventions have been skewed towards these specific aims and outcomes, never soil health in the round.

- **A piecemeal approach:** The transposition of EU targets into national policy can lead to watering down and loss of focus as it passes through legal and technical interpretation. This was the case with EU soil

policy under CAP, and specifically its three priority themes – erosion, organic matter and crop cover. The implementing national policy (GAEC) achieved the necessary legal compliance with the overall framework, but by narrowing the scope down to three specific 'incidents/risks' - *post-harvest management of land after combinable crops, waterlogged soil* and *burning of crop residues*, resulted in an essentially piecemeal, rather than holistic, strategic approach.

- **Contrasting agendas:** Much NGO Guidance is equally siloed - often through the prism of a particular outcome or avoidance of a practice that reflects that organisation's overriding objective. This might include an over-emphasis of soil management in winter (so as not to disturb birds), arguing against minimum tillage (due to hostility towards Glyphosate) or in favour of minimum tillage (biodiversity benefits).
- **Victims of reforms:** Soil has also been the victim of policy reforms, and the transferal between policy mechanisms. Following CAP review, area reviews were replaced by single payments and soils pushed into cross compliance. Later soil came under environmental stewardship which was dominated by biodiversity and diffuse pollution. The replacement of Soil Protection Reviews with the 'less bureaucratic' minimum standards was a retrograde step. At every step, soil guidance and advice has been diluted, repackaged or deprioritised.
- **Different agencies:** Soil also suffers from being the responsibility of different government agencies. The Environment Agency (the body responsible for environmental enforcement) deals with water and contaminated land but has very little direct remit when it comes to soil (other than through water). The Rural Payments Agency is responsible for cross-compliance. Natural England deals with ag-envi/ stewardship payments. It is Defra's role to develop official guidance.
- **Geographic variation:** The catchment approach is largely driven by the Environment Agency and NGOs, often with local knowledge and experience developing projects and drawing down money to solve land-water problems. However, the focus on soil can be inconsistent and disjointed from one region to the next - with duplication of information and varying degrees of skills and capacity about soil knowledge.
- **Regulatory grey area:** Finally, there is the issue of regulatory compliance, and the crucial grey area between practices that are non-compliant – e.g. through GAEC and the 8 Farming Rules for Water – and those that can be rewarded through stewardship or Natural Capital schemes. A good example of this are catchment schemes that reward farmers (based on Guidance) for not undertaking practices that are technically illegal.

Conclusion

As this summary shows, there is currently no shortage of soil management guidance, and this in itself is no bad thing. All of the documents in their way contribute to improving understanding of soil, and many are important instruments for engaging farmers who otherwise might not have access to other forms of advice (advisors, peer to peer etc). Some of the authors responsible (NGOs, catchment schemes) will have a greater reach than official mechanisms.

And yet despite all this guidance, farmer awareness of soil health, soil functions and wider issues, such as its impact on climate change (and vice versa), varies dramatically throughout the industry, and evidence of continuing soil decline grows day by day.

Of course, the variation in guidance is not solely responsible for this – it is after all just one tool in the armoury of formal and informal interventions. In particular, this analysis does not address official advice, and specifically the BASIS and FACTS schemes for agricultural advisors, both have strong soils content – required for FACTS and optional for BASIS. BASIS modules include BASIS soil and water management plus the new BASIS Quality of Soils.

Soil guidance is in many ways a proxy for the overall state of soil policy, however – and soil leadership in particular. The fragmented, disjointed, un-strategic and vague picture of soil management is a reflection of the disjointed, un-strategic and overall vague policy framework – and underlying lack of central, authoritative policy leadership and priority placed on soil by successive governments.

It is this lack of leadership that has created a vacuum for agencies, NGO's, catchment schemes and even industry to fill, leading to uncertainty among farmers about where authority lies, no clear consensus on metrics

or indicators, responsibility divested to a variety of different organisations and the lack of a shared approach to avoiding, diagnosing and remedying soil degradation problems.

Recommendations

This analysis points above all to the need for a definitive, Defra-driven guidance about how to assess soil health and how to identify and remedy soil degradation problems. This should build on the best of the existing guidance documents identified above and be created in consultation with the community of soil stakeholders and experts to ensure that it is fully comprehensive.

Above all, such guidance needs to:

- Be up-to-date and authoritative (i.e. government sponsored)
- Consider soil in the round, reflecting all the productivity and ecosystem services it delivers
- Be consistently and proactively communicated to farmers
- Propose consistent targets, metrics (soil quality indicators) or standard operating procedures
- Be universal – can be understood by all farmers but reflect geographical variations
- Be tied into and reflect regulations and enforcement
- Receive adequate investment to achieve widespread take-up

ELM represents the once in a generation opportunity to put soils at the heart of farming policy, and guidance developed in accordance with these principles should be the critical instrument for achieving it.

This guidance should underpin many of the ELM objectives - providing the soil-specific content for the independent advisory services, acting as the basis for payments – both practices and the measurement of outcomes, generate a universal language and understanding of soil and its contribution to public goods and help generate the comparable, consistent data that is needed for both a nationwide picture of soil health and access to private finance.

Over and above ELM though, the development of such guidance would demonstrate a tangible engagement with soil health, a new era of soil appreciation and a commitment to achieve the government's aim, outlined in the 25 Year Plan for the Environment, to achieve sustainably managed soils by 2030.