Measuring soil health

Soil Association position paper, March 2018

Soil organic matter (SOM) should be included in Defra's new mandatory soil testing that all farmers will be required to carry out from this April, as part of the 'Farming Rules for Water'. This Q&A sets out practical details of how such testing should work.

1. What should farmers test for?

Soil organic matter (SOM) is the most important thing that all farmers should be required to monitor. This was recognised by the Environmental Audit Committee's 2016 inquiry into soil health, and a letter to The Times from 32 Professors of Soil Science in November 2017.

SOM measurement should be included in the requirements for mandatory soil testing from April 2018 under the 'Farming Rules for Water', which currently only require testing of Phosphorus, Potassium, Magnesium, pH and Nitrogen.

2. Which method should be used?

The overriding principle must be for soil testing to be simple and consistent.

The 'loss on ignition' (LOI) test should be used to measure soil organic matter. Samples should be taken in line with the standard protocol (for example, see this guide from the Farm Carbon Cutting Toolkit).

Whilst there are more complex measurements such as soil density, and sampling to different depths, the LOI test is the most suitable way for farmers to monitor SOM in agricultural soils.

3. How often should soil testing be carried out?

On every farm, soil testing should be carried out at least every 5 years, with 20% of fields tested annually.

4. Should it be compulsory?

Yes. Most farmers know that they should test SOM regularly - and many already do. Therefore, requiring SOM measurement as part of the new compulsory soil testing will be seen as logical. Farmers will use the results of the soil tests to inform their soil management practices so it will benefit their businesses too.

5. What should happen to the data?

Farmers should be required to share the data with Defra to form a national soil health database that can be analysed and updated on an annual basis and used to inform further policy making.

Although LOI tests for SOM will be carried out by different labs, and samples not collected to exact protocols, the collection of samples and the LOI test are simple enough for detailed rules/regulations on sample collection and testing to be unnecessary. The results will give an adequate picture of SOM levels in England, and how they change over time.

6. Who should pay for testing?

The government should pay for soil testing, not least to ensure data is available for analysis and use by Defra and to determine whether policy objectives are being met.

Soil testing for SOM is relatively inexpensive; for instance, NRM LOI tests cost around £10 for a single test, down to £9 per sample for 20 samples.

Collecting the sample is the most costly part of soil monitoring, so once a farmer has a properly taken sample, it is worth maximising the use made of it.

7. Should farmers also receive payments for the levels of SOM they achieve?

No. Starting positions are too varied (history of management maybe over 100s of years, soil type, climate, elevation) and confounding factors (weather, soil type, farming system) too many, for outcome measurements to be the basis of payments.

However, alongside regular testing/monitoring of SOM and reporting of results, government should incentivise management practices that are proven to increase SOM and soil health. Such methods include: winter cover cropping; incorporating grass and legumes like clover in rotation; additions of compost/composted farm yard manure; reduced tillage, planting deeper rooted crops; and organic farming, which combines most of these practices.

8. Should government set a target for improving soil organic matter?

Yes. The UK has already signed up to the 4 per 1000 soil carbon initiative, launched at the Paris Climate Summit. This aims for an annual 0.4% increase in soil organic matter. This is a realistic and achievable target for many agricultural soils – especially degraded arable soils, where much greater improvements are possible – and should be treated as such. Previously, the Soil Association called for a UK commitment to increase SOM by 20% over 20 years – based on what had already been demonstrated as possible on organic farms.

9. How should additional payments for improving soil health be determined?

Some basic soil management practices should be mandatory and/or required for a farmer to be eligible for any payments under the new 'public money for public goods' farm support framework.

For example, for arable farmers to be eligible for new public good payments, a minimum baseline (which would be covered by the new payments) could comprise of: two years of clover/legume leys in the rotation; 5% of the farm in wild bird feed/nectar rich options; a requirement to keep arable land with cover for 9 months of the year; testing SOM and reporting the results.

Further payments could be made if farmers adopt practices that deliver significant additional benefits to soil health, such as composting farmyard manure for at least 6 months before spreading, use of green winter cover crops, increasing the proportion of deep-rooting plants and plant diversity in permanent leys, and organic farming.

Further information:

The Soil Association is organising an on-farm workshop to further develop proposals on soil monitoring and soil policy. Contact policymail@soilassociation.org for details.

GREATsoils (Growing Resilient Efficient and Thriving soils) is an AHDB-funded joint project offering free on-farm workshops on improving soil health for growers, advice on soil testing, and knowledge exchange. See: www.soilassociation.org/greatsoils.

Download the Soil Association's latest soil policy briefing at: http://bit.ly/2p8TjhQ.