

A spoonful of sugar

“It’s important to reverse trends and start to rebuild soil organic matter.”

Applied innovation

With soil organic matter levels reaching an all time low in some areas, utilising the benefits of molasses could help growers to start to rebuild these vital stocks. CPM finds out more.

By Charlotte Cunningham

It’s often said that a farmer’s greatest asset is the soil beneath their feet. However, after generations of intensive cultivations, tight rotations and the use of synthetic inputs, many soils across the country have experienced a major degradation of soil organic matter.

This is something that independent agronomist, Gary White, has noticed during recent years. Covering the East of England, Gary advises over 9,000ha of crops including cereals, sugar beet, potatoes and vegetable crops through his business G & A Crop Nutrition. “According to my research, the county I operate in —Lincolnshire – has lost about 5% organic matter over the past 80 years, which is quite a big drop. It’s evident now in soils how poor water infiltration and the structure is, because of the loss of the organic matter and as such, the carbon as organic matter is 58% carbon.”

The challenge with this is that reduced soil organic matter levels often correlate with less yield, explains Alistair Hugill, com-

mercial manager at ED&F Man. “Therefore, it’s important to reverse this trend and start to rebuild soil organic matter to promote more efficient nutrient uptake for more profitable and sustainable production.”

Energy boost

An effective way to achieve this is by increasing the supply of energy and carbon to the soil microbiome, which in turn boosts activity and stimulates nutrient uptake. “The idea of this is that the additional supply of carbon will help to improve the soil’s physical, chemical, and biological properties.”

To do this, Gary says growers are considering a number of strategies. “Many people are looking at cover crops and using them but they don’t always fit in with rotations or management. It’s this that led me to look at other options, including the use of molasses.”

The use of sustainably sourced molasses, and the benefit they could have on soil organic matter levels and subsequent crop yields, is something that ED&F Man has been looking into over a number of years.

“We’ve spent a lot of time researching soil organic matter and what quickly became very apparent is that a lot of sugarcane growers, a century or more ago, were given an allowance of molasses back from the refineries they sold it to in order to use on the land,” explains Alistair. “These would have been fairly difficult times, so we realised there was clearly something in it, and so we launched a project to look into exactly how and where molasses could be beneficial.”

So how exactly do molasses work?

“Molasses are a natural source of carbon and energy. When the high carbohydrate content is supplied in a molasses-based liquid nutrient package it can stimulate microbial populations in the organic layer and drive microbial activity through to the topsoil, stimulating greater nutrient uptake,” explains Alistair. “This improves crop establishment and helps to stabilise soil nutrients, supporting crop growth.”

“In addition, the subsoil layer typically has lower microbial activity levels, however, a molasses-based liquid nutrient can provide a substrate for the aerobic microbial populations which can help to improve the living soil biome.”

Delving deeper into the ED&F Man portfolio, the product range incorporates four key molasses-based solutions: Black Label, Gold Label, Blue Label and Red Label.

To test the full extent of their benefits, the firm has carried out a number of trials with its own researchers and with independent agronomists on-farm to test them in a ‘real life’ scenario.

“Black Label was our first product and has high carbon and free sugar content which makes it particularly effective for pairing with foliar nitrogen applications,” explains Alistair. “This helps to mitigate against both sun and frost scorch and improve the metabolism of nitrates, which increases the efficiency of fertiliser absorption.”

Black Label was also the first of the ED&F Man products to be trialled as part of the project, with researchers starting by specifically looking at scorch mitigation, recalls Alistair. “It was incorporated into a late nitrogen application in wheat and had a



The county of Lincolnshire has lost about 5% organic matter over the past 80 years, notes Gary White.



A substantial increase in the size and length of wheat ears – resulting in a 1.5t/ha yield increase – were observed in trials using molasses.

very strong effect. With just one application, yield was improved by 0.5t/ha.”

Trial work has also shown improvements to growth quality where Black Label has been used, notes Alistair. “A few years ago we carried out some trials based around carrot growth in Kings Lynn, comparing untreated crops with those which had been treated with 6.6 l/ha of Black Label in 300 l/ha of water every 14 days, over a total of six applications.

“What we found was a decent overall yield increase in the molasses-treated carrots — 3.2% — but also far more consistency within their growth.”

The same effect was also observed in a trial on apples at an orchard in Kent. “Again, far more consistent growth was observed, so what I think we’re seeing where molasses are used is a general alleviation of stress which allows crops to behave in their most natural form and suffer from fewer challenges.”

Moving on to Gold Label, this product includes a blend of cane molasses and fermented co-products from the sugar industry. “This gives the blend naturally high levels of carbon and amino acids, beneficial to soil health and aiding germination and early establishment.

“The plant-based micronutrients supplied in this biological complex help to facilitate the restructuring of inorganic nitrogen into amino acid building blocks for protein synthesis.”

Specifically for foliar application, Blue Label is a blend of cane molasses, sugar co-products, and a concentrated *Ascophyllum nodosum* seaweed extract, explains Alistair. “The addition of seaweed provides a large boost of nutrients to the blend as it is particularly high in amino acids, enzymes, polysaccharides, fatty acids, lorganic glutamine, and bioactive peptides.”

Trials have found that Blue Label helps to enhance the plant’s own biochemistry boosting efficiency and growth mechanisms in the developing crop, he continues. “The

sugars from the cane molasses promotes a more vigorous carbohydrate development in the plant aiding in a healthier, stronger cell structure which is less prone to biological and chemical stresses and disease.”

Gary has been part of the trials network and says he’s seen promising results on his farms. “We’ve done a range of trials on various crops, from winter wheat and barley to sugar beet and potatoes, so we have quite a wide experience and this year we’ve started to use molasses on vegetable crops too.”

Among the results, one of the headline findings on a crop of winter wheat was that when amino acids and molasses were added to the programme via Gold Label, a substantial increase in the size and length of the ears was noted. “At the end of the trial, this translated into a 1.5t/ha yield increase — compared with the untreated plot,” explains Gary.

Tramline trials

Other studies have included tramline trials on clients’ farms to see what visual differences occurred where molasses were used, he continues. “We also carried out SAP and N-testing to further explore the benefits and have found better nitrogen efficiency in the treated plots, as well as better nitrogen levels within the crop itself.

“I use a small bit of kit called a microbiometer which allows me to quickly test microbial biomass and fungal-to-bacterial levels in soils in order to determine soil health. It also gives you a reading of carbon at the same time, and based on these measurements, we’re definitely seeing an improvement where we’re using molasses.”

Alistair adds: “There’s a principle that if you push bacteria within soils really hard it tends to be at the detriment of fungi, but in a healthy soil you’re very much looking to have both. However, with our products we’ve very much found that tends not to be the case.”

The product also contains citric, lactic and malic acids, which adds to its value, notes Gary. “They are very good at helping solubilise P within the soil, so that’s another benefit – it’s more than just the cane.”

As well as benefits to crop health and performance, longer term observations have shown improvements to soil health, structure and drainage, he adds. “Something else we’ve seen which is quite interesting is that thanks to the humectant properties within the molasses, it can help to calm a particularly complex tank mix, in a similar way to an adjuvant,” points out Gary. “With mixes often now consisting of several products due to tight weather windows at spraying times, this



An effective way to restore soil organic matter levels is by increasing the supply of energy and carbon to the soil microbiome, which in turn boosts their activity and stimulates nutrient uptake, explains Alistair Huggill.

is really useful.”

Adding to this, all products are filtered to 200 microns, making them suitable for use through the majority of UK spraying systems, which Gary says adds to the practicality and usability of these molasses-based nutrients.

Alistair concludes: “I think the use of molasses has been one of those things people have tried in the past and had some disasters with. But this range marks a step change in how these products are designed and incorporated.

“I recently had someone tell me molasses used to be like stirring old engine oil into your sprayer, whereas now it’s like pouring in orange squash.

“In an ideal world, all farms would have livestock or cover crops to ensure they’d have all the soil organic matter they’d ever require. But we know in reality that’s not always practical, so harnessing the power of molasses ensures all farmers have the opportunity to start to rebuild those vital soil supplies. It’s proven, it works and it’s reliable.” ■

Sponsors box

CPM would like to thank ED&F Man for kindly sponsoring this article and for providing privileged access to staff and material used to help put the article together.

