

## Soil surveyors' comments concerning the Agriculture Bill 2019-20

*Submission of written evidence by former members of the Soil Survey of England and Wales and Soil Survey and Land Research Centre, since having worked for Cranfield University or other soil consultancies.*

**As soil scientists with many years of experience of British soils, their use and variety, we welcome the proposal to provide financial assistance to the farming community for the implementation of measures to protect and improve soil quality. Soils are the foundation of all terrestrial ecosystems, including those geared to food production. Through the interconnectedness of nature, they perform key ecosystem functions – food and timber production, carbon storage, water storage and release, and the support of above and below ground biodiversity. However, by their very nature they are a hidden world, easily ignored and forgotten. Changes to the quality of farmland soils have had impacts on their ability to support the above functions including, for example, their capacity to absorb large volumes of rainwater before it floods lower catchments. We therefore believe that payments to farmers for the implementation of a range of measures designed to improve soil quality and thus their ability to provide vital ecosystem services, would deliver significant benefits to the nation.**

There is evidence to suggest, amongst other changes, that a gradual loss of soil organic matter (SOM) in UK agricultural topsoils over past decades has rendered them more vulnerable to structural damage (compaction at various depths and sealing of the surface) and has resulted in a decline in the biological diversity and living biomass of soil fauna. The migration from mixed farming systems, which provided on-farm organic additions, has exacerbated the SOM decline. These changes to soil quality have the potential to not only reduce crop yields but also the provision of other ecosystem services as mentioned above. The introduction of measures to encourage farmers to adopt practices that would stop, if not reverse, these declines would therefore be welcome. However:

1. Soils lose organic matter a lot faster and more easily than they gain it. It will be difficult to detect significant SOM gains within the normal time scale of payment schemes.
2. UK soils are extremely variable, not just in terms of their organic SOM content, but also in their origin and soil forming material, depth, texture (sand, silt and clay content), natural structure and drainage status and water holding capacity - all factors that influence their ability to absorb water and lose, retain or gain SOM. Under consistent climate and land management, soils reach a natural SOM equilibrium value, but this varies between soil types.
3. As well as the results of current research, there is a wealth of practical, field-based knowledge regarding the nature and functioning of soils, large parts of which dates back to the post war period when the nation invested heavily in soil research with the objective of increasing national self sufficiency in food production. Much of this is relevant to the protection and improvement of soil quality. However significant amounts of it is in the 'grey literature' - pre-dating digitisation, making it difficult for modern day access.

We therefore recommend that Government engages with the soil science community to exploit its knowledge and skills, to fully understand the nature of the challenge and to identify those practices most likely to lead to successful outcomes. The majority of practising soil scientists are members of the British Society of Soil Science; it has as its aim the improvement and application of soil knowledge and understanding.

Signed:

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