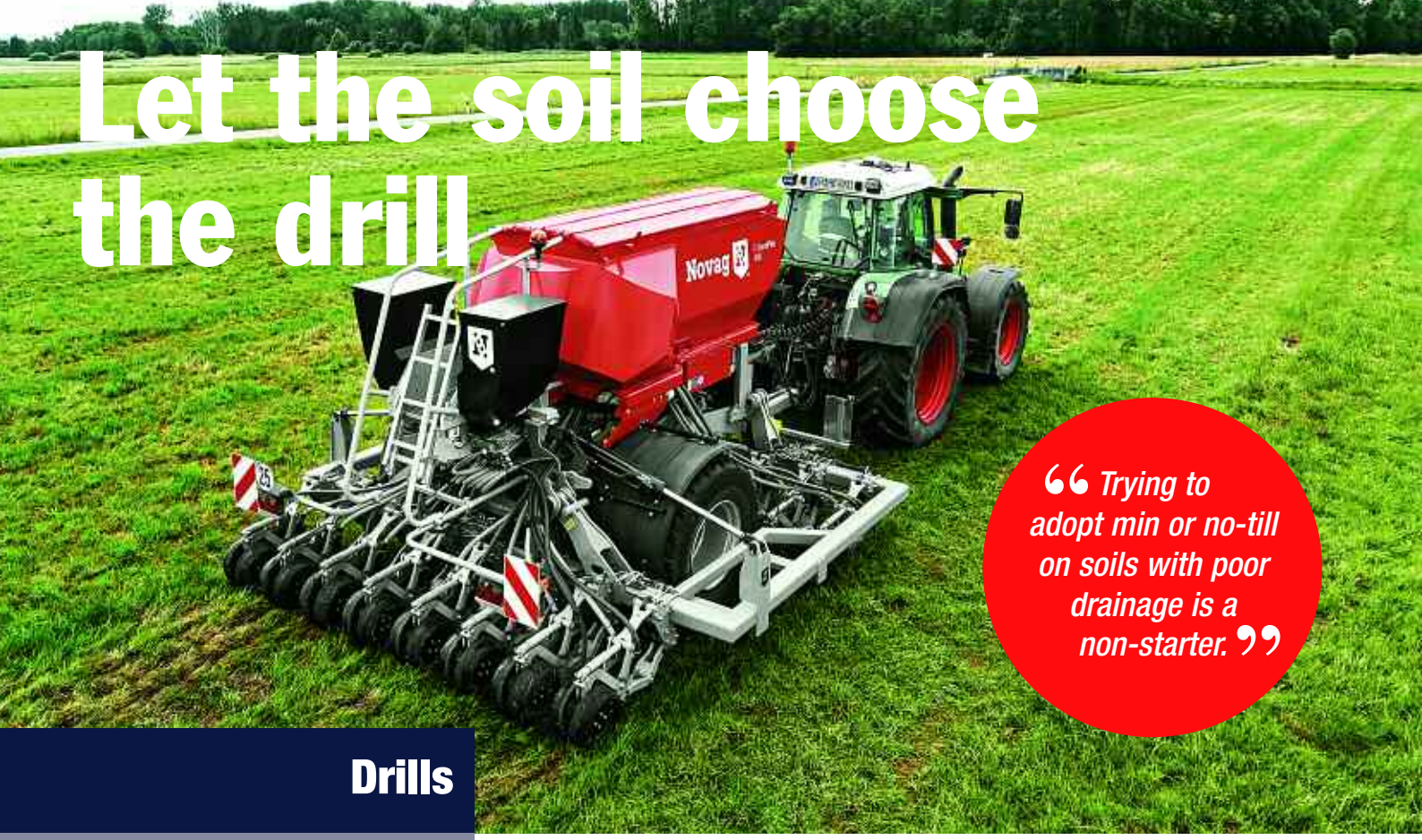
Let the soil choose the drill



> *Trying to adopt min or no-till on soils with poor drainage is a non-starter.*

Drills

Drill for the day, drill for the soil and you'll be away. *CPM* explores the financial and agronomic considerations for low and no-till systems, and looks at some of the latest machinery options available to growers.

By Melanie Jenkins

Establishment is arguably the most vital aspect of a crop's life cycle, but it may also be one of few areas where farmers could make savings to help shore up their businesses for a financially viable future.

But any change of practice is a process and adjusting a farming system is about far more than just buying a different drill, according to AHDB's Harry Henderson.

A trend Harry has noticed in AHDB benchmarking meetings over the winter, is that many growers are just beginning to understand that they're likely to see a reduction in Government payments of at least 50-60%. "There's a double realisation that the money earnt from ELMs will require you to do something that will cost you money in the first place, so it's not so lucrative," he says.

"There's a necessity to save money if farms are to stay in business," stresses Harry. "So farming businesses have to be rethought, substantially.

"From AHDB benchmarking activities, establishment has been identified as the biggest cost. Crop care, harvesting and drying can't be adjusted much — but big changes could be made to establishment," he says.

"All farmers should be thinking about how they can achieve a one pass establishment method on their farms for all combinable crops."

Ten steps to no-till

However, it's not a case of instantly switching, it's considering how this can be achieved and what will happen on farm, he says. "Is your drainage in good shape, is compaction under control, what is your system for removing and selling straw? We know straw is useful for cash flow, but if it's removed, does this lead you down the controlled traffic route?"

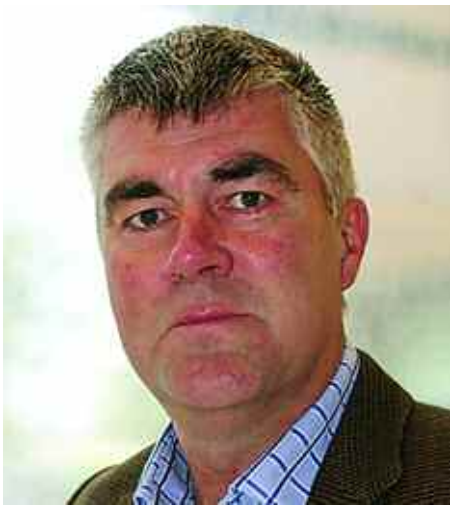
Harry suggests growers wishing to change their tillage practices to min or no-till follow the ten steps to no-tillage adoption. The first step is to expand on and improve knowledge of no-till and of the farm to see how it could be adopted, he explains.

"Getting your family and staff on board is an important part — if anyone believes it will fail, it will because they haven't bought into the concept."

He also advises to start looking at nutrient cycling. "In the face of current fertiliser prices — which aren't going down anytime soon — it's worth knowing where you stand and researching your options."

In addition to this, moving away from a system where soils are tilled is going to lock up more nitrogen. "By tilling soils, you release N, which allows crops to get a quick getaway during establishment," says Harry. "But much less N is released in no-till systems, so there could be a requirement to apply fertiliser with the seed to get crops away."

Chopped straw can also lock up nutrients as it breaks down, he adds. "An excess of decaying crop residue can



The first step towards min till is to learn more about it, explains Harry Henderson.

also cause acidity in the seed zone, so pH is worth monitoring and ground may need liming."

Avoid soils with poor drainage and look to see if something can be done about it, he says. "Trying to adopt min or no-till on soils with poor drainage is a non-starter."

He feels that drainage is such a vitally important aspect of min and no-till practices that Defra funding should be directed towards improving it rather than subsidising drill purchases.

Avoid compaction

The soil surface should be levelled out by getting rid of ruts and then soil compaction can be eliminated, he says. "Going out with a spade is the best way to identify where soil is compacted, but it's likely tacit knowledge on the farm will already be able to identify the vulnerable spots."

The trend for later drilling to control blackgrass should also be reconsidered. Although this can be beneficial for control of the weed, its implications to soil compaction can be serious, says Harry. "If seeds are drilled into smeared soil, this can effect establishment and limit crop growth."

He suggests looking at ways to avoid soil compaction in fields as much as possible, which could be by using a lighter tractor and using VF tyres at the right pressure, as well as using the correct ballasting. "It's about understanding just how quickly soil becomes fragile in the autumn from a no-till perspective."

Something which has caught Harry's attention is central tyre inflation systems. "Tyre technology has come on in leaps and bounds in the past ten years and though it's not cheap, a central tyre inflation system could be worth looking at on your drill tractor, sprayer or even on grain trailers. Combines should be fitted with cyclic operation tyres for the on-off load effect of harvesting."

Using mulch cover is the next step, but Harry warns that a lot of research is still needed on this and how it fits into different farm situations, especially if it's creating green bridges, harbouring diseases or slugs.

Once all of this has been addressed, it's time to look a buying a new drill. "By this point you will know what drill will suit your system and your soil type should choose the drill," says Harry. "Certain drills could put a seed into asphalt if you wanted it to,

AHDB has identified establishment as an area savings could be made.

but it has to work for your soil type.

"There are those who believe a no-till drill will work in all soil types, and that might be true, but it won't work in all conditions. While the seed might be drilled, if poor seed to soil contact is the result, costs in weed and pest control will take their toll on the gross margin. The old saying, 'well sown, half grown' has never been more true."

The next step is to start on just 10% of the farm to get the process established and see how the system works so it can be adjusted gradually, says Harry.

But he has a slight issue with this because some growers might have bought a £100k drill but don't sell their existing cultivation equipment. "In these cases, ▸

Claydon's Evolution direct strip till drills offer growers the opportunity to drill seed and fertiliser together.

▸ we've seen costs go up and yields dip, making the whole thing look like a bad idea."

Instead, he suggests employing a holistic system for the whole farm. But this doesn't necessarily mean getting rid of the plough. "If there's still soil restructuring equipment on the farm, it could be sold to reduce the depreciation bill but also so it can't be used to fall back on," he says. "If soil does need restructuring, do it, but it shouldn't be every autumn and a lot of cultivation could go if you're looking to reduce costs."

The cost of investing in a new drill might be something that prevents farmers from exploring min and no-till systems, so Harry suggests looking into collaborating with neighbours and perhaps exploring joint ventures. "Some farmers will work on a gentleman's handshake, but it's advisable to have something written down to cover new members joining, someone leaving and how sharing the drill would work, who is responsible for it and who buys parts for it."

It could also be worth sharing both a tine drill and a no-till drill, he adds. "A share agreement can allow you to have flexibility with a good capacity, specialist and expensive machine that's working across more hectares and therefore the cost per hectare goes down."

No-till systems do mean growers may have to accept drilling earlier in the autumn and potentially several weeks later in the spring, as these types of drills require good conditions to run, says Harry.

One caveat of using a no-till drill is that growers won't be able to run it late into the autumn, he warns. "If it rains and stays wet, you may have to consider sitting it out until the spring.

"So the key thing is being flexible in your approach and in the rotation. Have a contingency plan and accept that you may have to go in earlier and that this could well impact your grassweed control thinking."

It might also be worth considering flexibility with a drill, says Harry. "You might want to have a machine where you can put fertiliser or slug pellets in with the seed as well, but you could also end up having costly bells and whistles that never get used — so it's a case of balance."

When growers have begun implementing a min or no-till system with a specific drill, it's time to look at crop rotation and green manure cover crops, says Harry. "With reduced cultivations it might be that you can get away with longer rotations and have more of a split between winter and spring crops aiding weed control."

But the process doesn't end when all the steps have been taken, instead Harry advises continual learning and the adoption of new developments. "The less time you spend in the tractor seat, the more time is taken up by learning, crop walking and doing research. Consider becoming a member of organisations like BASE-UK and keep learning," he suggests.

As much as there's pressure from the government and public to make changes for environmental benefits, these should ideally be spin-off advantages of changing to a more productive and profitable system, he says.

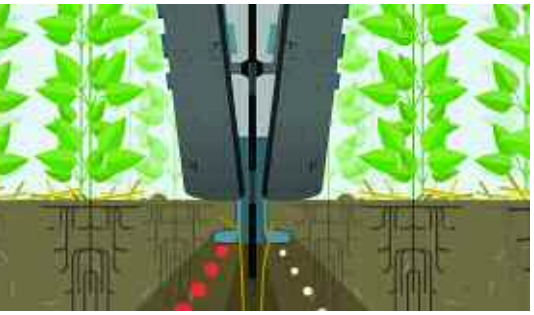
Even in countries such as Finland, Australia, Canada and the US, where steadier weather patterns allow for easier adoption of min and no-till practices, it hasn't been predominantly for environmental benefits but more because of cost, explains Harry.

"The drive is the farm business has to make a profit. Worms are great and flowers are fantastic but are they working to pay their rent? Look at it from an economic standpoint and the environmental benefits will come after. It will be critical for farms to stand on their own two feet financially over the next ten years."

So what different machines can growers look out for in the season ahead?

Novag's T-SlotPlus opener is designed to create a seed microenvironment.

The T-SlotPlus gives minimal surface-soil disturbance and creates an inverted T-shaped slot.



Novag

Growers who attended Groundswell in 2019 may be familiar with Novag's T-ForcePlus no-till drills. The French company, which has been around for the past ten years, focuses on regenerative practices and has units in operation across France, Australia, New Zealand and in the UK.

Antoine Bertin and Ramzi Frikha met 10 years ago in New Zealand and together decided to develop a unique opener design.

The T-Force Plus has a T-SlotPlus opener which is designed to create a seed microenvironment through the combination of two winged blades, one at each side of a central notched disc.

The T-SlotPlus gives minimal surface-soil disturbance and creates an inverted T-shaped slot. Seed and fertiliser can be placed separately on the adjacent horizontal shelves of the T, explains founder, Ramzi Frikha. “The Novag system gives the ability to place fertiliser more accurately and reduce losses.

“The Novag openers can handle high residue loads with minimal hair pinning, and they can establish crops in all conditions — from soft or min-tilled soils, flat paddocks to dry or rocky soils, or uneven terrain,” he adds. “They can handle very thick and diverse cover crops without blockages and without compromise on seed placement.”

Available in working widths of 1.2m up to 10m, prices start at around £50,000 (€60,000). The 3m and 4-4.5m models come with a 4200-litre hopper which can be split, while the 6m model has a 5400-litre capacity and the 9-10m version’s seed hopper is 7700 litres.

Seeds are distributed with two pneumatic metering units with sets of rotors on most models and, depending on the model, row spacings can range from 16.65-25cm.

Väderstad’s Inspire is a high-capacity double disc seed coulter drill that’s due to be available from the end of 2022.

Claydon

Claydon’s latest addition to the market is its range of Evolution direct strip till drills, which offer growers the opportunity to drill seed and fertiliser together. With working widths of 3m, 4m, 4.5m, 4.8m, 5m and 6m, they incorporate nine, 13, 15 or 19 tines, and most feature a 1910-litre hopper, with the 3m 3MF and 4m 4MRF versions having a 2700-litre tank, split 50:50 between seed and fertiliser.

Typical daily outputs range from 20ha for the 3m Evolution, which requires a tractor of at least 150hp to 40ha for the 6m version, which needs a minimum of 300hp.

The Evolution line-up, which includes ▸

Amazone's Cirrus 6003-2C can sow crops directly into a standing catch crop.

▸ a 5m unit and 4m rigid grain/fertiliser model, incorporates improved access to the metering unit to allow for easier calibration, while front-mounted discs — which are operated hydraulically from the tractor seat — can be specified for seeding into high residue situations.

Seed depth is controlled hydraulically, and second and third hopper options allow growers to apply different types, varieties and sizes of seed.

Hydraulically controlled front-mounted discs can be specified as twin tine and disc kit options for low disturbance drilling.

All models feature as standard a hydraulic fan, Artemis metering control, tramlining facility, front tine/17.5cm A-share configuration, together with a double rear toolbar and road lights.

Other features include quick-fit knock-on/knock-off coulter options for the standard leading tine. Multiple seed tool options allow a wide range of crops to be drilled across different soil types and situations.

Väderstad

The newest launch from Väderstad is its Inspire 1200S and 1200C drills. With 12m working widths, it's a high-capacity double disc seed coulter drill that's due to be available from the end of 2022.

The 1200S version is seed-only and comes with a 500-litre hopper. The combi version, the Inspire 1200C, has a 7200-litre hopper, which has two separate compartments to hold both seed and fertiliser. These are later mixed into the same airstream and placed together in the soil.

High drilling output is achieved with eight separate sections, which allows both the Inspire 1200S and C to operate with variable rate and sectional control down to 1.5m sections. Constant and even product flow from the hopper to the seed coulters is achieved via eight Fenix III metering units.

The double disc coulter system should allow it to adapt to any field irregularities, therefore keeping a constant seed depth.

The drilling operation is controlled via the iPad-based control system Väderstad E-Control, which is also possible to connect with an ISOBUS task control system.

Lemken

In late 2021, Lemken launched a new trailed drill in the form of its Solitair DT, which will be available from autumn 2022. The 4m and 6m drill options feature a leading tyre packer for reconsolidation, follow by a compact disc harrow with 465mm diameter concave discs for second step seedbed preparation. These are individually protected against overloads by lead springs.

For less intense tillage, vertical corrugated discs can be used instead. These penetrate the soil less, helping to reduce moisture loss and weed emergence.

If targeted reconsolidation of seed rows is required, a trapeze packer roller

Lemken's Solitair DT will be available from autumn 2022 in 4m and 6m options.

can be attached behind the disc harrow.

The hopper holds up to 5100 litres and is available in a dual version, which allows for combined seed and fertiliser seeding. Two variants are available: with the single-shot version, the fertiliser and seeds are placed in a shared seed furrow, whereas the double-shot version places fertiliser in a line below the seed level via separate fertiliser double disc coulters.

Amazone

Amazone has launched a new front tool for its Cirrus 6003-2 min-till drill in the form of a knife roller. The addition is an enclosed roller core design with chevron knife arrangement to provide additional crumbling on cloddy soils and to intensively shred crop residues. It cuts catch crops and tall stubbles at right angle to the direction of travel.

The knife roller should allow for even shredding and incorporation of residues, such as maize stubbles, to help with field hygiene. It should also allow growers to save an additional run with a mulcher, a roller or a disc harrow.

Crops can therefore be sown directly into a standing catch crop as it can be cultivated and residues incorporated simultaneous, if necessary.

The knife roller is set in a V-shaped arrangement to eliminated lateral pull. The soil adaption of the individual knife segments is achieved by a hydraulic pre-tension system, meaning the machine should operate evenly over the entire working width, even on undulating ground.

The roller bearing mounts and the knives are made of boron steel and the knife roller should be maintenance free because of its spherical roller bearings and face seals. ■

The knife-roller is a new front tool for Amazone's Cirrus 6003-2 min-till drill.