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Weed potential pulverised

On Farm Opinion

Growers grappling with grassweeds are investigating the efficacy of harvest weed seed control. *CPM* visits the first unit of its type in the UK and reports on a ground-breaking farmer-led trial taking place this harvest.

By Tom Allen-Stevens

The first thing you hear on arriving at West Stoke Farm is a distant whining noise. Harvest is in full swing, and Nick Rowsell can be found rapidly feeding the dryer.

He breaks off briefly before the next trailer of wheat arrives. “The noise? It’s the Redekop Seed Control Unit doing its thing.” He gives a wry smile, “It hasn’t gone unnoticed in the village, especially when we had it engaged late one night when harvesting oilseed rape. We’re in the suburbs of Winchester and crops are seen as an inconvenience. So currently, we bring the unit in and out of action depending on the field we’re in.”

Nick is the first farmer in the UK to try one of the first European prototypes of the Redekop SCU. It’s a mill that processes

the chaff, retrofitted to his John Deere S680i combine harvester that was purchased in 2017. He’s been trying it to see how harvest weed seed control (HWSC) can contribute to tackling grassweeds, and how the prototype model can be adapted to the North European climate, harvest and weed spectrum.

Sterile brome

“Spring barley is our biggest crop, so blackgrass isn’t really an issue. Sterile brome is becoming a problem, though, and options to control it, especially in barley are very limited. HWSC is another option, and an area that hasn’t really been explored in the UK, although it’s proven successful in Australia and elsewhere, I understand. That’s why I was keen to give it a go.”

Just then, another trailer arrives and Nick heads back to the loader, waving an instruction to “find the combine — just follow the noise.”

He farms 1400ha of the rolling Hampshire fields north of Winchester. Everything overlies Andover series chalk, whether that’s clay caps or the thinnest top soil, and there are some steep slopes with a high flint content. So the business has two JD 680i Hillmaster models that bring it all in. The newer one, working its way through a field of Skyfall winter wheat, has a 9.16m header and is fitted with the prototype SCU.

Apart from the noise, there is a lot of dust. The unit sits at the back of the sieving shoe and processes all the chaff. Any weed seeds that pass through the combine and come out through the chaff are received by two vertical axis rotors. Operating at 2850rpm, the rotors move the seed through a series of rotating and stationary tungsten carbide-coated columns at up to 400km/h.

It’s the thrashing the chaff receives that destroys 98% of harvested weed seed and results in the fine dust that plumes out the back. Inspecting the residue, it does look very different, and you can see to a line where the SCU was engaged once the headland had been cut. It operates



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independently of the chopper, that hasn't been engaged. So in between the undisturbed swaths you can barely make out any residue at all, let alone weed seeds.

Operating the combine is Andy Young, and on joining him in the air-conditioned cab, as soon as the door closes, the noise dims to a distant hum. "You can hear it, which is kind of reassuring, but it's no bother," he says. "And although there's a lot of dust it's guided out the way and doesn't clog up cooling grills.

"We've had John Deere combines since I started here in 2005, and I've always liked the CTS (cylinder tine separator) system. The current model has Auto Adjust features that ensure the feed and threshing settings achieve the optimum sample. The Hillmaster feature seems to work particularly well, and never overloads the sieves, even on the steepest slopes," notes Andy.

The Redekop SCU was developed first for John Deere combines and can be retrofitted to larger 600i and 700i-series combines. "It wasn't a simple Ikea job to fit this one. There were quite a few modifications. The main one was to the rear axle — it sits quite low and the rear wheels had to be adjusted to accommodate. This has widened the turning circle and can make it awkward when navigating narrow lanes.

"There have been the inevitable teething problems — there are latches which hold the doors that channel the chaff. These broke and in the end we had to weld them. We've worked closely with the Deere dealer, Hunt Forest, to sort out any issues."

Conscious that the European prototype



Andy Young (left) finds putting the unit in and out of work relatively quick and simple, with a rather neat clutch disengaging the drive (right).

would present a number of design challenges, Redekop has followed progress closely. The turning radius issue has now been resolved, and newer units are narrower. The latches have been adjusted, says the company, to ensure the internal doors operate correctly, and work has also gone into altering the design to reduce the noise.

Engineering thought

When engaged in operation it works well, and Andy appreciates the engineering thought that's clearly gone into the design to integrate it with the combine. The control systems come up on the ISO-compatible terminal in the cab with settings and adjustments easy to make. Maintenance is straightforward, he says, with three extra grease points to attend to.

"Having the unit engaged does make a difference to power and fuel use," he notes. It's a good sunny day with a ripe crop, and the combine's currently using

14-15 l/ha of fuel. This is more like 12-13 l/ha with the SCU disengaged.

"We've only had one crop it hasn't been able to process — we tried it on some buckwheat, but the long stems wouldn't go through the rotors. It doesn't like particularly green or weedy patches of oilseed rape, and it struggles with



The rotors receive the chaff and weed seed from the back of the sieving shoe and move it through a series of rotating and stationary tungsten carbide-coated columns.

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unripe oats," he adds.

The SCU runs in common harvest conditions without issue, says Redekop. The company's aware of bridging and plugging issues, that equally cause difficulties for the combine threshing mechanism itself, and a number of solutions to improve crop flow have now been developed.

Andy finishes the field and stops the combine to take the unit out of play.

A simple and rather neat clutch disengages the drive — there are no belts or pulleys to move. The SCU moves on chopper slide rails allowing access to rear internals. A series of doors are then adjusted to redirect chaff flow.

In all, it's a 2-3 min job, although Andy notes that engaging the SCU after a period working without it takes longer. "You have to clear off the chaff that's built up in various areas before you can bring the

doors back into position, and you have to ensure the mill is clear of debris before it starts up," he notes.

Catching up a few days later with Nick, he talks through the cropping and herbicide strategy and how the SCU fits in. "We don't have a fixed rotation but we do have rules," he says.

Only first wheats are grown, making the most of market opportunities. Spring barley is the main crop, with winter and

BOFIN farmers look to weed-seed destruction

A farmer-led trial is taking place this harvest to put the Redekop Seed Control Unit through its paces. Three units have been imported and fitted to the combines of growers who are members of the British On-Farm Innovation Network (BOFIN). The results will be closely monitored by NIAB weed scientists.

The unit was developed by Redekop, a company based in Saskatoon, Canada, best known for its MAV straw chopper, that has already achieved notable global success. The company had set its sights on bringing growers a total residue management solution, explains Redekop co-owner and president Trevor Thiessen.

"We'd already put significant work into developing residue management systems, so looked to design an HWSC mill that was as seamless as possible — one that was easy on, easy off, so growers could bring it in and out of play with the minimum of fuss," he says.

HWSC systems have proven popular with Australian growers in particular, who struggle with glyphosate-resistant ryegrass. The Redekop mill itself is a step-on from an integrated unit developed by researchers at the University of South Australia, funded by the Grains Research and Development Corporation (GRDC). "Researchers found if you hit a weed seed hard enough four times it renders it unviable," explains Trevor.

What's different about the Redekop mill is that this is achieved with five rings of tungsten-carbide coated columns — two rotary and three stationary — that clobber the seed at speeds of up to 400 km/h.

The company worked with Dr Breanna Tidemann of the Canadian Government's Lacombe R&D Centre to establish its efficacy and weed spectrum. "Following a known protocol, independent testing established up to 98% of weeds are destroyed. We also tested a wider spectrum of weeds compared with the GRDC-funded Seed Terminator," notes Trevor.

"While the SCU has been a success in Canada and Australia, we're seeing a significant increase in interest in Europe, driven by the need to find alternative weed management solutions. As well as working with NIAB in the UK, we have been

developing understanding of the SCU's efficacy in European conditions with French crop-research institute Arvalis."

A second unit was imported into the UK last year and fitted to a Case IH 7230 combine used by NIAB at its farm near Cambridge. This was tested on a field infested with meadow brome, notes NIAB senior trials manager Will Smith.

"We counted weed panicles in a test area before harvest and assessed shedding and combine header losses. Based on these assessments, we calculated that on average 77% of the seeds were harvested and passed through the mill," he reports.

Monitoring of weed seedlings that germinated in the following crop showed the SCU reduced the population by 83%.

As well as John Deere and Case IH combines, units are also now available for recent Claas and New Holland models and can be retrofitted. Redekop is working with Howard Marshall in the UK, a company with specialist experience in fitting and running the units.

The concept of conducting an on-farm trial this year was put to BOFIN members and strong interest came back from farmers keen to take part. The three farmers selected not only have compatible combines but also a weed spectrum likely to give useful results.

Jake Freestone of Overbury Enterprises in Worcestershire is having his new John Deere S790 combine fitted with the unit to tackle a tricky



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problem with meadow brome. In Suffolk, Adam Driver has found his Claas Lexion 8800 puts blackgrass seed into its chaff lines, so results from the SCU will be monitored closely to gauge the difference it makes. For Ted Holmes, Velcourt farm manager in Warwickshire, who operates a New Holland CR9.90, ryegrass is grassweed enemy number one.

A keen interest was common among the dozens of other growers who came forward. They've been brought together into a 'Knowledge Cluster', co-ordinated by BOFIN, of 69 farmers, weed scientists and knowledge exchange managers who met at an introductory webinar last month. The group will be given regular updates, will share experience and help shape the project, which may run for two years, depending on first-year results.

Trevor believes it's a system that'll appeal to UK growers who are proactively seeking alternative methods to control grassweeds. "The SCU is a tool farmers can use to future-proof their weed control system, as herbicide resistance grows and chemistry loses its approval for use. Farmers who use it say it's a tool that can help them get on top of a weed problem before it gets on top of them," he concludes.

● For more on the weed seed destruction Knowledge Cluster, which is free to join, go to bofin.org.uk

spring oats, including a contract for Jordans. There's also winter linseed and 200ha of OSR in the rotation.

"Our biggest problem is controlling sterile brome in spring barley. It gets a cover crop in front of it which we treat with graminicides. The jury's still out on when's the best timing for burning down the cover — we've applied glyphosate eight weeks earlier, six weeks and the day before drilling. We seem to get best control of sterile brome somewhere between six weeks and the day before," he reasons.

"But there's plenty that appears in the crop, and roguing doesn't help — you still get immature green plants that come through to harvest."

The farm hasn't used a plough since 2003 and has two drills: a 6m Horsch Sprinter with Dutch openers that are changed from 25mm width up to 90mm, depending on the job in hand, and a 6m Amazone Cayena. "I'd really like two Horsch drills, but we're looking for something with less disturbance. We've tried the Avatar and the Sky EasyDrill. The Avatar did a good job, but won't last long on our flints," he notes.

Feeling that he's already making best use of the cultural options available is what led Nick to HWSC. "It does open up a different window to control grassweeds that we're currently not exploiting in the UK. The other element is that our current system is heavily dependent on glyphosate and I wanted to gather some experience in case we lose it as an option," he notes.

Installed in time for harvest 2020, the SCU was engaged for most of the cropping. Last harvest, the West Stoke team were more selective in how it was used. "The milling process definitely happens, but what we haven't done is a proper scientific assessment of the results. As a consequence, it's very difficult to understand the benefits, and just what proportion of weed seed passed through the unit."

Nick's taken the decision to remove the SCU for this harvest. "It hasn't proven to be the most reliable machine, but then a lot of that is probably down to the fact it's the first unit in the UK and the unfamiliarity with it of everyone involved.

"But I'm glad I've had the experience. I'm now looking forward to seeing how the technology develops in the UK and



Having the unit engaged does make a difference to power and fuel use, requiring around an extra 10% of each.

hearing the experience of others. The balance of chemistry is never going to weigh in growers' favour, so now is absolutely the right time to explore HWSC," concludes Nick. ■

Farm Facts

West Stoke Farms, Stoke Charity, Winchester, Hants

- **Farm Size:** 1400ha
- **Cropping mix:** Spring barley, winter wheat, winter and spring oats, oilseed rape, winter linseed
- **Soils:** Andover Series chalk with clay caps and high flint content
- **Farm staff:** Three full time, one part time, plus Nick Rowsell
- **Mainline tractors:** John Deere 6215R, 6195R, 6155R
- **Combine harvester:** 2x John Deere 680i Hillmaster with 9.16m header
- **Drills:** 6m Horsch Sprinter; 6m Amazone Cayena
- **Main Cultivation equipment:** 2x 4.6m Simba Xpress; 7.5m Claydon straw rake
- **Sprayer:** 24m Knight self-propelled with Airtec and 4000-litre tank



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