How healthy are your farm soils?

Soil is the bedrock of a farm's success, influencing everything from crop production to animal health. But there's more to understanding soil health than a simple nutrient analysis; and doing so carries significant benefits, as British Dairying reports.

In recent years, UK agriculture has often overlooked the crucial link between soil health and livestock wellbeing. Yet healthy soils, paired with effective forage and crop management, are essential for thriving livestock production.

By investing in soil health, producers can boost disease resistance, productivity, and ultimately, profitability.

"Soil is your farm's most valuable resource," says Sarah Bolt, Technical Knowledge Exchange Manager at Kingshay. "Without it, farming is neither profitable nor sustainable."

Soil health relies on a complex balance between biological, chemical and physical factors, and interactions between all three. A healthy soil typically contains: 40% minerals, 10% organic matter, 25% water, and 25% air-filled pore space.

Well-fed worms will be a deep red/brown colour and very active

How to assess soil health

To get a clear picture of soil health, producers need to evaluate all three areas of soil health.

1. Soil chemistry (nutrient availability): Send soil samples to a laboratory for analysis. This can be a basic analysis for potash, phosphate, magnesium and pH or something more in-depth to include micronutrients and cation exchange capacity.

2. Soil physics (soil structure): One of the most useful tools is the Visual Evaluation of Soil Structure (VESS) to assess your soil's physical condition. This provides a soil quality score, helping to pinpoint areas that need improvement.

3. Soil biology (soil organisms): A handful of soil should contain billions of soil organisms, from micro-organisms to large organisms, visible to the human eye, like earthworms, insects, larvae, slugs and millipedes.

With all soil organisms being inter-dependent, monitoring one of the macro-species will give a good indication of the health of the rest of the food chain. Earthworms are the most easily identified, and numbers in the soil will give a good indication of overall soil health.

Other considerations:

- Soil should be warm to touch – this indicates that air is penetrating, allowing plant growth to start earlier in the spring and extend later into the autumn.
- Roots should be well dispersed through the soil profile. This indicates good soil structure, allowing roots to freely go down to extract moisture and nutrients.
- Clover roots should have large pinkish white nodules, to show they're fixing nitrogen efficiently.
- Soil should have a pleasant earthy smell, indicating that the microbial system is working well.
- There should be no plant material (like stubble) left from previous years. If material is left it indicates the soil is not cycling efficiently.
- Soil should not be waterlogged or dehydrated. Too much moisture and the soil becomes anaerobic, too little and there is not enough moisture for nutrient transfer.
- The number, size and colour of soil mottles shows how aerated the soil is. As oxygen depletes, orange, and ultimately grey mottles form. A lot of mottles indicates that the soil is waterlogged for much of the year.

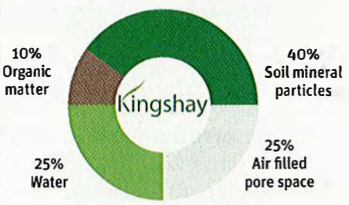
How to carry out an earthworm count

- Dig a hole to around 30cm depth (as this is the main zone of biological activity).
- In moderate weather (not too hot/cold, wet or dry) there should be around 25 worms per spadeful of soil, with a range of sizes from a few mm to finger-size.
- Well-fed worms will be a deep red/brown colour and are very active when placed on your hand.

Assessing soil health is a crucial step in meeting the Sustainable Farming Incentive (SFI), requirements. But even for those not in SFI, planting multi-species swards will enhance soil health.

"Many species sown in diverse swards are deeper rooting than grass, leading to improvements in soil structure," says Sarah. "This in turn improves the soil's water holding capacity, and increases flood resistance by reducing run-off."

Diverse species capture more carbon from the atmosphere and transfer it via rhizodeposition to the soil. This increases carbon and soil organic matter (SOM) and positively impacts soil structure, particularly its ability to hold moisture. Increased SOM will also improve soil biota, improving nutrient cycling.



"Providing a wider range of flowering plants will deliver an enhanced habitat and food source for invertebrates, thus supporting the wider food web," she adds. "An increase in pollinators will also be beneficial for crop production."

Multi-species swards also help with natural parasite control and weed management, and can deliver higher yields, reduced reliance on artificial fertilisers, better drought tolerance, and enhanced forage quality. "By investing in diverse swards, you're not just improving your soil; you're laying the foundation for a more sustainable and profitable farm."

Visit Kingshay at the Dairy Show

Come see a demonstration of healthy soil at the Kingshay stand at the Dairy Show. The wormery display will show soil beneath a mixed-species sward with grasses, herbs and legumes. And advisers will be on hand to discuss how to maximise your soil's potential.