

Drills: The known unknown



“ELMs may have a hugely influential role in driving a trend towards less soil movement and disturbance.”

Machinery Drills

Crop establishment is so fundamental that farmers are always looking to perfect it, but trends in practices are changing and drill manufacturers have been adapting and innovating to deal with this. CPM explores the latest trends.

By Melanie Jenkins

confident in their heavy cultivations may be questioning whether they are doing the right thing.

“There’s a lot going on at the moment,” says Harry Henderson, knowledge exchange manager at AHDB. “ELMs may have a hugely influential role in driving a trend towards less soil movement and disturbance, with a lot of interest in carbon capture. But there are still a lot of questions unanswered.”

Evolutionary steps

Even the Countryside Productivity Grant may have caused headaches, as it offered funding for the purchase of no-till drills, but not for direct or strip till drills, he adds.

“Farmers may buy a no-till drill to slot into their existing system, where it might fail or result in reduced yield compared to a tine-based drill. A tine-based drill in the scheme could provide an ideal stepping stone to reduced soil disturbance.

“There’s no harm in paying more attention to compaction control and prevention rather than rectification, and generally coming out of the ground altogether in an attempt to reduce costs should always be a goal, no matter the future.”

The trick with moving into a no-till system is to make it an evolutionary step, says Harry. “Direct or one pass drilling could be an option when no-till could be too far. But there has to be an understanding of compaction and where it comes from.

“At the Cereals Event in June a speaker stated that at the end of a no-till drilling season, you should be able to clean the drill with an airline, but if you have to wash it, this might indicate poor establishment in the coming weeks.”

In no-till systems, farmers must get away from the trend to drill as late as possible to control blackgrass and go back to earlier drilling, stresses Harry. “Late drilling looks like the only option currently, but we have to challenge that thinking.”

And though there’s a lot of choice when buying a drill, it still boils down to tine or disc-based options. “Tines are more flexible and can operate across a wider ▶



Harry Henderson believes there are plenty of options on the market, but power requirement is key

Farming is evolving and the way crops are being drilled is all tied into this evolution; be it a reduced tillage system, direct drilling, or full cyclical regenerative agriculture. And the great question of whether the tine is mightier than the disc remains.

The diabolical weather over the past two years has resulted in a surge in purchases of lower disturbance drills after years of establishment being pushed further and further into the realms of shorter autumn days to deal with unforgiving weed burdens.

But as farmers are actively being encouraged to bring drilling dates forward to avoiding causing excess soil compaction, and as ELMs pans out into a creature of substance, even those



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Jeff Claydon firmly believes there is still a place for high hp when drilling in certain conditions

► type of conditions, whereas discs create much less soil disturbance.”

Harry says farmers must decide if they want to do only one pass every time, or if a more flexible approach — whereby they

cultivate ahead of a tine or disc drill when conditions are better — might be superior. “Sometimes a one-hit is ideal, but in late season autumn drilling, this could cause compaction issues.

Greater flexibility

“So flexibility is key for different soil types. If you’re working across multiple soil types — particularly given the past two autumns — then a tine-based drill gives the greatest flexibility,” he explains.

But even in one pass systems, there can be a dramatic effect on the labour profile, adds Harry. “Using a smaller drill, you could end up double-shifting to get it done, rather than if you had a large one.”

And where a plough and power harrow combination may be bulletproof for getting a crop established, farmers can get trapped in

that maximum disturbance system. “But those on non-inversion systems ought to keep reviewing if it’s still working from a weed control, compaction and cost versus yield perspective.”

Though the resurgence in spring cropping doesn’t appear to be slowing down, it takes strong nerves with a no-till drill to wait in the spring for when conditions are right, warns Harry. “When every local farmer is drilled up and you’re still waiting for the ideal conditions it takes nerves of steel, but I don’t think later drillers are losing yield.

“And sometimes, those going in early with a no-till drill find the field dries and the slot opens, suspending the seed and causing seedling death.”

Another trend that’s garnering more practitioners is companion cropping in a bid to tackle anything from soil erosion to nutrient retention and cycling. “There are drills out there which can drill two crops, and seeder kits which fit on the front to put in a companion with the cash crop,” explains Harry.

“There’s flexibility in this as you can put in seed, fertiliser and cover crop. If it could work on your system, it protects the soil surface and promotes nutrient cycling. And you can probably try it before taking the plunge and buying a drill set up for it, by using a cheap seeder on a small area.”

But what about choosing a machine? There are plenty of options on the market but one key thing to think about is the power required to pull the drill, explains Harry. “Beyond 50hp/m is too much as you’re going to need a heavy tractor to pull it, which links back to compaction control and the dangers of late drilling into soils that just can’t support the weight of the tractor.

“Farmers ought to consider their future system before going out to purchase a drill,” he advises.

“Consider a system change on farm rather than just getting a new drill. Though this requires you, your staff and agronomist to be

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Low disturbance from Deere

An all-till drill, the 750A is designed to create extremely low soil disturbance. It can be used for single pass drilling or after minimum or conventional cultivations. Available in 3m, 4m and 6m versions it has a large clearance for no-till drilling into stubbles.

It requires a minimum of 80hp to pull it and a max of 140hp. The 3m and 4m units come with an 1800-litre hopper, while the 6m version has a capacity of 2300 litres.



John Deere's 750A is designed to create extremely low soil disturbance.

on board with the changes, you could otherwise find yourself cultivating ahead of a drill which could establish in one pass."

Or there's a danger that farmers could buy a drill and instead of progressively adopting a system change go straight in with direct drilling or no-till when the soil just isn't ready for it, warns Harry. "Costs of production can end up going up rather than down through loss of yield.

"So it's about system design and rotation, soil type, rainfall and topography on farm first and then looking at the drill."

Regenerative agriculture is a relatively modern term for agroecological farming, says Harry. "It's perhaps a jazzy bandwagon to get behind, with a Marmite-type acceptance among farmers. And it's the same as conservation and sustainable agriculture — we have to see evidence that it could reduce costs substantially as farmers are still largely chasing yields. Maybe it's one to look at when

different payments — such as from ELMs — can support the transition."

So is there still a place for high HP? Jeff Claydon, founder of Claydon drills, firmly believes that there is when drilling in certain conditions. "There's more tillth and more success in establishing crops," he says. "Moving a small amount of soil helps the seeds germinate on our clay and the strip-till concept has been incredibly successful in the past two years.

"Some of the lower disturbance drills can be incredibly heavy, but we're trying to keep a constant 9.5km/h forward speed up and down hill to get shatter and breakage in the soil."

Jeff suggests farmers look at their own farm conditions and soil types before making a decision on hp but would always recommend a minimum of 50hp/m on any Claydon drill.

Time is the other factor which can be fundamental to drill ▶

The Novag T-Force range are true no-till, ultra-low disturbance disc drills.



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Age old concept

Though based on a concept dating back to the 70s, the principle behind the latest Kuhn Aurock is that it can be used both as a direct or conventional drill, according to Marcus Ainley, sales specialist at Kuhn. “The difference between this and other direct drills is it has a triple disc opener; so at the front of the machine is a serrated disc doing the hard work to cut into the ground, and the double disc seed couler behind it places a seed in line with the front one.”

The main advantages are a seed slot with a bit of tilth in it, and the front disc pressing any trash it doesn't cut into the ground away from the seed.

“The conditions in the UK are generally not the right conditions for direct drilling, so to be able to have a more universal drill to use in trickier conditions is an advantage,” he says.

“But the pressure can be backed off to use it conventionally, giving farmers versatility as they'll only need one drill. If they're making a transition from a traditional system to direct drilling, it might take a few years, so there may be some years they need to till a



The principle behind the latest Kuhn Aurock is that it can be used both as a direct or conventional drill.

field to get rid of things like compaction,” explains Marcus.

Available in 6m, the drill has an optional integrated crimper roller to lay cover crops flat, a single or twin metering split 3000-litre or 5000-litre hopper, 15cm or 18.7cm inter-row spacing and can be pulled by a 132hp or 180hp tractor — despite the largest model weighing 9.3t empty.

noticed is towards larger machines. “We offer 3m to 13.5m drills but over the past two years the average size sold has increased to boost output in tighter weather windows. However, the widest of our drills still only needs 25hp/m.”

A more recent development to the Eco XL model is a pressurised hopper which is designed to provide even seed distribution on the widest version. This model comes in widths of 8m to 13.5m, with a low draft requirement of 25-30hp, and can drill up to 10ha/h. The forward-facing tines do not need weight to gain penetration.

For those looking for something in between, the Virkar Ocean seeder has a leading tine followed by a disc and seed couler, making it not quite a no-till drill. However, it should promote greater flexibility on farm as it's designed to work across different soil types and in difficult conditions.

Seeds can be sown on a radius of up to 8m and maintain the distance between sowing lines on a curved trajectory.

With an 8000-litre hopper capacity which can be split 65/35 for solid fertiliser application, it also has two 1000-litre auxiliary tanks which allow liquid fertiliser to be incorporated without losing hopper capacity.

Weighing 8.6t empty, the Virkar can be pulled by a lower hp tractor, requiring a minimum of 180hp. ■

► choice. Running a 6m drill on his farm behind a 340hp John Deere means he can cover his 405ha in 105-110 engine hours. “Our time is one fifth of a

cultivation system. Every time I think of downsizing, I remember that I can stay with my 6m drill and cover 16ha in one afternoon without being late for tea.”

Turning focus to new kit, and offering true no-till, ultra-low disturbance disc drills, the Novag T-Force range does take a lot of hp to pull the larger models — up to 420hp for the T-ForcePlus 950, which weighs 18t empty.

However, the smaller models weigh as little as 1.8t and can be operated with just 70hp.

Available in 3m, 4m, 6m, 8m, 9m and more upon request, the drills can operate at 12km/h without disturbance of heavy residues. The double hoppers range from 180 litres to 7700 litres, with optional small seed bins.

Low disturbance

Whereas on the other end of the spectrum, and offering low impact and low draft requirement drills, Dale Drills' equipment can help farmers reduce their tractor size.

Delayed drilling has benefitted the firm as the more challenging, sticky, and wet conditions really let tines show their benefit, says director, James Dale. “But farmers can also go on early because they don't need to cultivate before as the seed is left closer to the surface.”

The other trend James has

One pass wonder

The Sumo DD (direct drill) and DTS (deep tillage seeder) are options for those wishing to do one pass, but they can have a high hp requirement.

Offering establishment flexibility, the DD comes in 3-9m versions and needs anything from 120hp to 500hp to operate.

The DTS comes in the same working widths but only needs 150-160hp to pull it.

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