

Meeting the **SOIL REGEN** challenge head-on

One Nottinghamshire farmer is determined to challenge farming practices before he is forced to change with the focus on improving soils.

"Farmers have always farmed the way the government wants them for farm," comments Ed Hammond who farms 800ha near Southwell, growing cereals, potatoes, sugar beet and maize for AD on a mix of soils including Trent gravel, salt clay, sand loam and sandy silt loam.

"The consequence is that the drive has been for more intensive, higher yielding systems which have damaged soils. The focus now needs to be much more about improving soils which are a finite resource. We need to achieve the same return from lower levels of chemical inputs and regenerate soil."

As a result, since 2017 Ed has been working on evolving his system with the goal of achieving the same margin from growing less.

His system is now based on min till for all crops except potatoes, although a small amount of land is also ploughed for maize as it is a lazy rooter and needs looser soil. He shares a 5m cross slot drill with a near neighbour to ensure effective crop establishment. Extensive use is made of cover crops.

Soil biology

Ed is also playing close attention to soil biology. "We need to rebuild the soil biota and carbon as these are fundamental to soil health. Soil is much more than just a growing medium. It can contribute significantly to the crop. If we have healthier soil we can increase efficiency of nitrogen use and reduce usage of artificial fertilisers."

Since 2020 Ed has been using a range of liquid carbon nutrition products based on sustainable molasses and plant-based nutrients as an effective tool for effective soil regeneration. The ED&F Man Agronomy range contains four liquid carbon products formulated for specific situations and requirements, allowing a tailored programme to be developed to optimise crop establishment. All products are high in carbon and sugars from sustainable sources complemented with a range of other ingredients.

"Sustainable cane molasses is a natural source of both carbon and energy," explains Alistair Hugill from ED&F Man Agronomy. "The high carbohydrate content stimulates microbial populations in the organic layer and drives microbial activity through to the topsoil, stimulating greater nutrient uptake

even down to the sub-soil layer.

"In a planned approach to improving soil health and crop sustainability, the starting point is to boost soil microbial activity. Soil microbes capture nutrients for the plant so the more effective the microbial populations, the better the nutrient supply to the plant."

Increasing nutrient supply

All plants provide carbohydrates to the soil in the form of root exudates, effectively a sugar solution for the microbes. The carbohydrates feed the microbes and increase the rate at which mineral nutrients in the soil are dissolved, increasing their availability to the plant.

"Plants produce carbohydrates via photosynthesis and any surplus is used for root exudates. When performing well a plant will provide 40% of assimilates from photosynthesis into the soil via root exudates, containing carbon and sugars. If we feed the plant with a source of sugar and carbon, it can meet its demand for carbohydrates for growth more efficiently and allowing the production of root exudates to increase, in turn increasing nutrient supply to the plant."

Reducing nitrogen use

All nitrogen is applied as liquid, so the liquid carbon is simply added to the mix, whether applied as a soil or foliar feed.

"We have found it helps to work as a

wetting agent and reduce scorch, while the amino acids are rapidly utilised by the plant. Since using the supplement, we have been able to reduce nitrogen use.

"On spring barley we have cut back from 120kg/ha to 80kg/ha with no change in yields. Usage of potatoes has been reduced from 270kg/ha to 180kg/ha.

"The improved soil structure has helped crops deal with drought, generally being able to withstand dry conditions for longer. We have also seen an increase in the number of possible drilling days which is a real plus as we are sharing the drill and having to get a bigger overall hectareage into the ground.

"The drill uses pressure to get into the ground and our drill operator has commented that less pressure is needed as the soils work easier, increasing the speed of operations, increasing the number of drilling days and reducing establishment costs.

"We are taking a holistic approach to soils combining minimal disturbance, cover crops and liquid carbon supplements and it is having a big impact. If we can build soil organic matter and promote more efficient nutrient uptake by plants we can improve soil health for more sustainable production," Ed suggests. **FG**

