

Old lessons hard learned

Sustainable solutions

Complacency is not an option when it comes to grassweed management and in years where forces favour them, it's more important than ever to prioritise cultural control methods. CPM explores sustainable approaches to help manage the pressure.

By Melanie Jenkins

If there's one take home lesson from this season, it could be argued that it's how grassweeds shouldn't be underestimated. Given an inch, they'll take more than a mile.

As a result, this coming autumn will be key to hitting the reset button and getting on top of blackgrass, ryegrass and brome, highlights Agrii's Colin Lloyd. "Last autumn saw the highest and worst case of late blackgrass germination I've seen in my career and it later went on to influence things in the spring. Now growers feel as though they've gone back years in their grassweed control."

So how have things ended up where they are? "Last autumn there was a lack of grassweed germination in the dry, stale seedbeds," explains Colin. "At our Stow Longa site we had our first meaningful blackgrass chit on 4 October, but the real flush happened on 14 October. For anyone drilling in September, this was a real problem."

Delaying drilling has been used to control blackgrass for years, and although this isn't a great option on heavier land, Colin says what this actually means is to not drill the worst fields early. "Use a red, amber and green system to prioritise. We know the most troublesome blackgrass fields tend to be the heaviest and wettest going into winter.

"Last autumn, we had good weather at the end of September and growers worried they wouldn't be able to drill later so decided to plant wheat early, resulting in blackgrass issues."

Profit or loss

At Agrii's Stow Longa site in Cambridgeshire, wheat was drilled on 26 October. Where soils were min-tilled or direct drilled, crops had 280 ears/m² of blackgrass, but where the plough was used as a reset tool there were only 4-10 ears/m².

"As we know, 100 ears/m² of blackgrass causes 1t/ha loss in crop yield, so that's a 3t/ha loss in the min-tilled and direct drilled areas," says Colin. "On farm, this can be the difference between profit and loss. Also, if you can't get onto a field to drill in the autumn, there's the option of spring cropping meaning you can cultivate and spray glyphosate beforehand to break the blackgrass cycle."

For growers who don't want to revert to the plough, Colin clarifies that this is fine, but by continuing to min-till or direct drill, there'll be higher levels of grassweeds to contend with.

Colin flags that optimising cultural methods goes a long way. "In the ploughed plot at Stow Longa where the herbicides were applied, there were 4 ears/m² of blackgrass, demonstrating over 80% control

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from the herbicides. But in the min-tilled and direct drilled plots, there was still 80% control — but of a lot more blackgrass. Colin stresses that this is why cultural control is important, with one option being to plant hybrid barley. "The competitive element of hybrid barleys means it's more robust in a grassweed situation, something our trials have shown repeatedly.



Blackgrass has been so rampant this year that even hybrid barley has struggled to outcompete it, says Colin Lloyd.

“But this year, where we’d expect robustness from hybrid barley and little difference in yield, we’ve seen losses of 3t/ha — something I’ve never seen in my 20 years of work at Stow Longa. If we’ve experienced this in barley yields, what could happen with wheat?” he questions. Colin believes this could be due to slow establishment in the cool spring conditions.

But blackgrass isn’t the only weed running riot. “Brome is mostly only present in the min-tilled and direct drilled blocks at Stow Longa, and had built up over the past few years in those situations.”

To tackle soft brome, the weed seed was left undisturbed on the surface to allow the minimum of a month required to germinate ahead of a herbicide application. “This partially worked and subsequently the winter barley had little soft and meadow brome present, but instead we ended up with sterile brome throughout.

“Conditions which were wrong for one weed were right for the other. It’s worth bearing in mind that transitioning from ploughing to min-till will likely change your grassweed species.”

Tackling brome

On a positive note, Colin believes brome is easier to beat than blackgrass. “You can either go back to ploughing or bring in spring cropping. Where we’ve done this at Stow Longa it’s broken the brome cycle very quickly.”

Ryegrass has also presented growers and agronomists with difficulties this season, according to Agrii’s Steve Corbett. “This year, even the tried and tested methods to deal with the weed have been challenged.”

Since 2019, work on blackgrass at Stow Longa has been copied and used at Agrii’s ryegrass trial site at Olde Appleton in the Vale of York. “We quickly learnt that if ▶



Steve Corbett advises going back to the fundamentals to tackle ryegrass by digging a hole to inspect soil structure and plant roots.

Active management

When it comes to chemical control, Agrii’s Jodie Littleford highlights similar strategies can be applied across grassweed species, but that it’s important to first focus on cultural control to relieve pressure on the chemistry, and reduce genotype exposure and resistance risk.

Then it’s a case of thinking about mode of action groups and what the residual base will be in any pre-emergence sprays. “Think about mixing modes of action, using multiple actives and a stacking sequence approach as well as using the strongest chemistry available,” she highlights. “We’ve had new modes of action introduced in the past few years with cinmethylin and aclonifen, which have shown to be strong contributors to grassweed programmes.”

Jodie advises considering where an active fits in a programme and which partners will work best, and then how to sequence. “Also think about how actives will behave in terms of solubility and persistence, with the former contributing to how readily the active can leach, but the more soluble, the more plant-available it is.

“Also factor in the binding strength and absorption of the molecule as well, as some actives bind more tightly to the soil, which contributes to mobility and bioavailability. Then consider the half-life in the soil before it degrades. This varies depending on the weather, with warmer weather causing the active to degrade faster.”

It’s about building programmes around

actives that provide lots of different attributes, she says. “For example, including those which work in wetter and drier conditions, have a shorter half-life or stick around for longer. Mixing them together is essential to try and cover all your bases.”

Looking at the number of actives to include in a pre-em mix, one or two just aren’t enough to provide a robust programme, warns Jodie. “If you have catchy autumn conditions, you won’t necessarily have the opportunity to come back for a peri-em top-up. So making sure you apply a robust front-loaded pre-em is the best start, and come back within 48 hours of drilling, because delaying further has been shown to reduce efficacy.

“Including three modes of action and three active substances is a sweet spot against blackgrass and ryegrass, especially when you’re introducing new products such as Luxinum Plus (cinmethylin), then you’ll see a jump in the baseline of control.”

Jodie points out the importance of one particular active. “Avadex (tri-allate) still has its place, and our trial work has shown it to be most beneficial where less robust options, such as a flufenacet base, are used. But where used with cinmethylin or aclonifen there’s still an improvement although it’s smaller.”

A cinmethylin base provides the best control, according to Jodie. “We’ve partnered it with Pontos (flufenacet+ picolinafen) or Orient (pendimethalin+ picolinafen), both bringing benefits of some broadleaf weed control



A herbicide programme should involve mixing modes of action, using multiple actives and taking a stacking sequence approach.

as well as activity against blackgrass and ryegrass.

“Plus, we’ve seen incidental control of brome, but this will have to be backed up by bringing other chemistry such as Avocet (pyroxsulam). Brome is a challenging weed but a cinmethylin base followed up with mesosulfuron or pyroxsulam seems to be among the best options.”

Jodie stipulates that it’s not a case of relying purely on pre-em’s. “This season, a lot of grassweeds flushed through late, so following up with the likes of Octavian Met (diflufenican+ flufenacet+ metribuzin) and Pontos, or Orient mixes, depending on what you’ve applied before, show good results. And where required, come in with contact chemistry.”



Rob Daniel is exploring the use of cover and companion crops to provide ground cover and help tackle ryegrass.

► blackgrass at 100 ears/m² takes out 1t/ha of wheat, 500-600 ryegrass ears/m² will flatten the entire crop."

However, Steve says the positive results of a plough reset were clear. "Before we started the trial work, the site was under a min-tillage regime for quite some time, and so perennial ryegrass was winning."

What also became obvious was that soil structure had to be addressed, says site agronomist, Rob Daniel. "The site has high silt content which over winter would run into the clay where we'd ploughed causing blocks and constrictions, meaning plant roots weren't penetrating further than 5-8cm. Water had nowhere to go so we had waterlogging and the ryegrass was having a field day."

But by improving the soil structure, the cash crop can compete, says Steve. "This might seem obvious, but it can be missed. Go back to the fundamentals — dig a hole to inspect structure and plant roots and find out why water isn't moving."

At Olde Appleton, a low disturbance

subsoiler was used after the plough to break through the silt and move water. Since then, the land has yielded a spring barley crop just shy of 10t/ha — something it's never done before, says Steve.

"Step one of tackling ryegrass should involve looking at soil structure. Step two is moving water, step three is encouraging rooting depth, and step four is resetting with the plough," he adds. "But don't plough and then plough again, because as with blackgrass, this brings the seed back up."

Rob is now exploring the use of cover and companion crops to provide ground cover and help tackle ryegrass with one notable example. "We decided to plant Westerwolds ryegrass which is outcompeting perennial ryegrass, it's been staggering how quickly the organic matter built up in that area, transforming the soil structure and then cutting it before it seeds in the spring." ■

Application

Chemistry is the final piece of the jigsaw, after tools such as rotation and cultivations, explains Agrii's David Felce. "But it's unlikely that whatever you've done with your cultivation system, it'll have removed the requirement for herbicides."

David highlights that most work on application techniques is carried out on small trial plots with a pedestrian application, but Agrii has undertaken work on crop application with an adapted tractor-mounted sprayer, using a 12m boom at 10-12km/h, which is more representative.

The mechanics behind spray application means the choice of nozzle can be critical, says David. "The complications come with the product labels and legalities of application. For example, many products you'd mix with Luxinum Plus (cinmethylin), carry the interim buffer scheme requiring the use of drift reduction technology (DRT) nozzles.

"Some of the typical air induction nozzles, which a lot of people use, have three-star ratings which comply with DRT, but they're typically used at three bar which is often outside the range at which they achieve the three-star rating," he explains.

"We've increasingly looked at nozzles with four-star ratings, achieving 90% drift reduction, because even if you're operating them at a point at which they lose the four-star score, they usually still retain a three-star rating.

"Nozzle type isn't just important but also size, because it has to deliver the water volume in the pressure sweet spot," he adds.

To determine the difference application technique can have, Agrii ran a trial looking at

three different options. "The first treatment looked at best practice, even though it would be illegal, the second looked at legal best practice, and the third at a more rushed application at 100 l/ha."

Although the cost of the products in the tank will remain the same regardless of the level of control, David points out that doubling the water volume reduces output by 33% on average, because of the logistics.

All treatments had three different separate applications, one of Luxinum Plus and Orient (pendimethalin+ picolinafen), with a control of Liberator (flufenacet+ diflufenican) and Defy (prosulfocarb), and a final tank Luximo and Orient with Backrow adjuvant.

The first treatment involved applying at 200 l/ha using a non-compliant Defy 3D nozzle. "This is best practice but not DRT compliant. Right across the board we achieved mid 90% control," says David.

The second treatment also involved a water rate of 200 l/ha, but with a DRT compliant nozzle. "We dropped down to around 80% control. I think there's a compromise in many cases between drift reduction and efficacy, and of course there's legal compliance to acknowledge.

"But what was important in this treatment is that the addition of Backrow increased control by about 6% compared with the mix without it. From 12 years of data on Backrow and a pre-, peri- and post-em, the average uplift in control is about 9%.

"What we see with certain adjuvants is although they provide drift reduction benefits to well-timed and well-applied sprays — such as in the first trial — there was less control benefit from



Nozzle type isn't just important but also size, because it has to deliver the water volume optimally.

them," explains David. "But as timings or spray quality or target difficulty increases, you tend to see more of an advantage from using the correct adjuvant."

While the third treatment saw water rates lowered to 100 l/ha to improve output and used an air reduction nozzle to help with drift, it might not be legal in the way it's being used, says David. "The level of control dropped down to around 50%, and although the Backrow added considerably to control, it wasn't enough to match the levels in the first and second treatments.

"Adding an adjuvant won't make a bad application as effective as a good one but can offset many of the variables in the field. And this also indicates that water volume does play a big part, along with nozzle choice."

He highlights that 200 l/ha of water volume for pre-em residual herbicides will provide the best results, but stresses that growers should check product labels for restrictions.