Improving soil health has been identified as a crucial step in ensuring the long-term sustainability of crop production, while also positively impacting immediate profitability for farmers. **Arable Farming** reports.

Adding carbon to rebuild soil health

The use of liquid carbon-based soil improvement products at establishment is one tool which could help growers meet the challenge of rebuilding soil health.

Alistair Hugill, commercial manager at ED&F Man Agronomy, says reduced soil carbon and lower levels of organic matter compromise crop yields.

He says: "It is therefore important to reverse this trend, to rebuild soil organic matter and promote more efficient nutrient uptake for more profitable and sustainable production."

In a planned approach to improving soil health and crop sustainability, he adds the starting point is to boost soil microbial activity.

Soil microbes capture and solubilise nutrients for the plant, so the more effective the microbial populations, the better the nutrient supply to the plant.

He says: "Increasing the supply of readily available energy and carbon to the soil microbiome is an effective way to stimulate soil biology, increasing the activity of fungi and protozoa as well as bacteria.

"Additionally, increasing the supply of carbon will help to improve the soil's physical and chemical properties."

Alistair Hugill

In a symbiotic relationship, plants provide carbohydrates and carbon to the soil in the form of root exudates – effectively a sugar/carbon solution for the microbes.

Mineral nutrients

The larger microbial population that results increases the rate at which mineral nutrients in the soil are dissolved, increasing their availability to the plant.

Mr Hugill says: "Plants produce carbohydrates via photosynthesis and any surplus is excreted as root exudates to feed the soil microbiota.

"When performing well, a plant will provide 40% of the products from photosynthesis into the soil, containing carbon and sugars.

"If we feed the plant with a direct source of sugar and carbon, it can meet its demand for carbohydrates for growth more efficiently, allowing the production of root exudates to increase, supporting a healthier soil microbial population and in turn increasing nutrient supply to the plant."

The liquid carbon products are formulated for soil and foliar application. Filtered to 200 microns, they are suitable for use in most spraying systems typically at around one to two litres per hectare, depending on the crop.

Mr Hugill advises using both soil and foliar applications.

He says the immediate benefit of soil applications is that they drive root development, which can be advantageous throughout the season.

He adds: "By feeding the microbiome around the seed, we provide a feed and carbon source to increase soil bacteria, which in turn

Improved soil health and organic matter help boost crop growth and resilience.


Liquid carbon-based soil improvement products can help crop establishment by feeding the soil biome.

encourages stronger rooting and better crop establishment.

"The increased carbon supply also helps maintain and build carbon levels in the soil.

"Strong rooting can help the plant throughout the season.

"Deep rooting gives better access to water and nutrients, and crops are better able to withstand drought and frost.

"We are seeing evidence of better drought resistance and faster recovery after a period of drought."

Applications

During the season, foliar applications will continue to supply carbon to the soil while increasing the supply of root exudates.

This will maintain a higher rate of bacterial activity and a greater supply of nutrients back to the plant.

Mr Hugill says: "The increased release of soil minerals is allowing growers to reduce reliance on artificial fertilisers, increasing nitrogen use efficiency and reducing input costs.

"Over time, as soil carbon increases, the workability of soils improves, allowing a reduction in cultivation costs and increasing the timeliness of cultivations.

"As growers strive to improve soil health, it will be important to recognise the need to make changes to their system.

"Fuelling the relationship between plants and the soil microbiome is one change that is beginning to deliver benefits, both short and longer term," he adds.

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>
> *ALISTAIR HUGILL*


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