Seeding system boosts precision and cuts compaction

ON FARM OPINION

With a split of heavy and light land, there's a need for two distinctly different rotations for one Suffolk farming business. *CPM* visits to find out how it matched the oilseed rape establishment to both.

By Martin Rickatson

Ask Richard Scott what he considers to be the most important item of equipment, and the answer won't be found in his machinery shed. Instead, he'll take you past the fairly minimalist fleet he uses across 520ha of owned, tenanted and contract-farmed Suffolk land, and into the office where he keeps his trusty penetrometer.

"It acts as my eyes underground, so that I can clearly identify not only where soils are compacted, but how far down," he says.

"I use it across the whole farm each year, and it's an invaluable tool. There are two very distinct soil types here, with two-thirds of the ground we farm being Beccles series clay, and the remainder a lighter Ashley series sandy loam. They require very different management approaches, from rotation to cultivation."

The rotation on the heavier soils has traditionally comprised two wheats followed by oilseed rape, with a plan to move to a sugar beet, two wheats, OSR or peas, wheat system. On the lighter land, meanwhile, cropping comprises wheat, OSR, wheat and sugar beet or vining peas.

"In a good season, the heavier clay is actually easier to manage, in that it's more obvious when it can and can't be worked," says Richard, who is BASIS and FACTS-qualified and carries out his own agronomy, backed by independent advice from the likes of NIAB TAG.

"If it requires subsoiling, then that's done ahead of the ploughing between first and second wheats. With the loam, the temptation can be to get on fields too soon after rain, and it's therefore much easier to damage, especially with spring cultivations.

"It's also actually more difficult to address compaction issues on this ground compared with the clay, which is naturally deep-cracking as it dries. That's where the penetrometer comes in — it's very useful in identifying areas that'll benefit from soil loosening. It compacts at a deeper level, so is particularly difficult to rectify."

For multiple reasons — among them moisture retention, compaction, weed burden and insect pressure, plus

Richard Scott says his penetrometer is his most invaluable bit of kit, acting as his 'eyes underground'.

> *"With the extra stress placed on the crop by the neonicotinoid ban, I'd been looking to get our conventional varieties off to a better start."*

commodity price — in recent years the way in which the business establishes OSR has come under review. Almost a decade ago, precision took second place to timeliness as subsoiler seeding replaced drilling with the farm's Väderstad Rapid.

"The idea had been pioneered by a couple of farmers near here, and like many others we soon adopted it when we saw the results that were achieved at low cost. We purchased an Opico He-Va 3.5m mounted Disc Roller plus Combi-Lift 3.5m subsoiler with seven legs at 0.5m spacing, and an Opico seeder to feed seed down the back of each leg.

"It was an effective system in most conditions and produced good results, loosening compacted ground and allowing the OSR to develop strong, straight tap roots. Subsoiling, tyre pressures and tractor weights are, to my mind, important influences on OSR rooting.

"Because no other land preparation was needed, we could more easily begin OSR establishment earlier, by mid-Aug, and take full advantage of available soil warmth and moisture. It was a successful system, and we used it over a period of eight years, until we changed our approach for this season."

Although he keeps an eye on the performance of new hybrids, and tries out small areas, Richard Scott isn't a big enthusiast, professing to be unsure as to whether current varieties give enough benefit to justify their seed cost.

"I also like to use around two thirds home-saved seed. So coupled with the extra stress placed on the crop by the neonicotinoid ban, I'd been looking to get our conventional varieties off to a better start."

Variety choice is based on a spread of early, mid and later-maturing varieties from the top of the Recommended List that have proven to work well on the farm's soil types. This year that consists of DK Cabernet, Sesame, Charger and a small area of the hybrid Harper.

Low disturbance legs to loosen compaction with minimal disturbance were high on Richard Scott's want list.

"As a rule, I'm disappointed if we don't achieve a 4.3-4.5t/ha average, but I'm targeting 5t/ha over the longer term. With the neonicotinoid ban looming during the past year, I knew that was going to be ▸

Shown here on a mounted machine, Accu-Disc units combine offset double-disc units and following press wheels.

▸ difficult unless we improved all aspects of crop management, and establishment in particular.

Drilling-depth consistency — something they couldn't influence greatly since switching to subsoiler seeding — therefore came back under scrutiny. "I wanted a system that would still give the ability to aid rooting through soil loosening, but create less disturbance than the subsoiler, and at the same time place the seed with more precision. That would hopefully boost establishment percentages across both light and heavy soils, and offer the potential to cut back seed rates." That's currently 5-7kg/ha according to soil type and conditions, he adds.

A trip to Agritechnica in 2013 provided an opportunity to assess different options on the market, and it was a seeding system developed by Danish firm He-Va that particularly caught Richard Scott's eye. Available in 3, 3.5, 4 and 5m working widths, with 5, 7 or 9 coulters, He-Va's Accu-Disc is designed to work attached to the rear of its Combi-Disc. This is a combination of the firm's Combi-Lift soil loosener with its latest low-disturbance legs and a Disc-Roller compact disc, for one-pass OSR establishment.

The loosening legs and tilth-creating discs lead, and the latter can be lifted out of work if the legs are creating sufficient surface tilth. Each Accu-Disc unit that follows comprises a double-disc coulter with press wheel, placed in line with each loosener leg. Once the leg has passed through, loosening the soil and creating a small amount of surface tilth, with a roller subsequently firming it, the Accu-Disc coulter opens a furrow and places the seed at a constant depth. Then the rear press wheel closes the slot and reconsolidates the soil.

The parallelogram mounting of the coulters maintains constant pressure at an even depth on uneven seedbeds. Each large double-disc coulter is mounted on a parallelogram, which in turn is mounted on a coulter bar. Individual rubber press wheels follow up, while working depth is controlled by a turnbuckle with a built-in depth gauge. Coulter pressure is provided by a spring and adjusted by a manual push-and-pull adjuster, allowing the coulter bar to be set to suit the conditions quickly and without the need for tools.

Trailed combinations

At the time, while He-Va had developed a version of the Accu-Disc for mounted implements up to 3.5m wide, it didn't offer an arrangement to fit trailed combinations. But following further dialogue at LAMMA 2014 with the firm and its UK importer, Opico, Richard Scott was promised that a 4m trailed model was on its way.

"I preferred the idea of a trailed machine as it gives more room for soil and trash flow, and hence provides a more level finish," he explains.

"We had the first trailed model in the UK, delivered in time for 2014 summer sowing, and while conditions were undoubtedly very favourable for OSR establishment anyway, it did just the job I wanted it to."

The first pass in summer 2014's OSR establishment was with the farm's Bogballe spreader, applying 25kgN/ha onto chopped straw stubble. This was followed by the Combi-Disc/Accu-Disccombination, operated behind the farm's 240hp Fendt 724, with the discs lifted clear.

One of the key changes in the soil-loosening element over Richard Scott's previous subsoiler system is the new array of 15mm-wide angled Combi-Lift legs. Although low disturbance, these points produce better soil flow when compared with the 25mm straight legs on the subsoiler the farm was formerly using for OSR establishment, he notes.

The result is a lower draft requirement, reduced fuel consumption and higher output, with working speeds up at 9km/h.

Discs follow the line of the legs, with no soil moved or seed sown in between.

He-Va's Combi-Lift loosener is followed by Disc-Roller cultivating discs, placed in work where needed, with Accu-Disc units at the rear.

The farm's subsoiler-seeder combination remains in its armoury for any issue of severe compaction, and in one field this season there's a side-by-side comparison, but shallower working is definitely benefiting the crop in the absence of compaction, he believes.

"We worked the legs down to 300mm, and at 15mm wide they're forcing only a narrow passage, so it's not working as a subsoiler," he points out.

"It's simply doing the job I need it to in terms of relieving surface compaction and aiding the vertical passage and development of the plant's tap root."

Ideal conditions with good weather, warm temperatures and sufficient moisture in the soil surface undoubtedly helped crops get away well last season, but emergence levels from the first sowings with the Combi-Disc/Accu-Disc were very pleasing, says Richard Scott. With the system having proven itself in that respect, next season he intends to trim back seed rates.

"Off the back of the subsoiler I was planting 5kg/ha of seed, but I cut this to 4kg/ha with the Accu-Disc. In 0.5m rows, the crop still came up very thickly, and I'd estimate establishment was 85-90%, rather than the 75% I'd budgeted. That's translated to 35 plants/m² or more in some cases, which is clearly too many, so there's definite scope for further reducing seed rates to 3kg/ha this summer if the weather's good."

The first half of the crop went in with 15mm of rain following soon after, he continues. "This undoubtedly also gave it a boost, but even the last of the OSR, sown in the last week of Aug and receiving only 3mm of rain afterwards, still came up well. There's much more consistency between light and heavy land crops."

What surprised him was how accurately the double-disc coulters placed the seed — a consistent depth of 15-20mm. "Combined with the press wheels, this produced the most even plant emergence and size I've seen on this farm."

This in turn meant more confidence with the pre-emergence clomazone herbicide.

"With subsoiler seeding, if it received heavy rain soon after application then we invariably saw a detrimental effect on germination and cotyledon growth. But because we're disturbing less soil, we're also seeing reduced weed emergence. It's interesting to see that the weeds which do emerge — our main issues are cleavers, hedge mustard and charlock — tend to be within the plant rows, where the soil has been moved, rather than between them. Perhaps in the future this could lead to benefits to be had from row-based spraying."

Aiming to eliminate anything which might slow emergence or vigour, he may even limit clomazone use to where there are known issues of hedge mustard and cleavers. "Then on fields where there's no significant early issue, the first herbicide will be metazachlor at the crop's cotyledon to first true-leaf stage. As well as cutting back seed rates, I'm also considering ways in which I might apply nitrogen only in the plant row."

Last summer was no great test for any OSR establishment system, but in a wet summer, the old subsoiler seeder may yet be pressed back into service, concedes Richard Scott.

"But that's only if conditions are really against us, in the sort of wet soils where the Accu-Disc units might block, and we have to revert to the subsoiler to drop the seed on top just to get the crop in within the second half of Aug.

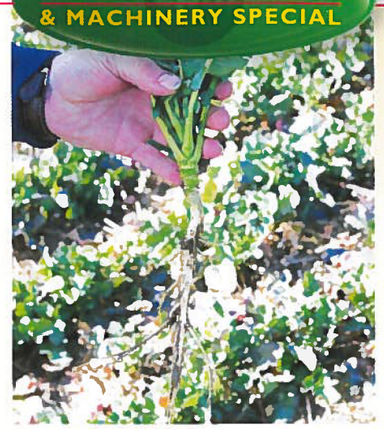
"In the majority of seasons I think the Combi-Disc/Accu-Disc combination will give us improved spacing, improved depth, just enough surface soil movement to guarantee seed-soil contact, and enough sub-surface movement to remove any compaction in the upper soil profile.

"What I want to see are those penetrometer readings coming down, and OSR establishment, rooting and yields increasing as a result. On the evidence so far this season, I think that's what our new OSR establishment system should give us." ■

Farm facts

Lampits Farms, Thorndon, Eye, Suffolk

- **Farm size:** 520ha
- **Soils:** Two thirds Beccles series clay; one third Ashley series sandy loam
- **Staff:** Richard and Jane Scott plus one full time and two harvest casuals
- **Cropping:** 293ha first and second wheat, 104ha oilseed rape, 56ha sugar beet, 30ha vining peas
- **Tractors:** John Deere 7930, Fendt 724, JD 6820
- **Combine:** Claas Lexion 660 with 7.5m header
- **Sprayer:** JD 792i trailed 3000-litre with 24m boom
- **Spreader:** Bogballe 24m twin-disc
- **Drills:** 6m Väderstad Rapid, 4m Opico He-Va Combi-Disc/Accu-Disc



Compaction must be addressed on lighter, non-cracking soil if roots are to grow downwards towards moisture and nutrients.