

Written evidence submitted by Agriculture and Horticulture Development Board (AHDB)

1. AHDB is a statutory levy board, funded by farmers, growers and others in the supply chain. Our purpose is to equip levy payers with independent, evidence-based information and tools to grow, become more competitive and sustainable. We cover the six sectors of Pig meat in England; Beef and Lamb in England; Commercial Horticulture in Great Britain; Milk in Great Britain; Potatoes in Great Britain and Cereals and Oilseeds in the UK.
2. Soil provides many ecosystem services and focus of the AHDB response relates to arable crop and livestock production and horticultural use.

How could soil health best be measured and monitored? How could the Government develop a strategy for tracking soil health?

3. Soils in E&W have been affected by declines in organic matter, with implications for their biological productivity, resilience and mechanical stability during crop and animal production. Soil Health measurement and monitoring requires indicators that will establish sound baseline information and measure change over the medium to long-term. Scale is also important and needs to reflect national, regional (catchment), and farm and field levels. The tools should be readily available and cost effective.
4. A consolidated approach is required; at present there are different requirements for different needs, e.g. relating to soil classification and land use, water framework requirements or catchment management. Consideration needs to be given to the common soil health requirements for meeting these needs and a co-ordinated approach developed for measuring and monitoring. There can be 'read across' of the outcomes and, of interventions measured against agreed criteria. The data from the monitoring exercises, should (subject to appropriate confidentiality and anonymity) be open access and able to be interrogated by the engaged parties.
5. The indicators used may be chemical, physical and biological, and components relating to soil structure could be measured – drainage, water retention, compaction and soil organic matter. Soil biodiversity, using total biomass may be useful, but how the structure and size of the soil microbial, animal and plant community interact to maintain and improve soil health needs to be better understood.
6. Crop and animal performance could be considered as a measure of the productivity of healthy soils but there are many confounding variables, around weather and production economics that make this a challenging metric.
7. These elements come together in two of the recommendations from the report that AHDB contributed on 'Feeding the Future'¹
 - Use systems-based approaches to better understand and manage interactions between soil, water and crop/animal processes

¹ <http://feedingthefuture.info/report-launch/research-priorities/>

- Develop evidence-based approaches to value eco-system service delivery by land users and incorporate these approaches into effective decision support systems at the enterprise or grouped enterprise level
8. From a grower/producer perspective the focus needs to be on practical measures that engender positive change.

What are the benefits that healthy soils can provide to society?

9. A crucial national benefit provided by healthy soils is improved security of production of safe food. A more resilient soil will potentially improve services in relation to water storage, with reduced erosion of particulates and nutrients; improved Integrated Pest Management systems exploiting beneficial micro-organisms with the potential to reduce crop protection product usage; irrigation capability to maintain productivity and avoid soil/crop stress; better nutrient recycling; greater carbon storage to reduce GHG emissions from arable land.

What are the consequences of failing to protect soil health for the environment, public health, food security, and other areas?

10. The opposite of the above, e.g. risks to the food supply chain, with potentially more expensive or environmentally damaging sourcing.
11. Less healthy and resilient soils are at greater risk of compaction in both crop and livestock production systems and this has consequences on efficiency of crop production and animal health.
12. Poor water holding capability in soils could lead to greater flooding and soil erosion risk, a scenario likely to increase with current climate change projections.

What measures are currently in place to ensure that good soil health is promoted? And what further measures should the Government and other organizations consider in order to secure soil health?

13. There are a number of current initiatives that generate and deliver information relating to improvements in soil health. These are badged under a wide range of initiatives e.g. Rural Economy and Land Use (RELU) Landbridge knowledge exchange network², Catchment Sensitive Farming (CSF) initiatives and case studies³, research council funded programmes e.g. NERC Soil Security or Sustainable Arable Research and Innovation Club (SARIC) where outputs are promoted through research conferences and Knowledge Transfer Networks.
14. AHDB recognises that the need to develop and maintain, resilient bio-diverse soils is central in meeting the demand for food and alternative fuels, particularly because of the combined pressures facing agriculture to reduce environmental impact and adapt to climate change⁴. A range of resources are available for example to help levy payers assess soil structure and health,

² <http://www.relu.ac.uk/landbridge/>

³ <http://publications.naturalengland.org.uk/category/13001>

⁴ <http://www.ahdb.org.uk/projects/Soils.aspx>

and manage cultivations, examples include Soil management for potatoes⁵ and Healthy grassland soils guide⁶

15. Although these all generate valuable knowledge and outputs, navigating a way through the plethora of research projects and advisory literature is daunting for growers and advisors. There is a challenge in consolidating the most relevant information for a particular location where individual site specific management decisions need to be taken.
16. Going forward it is crucial to take a holistic view of soils and not to consider soil health in isolation.
 - There is a need to consider water management, in particular relating to catchments; and consequences of climate change.
 - Investment in soils R&D and support for translational activities to improve knowledge by advisors and practitioners.
 - There is a need for co-ordination of outputs and consistency in messaging.
 - The evidence provided by research and an ongoing critical evaluation of outcomes can support the development of frameworks (policy) for improvement of soil health but specific management decisions will need to be taken on an individual field basis (advisory).

What role (if any) should soil health play in the Government's upcoming 25 year plan for the natural environment?

17. Soil health is key in nearly all areas relating to crop and grassland productivity, due to the processes of decomposition of organic matter and nutrient cycling. Plus, soil-borne pathogens can cause yield losses, while beneficial organisms can promote plant growth or suppress disease. Soils health (biology) is interlinked with soil physics and chemistry and all play a role in maintaining productive agricultural and horticultural systems. As a national resource, it is crucial that soils are adequately protected and where possible quality enhanced to improve delivery of a wide range of ecosystem services and, from an agriculture and horticulture perspective, improve resilience in production systems to be better able to cope with economic and environmental challenges.

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⁵http://potatoes.ahdb.org.uk/sites/default/files/publication_upload/Soil%20Management%20for%20Potatoes%20updated%202013.pdf

⁶ <http://dairy.ahdb.org.uk/resources-library/technical-information/grass-management/healthy-grassland-soils-guide/#.VpZ5KcsnzZ4>