

Protecting beds for beet



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STEPHEN ALDIS

Fast establishment and quick, early growth are critical to maximise sugar beet yields, however the process to produce a perfect seedbed should start in the autumn. *CPM* digs deep to assess best practice.

By Mike Saull

While the principles for securing a good sugar beet crop are well recognised, the many routes to get there can be increasingly varied. And while the aim is often to secure peak yields, the future performance of other crops shouldn’t be neglected through compromising soil health along the way.

Established beet growers will understand that if weather and soil conditions are favourable the crop should be drilled in early March; every week delayed past mid-April can cut yields by four adjusted t/ha. But, while growers may have the kit and capabilities to cover ground quickly and effectively, how should they go

about it without knocking the soil back and incurring unnecessary costs?

PATIENCE AND PLANNING

According to BBRO, regardless of establishment method, advice is to pay close attention to soil condition and adapt management to maximise performance. It’s a process that requires patience, planning and careful management tailored for every field, says Georgina Barratt, BBRO head of crop production.

“Soil conditioning should start in the autumn as soon as the previous crop has been harvested. Research confirms a range of benefits from using cover crops – particularly on lighter land – to improve soil structure, reduce erosion, and hold



Timing is key

Aim for complete destruction of cover crops at least six weeks before drilling, advises BBRO’s Georgina Barratt.



Strong foundations

Tillage should set a good foundation for the crop to avoid battling against a poor start, urges BBRO's Stephen Aldis.

nutrients overwinter," she continues.

"Surveys suggest around 60% of all beet producers now employ cover crops and that these are delivering soil health improvements as well as nutritional benefits to a crop that requires most of its nitrogen early."

However, this involves picking mixes that'll establish well – considering soil type and condition, and drill date and method. "Mixes comprising two or three species will often give the best balance of delivering a range of soil health benefits while not costing too much. Get them drilled in August or September; the earlier the better to utilise the warm growing period.

"Early destruction – typically in late winter or early spring – is crucial to prevent the cover crop from drawing vital moisture and nutrients out of the soil that could be of value to the beet seed once drilled.

"But be aware that they can also provide a green bridge for aphids and

virus yellows in the following beet crop, so aim for complete destruction at least six weeks before drilling. In this respect, don't worry about applying glyphosate in the cooler conditions at this time of year as it soon takes hold when conditions warm up, and be sure to keep to recommended rates," she explains.

Of all the different cover crop species options that are available, she believes clover is one of the most difficult to kill. Her advice is to consider using Kyleo (2-4-D+ glyphosate) and once this has been given time to work, using mechanical destruction if green matter is still apparent.

"I've seen people pull clover out and leave it on the surface only for it to drop roots and sprout again," she highlights. "The same herbicide choice should be used on big and bulky cover crops."

MAINTAIN RATES

Trial results suggest a residual nutritional benefit from a cover crop,

Getting more from every kilo of nitrogen

Although understanding soil health is the first step, making the most of that knowledge ultimately comes down to nutrient management

While there's a tendency to think of nutrient benefits on a per-nutrient basis, achieving the greatest return relies on understanding how they work together. According to Toby Ward, nutrition agronomist at Origin Soil Nutrition, nitrogen and potassium provide a good example of why nutrient interactions shouldn't be overlooked.

"Nitrogen remains the main driver for yield, but its availability to the crop relies on adequate quantities of other nutrients," he explains. "There's a direct cellular relationship between nitrogen and potassium that has to be maintained."

Where soil potassium levels are inadequate, the crop's ability to take up and utilise nitrogen is compromised, meaning a proportion of applied nitrogen is effectively wasted.

"Good long-term soil potassium levels allow new applications of nitrogen to move throughout the rooting zone," says Toby. "If potassium is deficient, the crop simply can't make the most

of the nitrogen that's been applied."

Following another dry growing season, many growers are expected to bale straw, increasing the amount of potassium removed from fields. Toby says that makes post-harvest soil testing particularly important, rather than assuming nutrient reserves remain adequate.

"Testing soils after harvest will highlight any deficiencies," he says. "Where potassium levels are insufficient, growers could consider reducing nitrogen applications slightly to create headroom for potassium, which is currently less exposed to market volatility while delivering wider agronomic benefits."

The interaction extends beyond nutrient uptake alone. Potassium plays a central role in regulating photosynthesis, water movement and the transport of sugars through the plant, while nitrogen drives cell division and expansion, increasing the crop's demand for water.

"The crop's response to potassium



Good long-term soil potassium levels allow new applications of nitrogen to move throughout the rooting zone, says Origin Soil Nutrition's Toby Ward.

isn't always as obvious as it is with nitrogen," adds Toby. "But maintaining adequate soil potassium improves drought resilience because it allows the crop to use water more efficiently and withstand periods of stress for longer."

The point is reinforced by the Potash Development Association, which reports that the shoots of a well-fertilised cereal crop can contain between 10-15t/ha more water than a crop where nitrogen is limiting, highlighting the importance of maintaining potassium levels alongside nitrogen to maximise both nutrient use efficiency and crop resilience.

but this varies greatly. As a result, Georgina recommends maintaining normal sugar beet nitrogen rates for the first N application after the cover crop. “Early nitrogen is important to boost canopy production and the first application – typically just ahead of the final cultivation – should apply the largest amount of the nutrient without compromise,” she maintains.

“Soil analyses – from samples taken before the first nitrogen was applied – can give an indication of residual nitrogen allowing growers to potentially adjust rates, but often these arrive too late to influence decisions particularly for the first application.”

BBRO’s Stephen Aldis adds that while sugar beet gives an ideal opportunity to carry out remedial cultivations ahead of drilling, only do so when required, and then only carry out what’s necessary. He says it’s also important to check with a spade to ensure the desired results are being achieved, and adjust loosening operations if not.

“Subsoiling or cultivating prior to the cover crop can take out any pans or general compaction with the bonus that the following cover crop roots will help to stabilise the soil. This way you can boost good drainage and structure for a crop that can root deeply and vigorously.”

He stresses that understanding how to destroy cover crops and manage residues is an important step before going down this road, and there’s no doubt that the process is easier on lighter soils allowing for more varied, multiple tillage approaches in the spring.

SELECTING THE DEPTH

Furthermore, ploughing is a common primary cultivation method on light land to bury residues, but it’s important to ensure this doesn’t compromise the seedbed, he says. “Adjust plough depth to suit the situation and go as shallow as possible to achieve the desired result. There’s no point in compromising soil that’s in a good stable condition at greater depths or moving soil unnecessarily,” comments Stephen.

“Spring ploughing isn’t an option for everyone though, given the risk of smearing and compaction on heavier soils which can then dry out quickly leaving growers struggling to work a seedbed that retains enough moisture to drill into.

“Where growers do want to invert heavier soils, most will typically plough and possibly press early,



All-in-one

Secondary cultivations should ideally achieve the desired seedbed from just one pass.

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- and let the weather do some of the work over the winter.”

He notes that UK winters aren't always cold enough to produce a decent frost tilth. “Tillage should set a good foundation for the crop and you don't want to battle against a poor start. In this respect, get the drill operator to sit with your harvest operator in the autumn to find out exactly how they'd like the crop laid out for ease of lifting.

“While growers and operators are always conscious of achieving a good seedbed with regard to aggregate size and soil moisture retention, it's also important to achieve a level finish to aid the harvesting process.

“Although the size of harvesters and their 3m lifting unit may appear to provide a very stable platform, a level field is still required to ensure maximum recovery of beet for the factory and efficient running of the harvester. Recognising these aims creates a focus at cultivation time, and more precise drilling is important to ease the harvest process.”

MOISTURE PRESERVATION

According to Stephen, the key to spring establishment is moisture conservation, meaning only doing what's necessary, as late as possible, and just ahead of the drill. “Conserving seedbed moisture is becoming a constant battle in increasingly dry springs,” he adds.

“The problem is that once moisture has gone, you simply can't get it back, so less can be more when it comes to cultivations. 2026 has proven once again that we can't rely on rain in March and April for the moisture we require to germinate seed drilled into dry seedbeds.”

As such, Stephen's view is that growers should be more strategic in the way seedbeds are created. Secondary cultivations in the spring should ideally achieve the desired seedbed from just one pass, helping to retain moisture and limiting compaction from additional wheelings, he says.

“Combination harrows are always popular on farm, and the key is to tailor the type to the situation. If you always require two operations with what you have in the shed, maybe it's time to look at an alternative that can provide the seedbed in one pass?

“Discs are useful, particularly when



Setting up for the future

According to BBRO's Stephen Aldis, more precise drilling is important to ease the harvest process.

copied with cover crops or high levels of crop residues from the previous crop, but take care not to smear soils in wetter conditions and ensure they move the whole width of the soil profile while leaving a level finish for harvesting.”

He adds that power harrows may be required when conditions aren't optimum, most notably in a challenging spring. “While they're often seen as a cultivation of last resort, one pass with a power harrow may be better than four with another cultivator.

“An increasing number of growers are now using strip or minimum tillage to establish their beet crops, but they have to be aware that these

systems can require a lot of learning and adaption on farm, so starting with a small area would be a wise choice.”

Equally, it's important to consider the whole approach

from start to finish as changes in machinery and practices may be required to effectively implement any change in system. The most obvious of these could be a replacement drill, with much more choice now available on the market, he says.

“Many of the drills now being used for beet were originally designed for the maize crop and feature a larger number of potential adjustments. While this can be very beneficial in reduced tillage systems, it does open the door for error.

“For example, larger drills can place seed deeper than is required for the

beet crop and excessive ‘down force’ can result in sidewall compaction, with the force transferred through the side depth wheels rather than the discs or coulters, potentially creating a zone of compaction around the seed. That's exactly where we don't want it,” he warns.

There's no doubt that moisture conservation has been a recurring theme during the past six years, adds Stephen. “How you deal with it has to be tailored accordingly, particularly with regard to drilling depth; have a plan and look at each operation on an individual field level based on thorough soil assessment.

“Ideally, drill depth should be around 2.5-3cm, but if moisture isn't available, then consider going that little bit deeper up to 5cm depth.

“The ultimate aim is to establish a uniform population of 100,000 established plants/ha across every single part of the field, and to get these to meet in the rows as quickly as possible – parochially by the time of whatever county show is on your doorstep.

“Once the crop is established, do your own plant counts from different areas to check which approach has given the best populations. Counts carried out in rows, in the wheelings and on the headlands, are just as important as those in the better structured areas. These will confirm whether what you've done has worked effectively, and help to identify potential areas for improvement for the future beet crop,” concludes Stephen. ●

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