



Blackgrass: never forgotten

Lampport open day

Agrovista's flagship trial site began life investigating innovative blackgrass control measures but later evolved into a full soil health showcase. Luckily, the team never lost sight of that original goal, a tactic proven valuable this season. CPM visits Lampport AgX.

By Janine Adamson

Now in its tenth year, Lampport AgX continues to attract the crowds, lured by the promise of new findings and perspectives on sustainable farming and soil health. And because it continues to deliver, the site in Northampton remains a valuable resource for knowledge transfer.

However, this season's extreme grassweed pressure has meant the experts at Lampport have had to return to their roots to provide much required insight on blackgrass management.

Because that's how the site began — a demonstration of crop rotations and cultivation practices to help with blackgrass control on heavy land. But what it now offers is wider context, even when asked to loop back full circle.

Technical manager, Mark Hemmant, says although the team aims to share something new each year, it's also about reinforcing the value of solid agronomic practice. "Year in year out Lampport has shown best practice

for blackgrass control centres around minimising soil movement, planting cover crops and utilising spring cropping."

Tactical chemistry

"This is then supported by tactical use of best-in-class chemistry. Combining all this together is the way to achieve results, even in a challenging year such as this season. Of course, the added benefit is it's looking after the soil at the same time," he says.

To demonstrate, Mark and the team devised a trial to understand the performance of some of the leading herbicide actives when used within a direct drilled scenario at three levels of stubble cultivation — straw-raked, shallow-disked at 3cm and shallow-disked at 8cm.

The work compared Luxinum Plus (cinnemethylin) plus PicoMax (pendimethalin+ picolinafen) with Proclus (aclonifen) plus Coliseum (flufenacet+ diflufenican), both with and without Avadex (tri-alleate).

"Luxinum is mostly root acting but is also claimed to have activity directly on the seed," says Mark. "In previous years we found both products to have similar activity on blackgrass, but given the seed claim, we wanted to investigate whether Luxinum would be a better option in a direct drilled scenario where blackgrass seed is left on the surface."

Rather than a second wheat, which has proven to foster blackgrass populations at Lampport, the previous rotation was a phacelia-based spring cover crop which was then burned off and cultivated in-line with the trial's protocol.

According to Mark the results were clear, not moving soil is the correct thing to do even when faced with dry conditions and an under-performing stale seedbed. As for

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comparing chemistry, the results weren't so clear cut.

"Statistically, the herbicide treatments performed no differently, however visually, it was the Proclus plus Coliseum which came out on top," he says.

"This could again be down to Proclus's ▶



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► mode of action, but this time lending itself better to the arid soil due to its persistency. What really stood out is the value of Avadex, which made a statistical difference to blackgrass control across all scenarios.”

He believes because the efficacy of Avadex declines less than other herbicides in droughted environments, the product has shone even more. And whereas in the past Lamport has been all about blackgrass, like many growers, the team's now experiencing a problem with resistant Italian ryegrass, which Avadex can help to control.

“Using the plough has always been a no-no for us, but to achieve control of ryegrass we'll have to reintroduce it on a rotational basis. It's important we don't provide blanket advice, so in this case, cultural control methods will be even more vital,” he explains.

But what about those looking for something new to talk about? Again, Lamport rose to the occasion. This year, as a result of 2022's nitrogen crisis, the team challenged themselves to feed a crop

of wheat with beans, in other words, successfully bi-crop.

The replicated trial involved sowing at three rates — solo wheat at 350 seeds/m², wheat plus 20 beans/m² and wheat plus 40 beans/m² (the standard rate). To help the wheat to compete, Mark says Avadex and a herbicide programme were used to help control blackgrass.

Nitrogen regimes

This was then overlaid with differing nitrogen regimes — untreated, 180kgN/ha, 90kgN/ha, and a combi approach of 130kgN/ha topped up with 30kg of controlled release fertiliser, MZ28. The final variable investigated was destruction timing of the beans — removal at T1, T2 and taken through to harvest.

At the time of CPMs visit, the crop was still standing with full detailed assessments yet to be made. “From an initial visual perspective, the work clearly shows that if you rely purely on beans to provide wheat nutrition, the crop will yield awfully,” says Mark. “However, the crop treated with 90kgN/ha appears to show a benefit, even when the companion crop is destroyed at the earliest timing.”

According to Mark, this means planting wheat with beans could enable a reduction in nitrogen applications, although he says it's important to carefully calculate the return on investment. “Bean seed isn't cheap, so from a basic margin perspective it's likely to depend on the price of nitrogen at the time, which is highly variable.

“What's difficult to account for is the impact on the following rotation known as the legacy effect. We plan to monitor this during the next year to see if it's possible to attribute an agronomic value to companion cropping

that's tangible,” he says.

And although the trial was initially instigated in response to the high price and low availability of inputs, Mark hopes Lamport visitors will find the work useful given the Sustainable Farming Initiative (SFI) now pays for actions such as companion cropping.

Yet this isn't the first time Agrovista has trialled companion cropping at Lamport — a highlight of 2022 was a crop of winter oats grown alongside winter beans with no inputs bar the seed itself.

The beans were direct drilled on 28 October 2021 at 38 seeds/m² followed by oats at 340 seeds/m² on the same day. To compare, a conventional plot of oats received 120kgN/ha plus a robust plant protection programme.

Results-wise, the oats yielded 9.36t/ha with an additional 0.42t/ha of beans — a combined yield of nearly 10t/ha. To push this further, farming systems R&D advisor, Niall Atkinson, says they're trialling it again this year but this time for a spring crop. “Again, our input costs are only the seed and the glyphosate pre-drilling. So far, the crop looks reasonable and is very clean.

“The objective is to maximise oat production through using beans for added nutrition and notably, to help rooting,” he says. “To that respect, there's the question of whether in this scenario, there'd be a benefit from using seed-bed nutrition such as DAP. This is because beans can't provide nutritional benefits to the oats until root nodulation, when the N-fixing takes place,” says Niall.

Given this is off the back of a winter crop, therefore breaking one of Lamport's golden rules, Mark says he's interested to see how the approach impacts weed control. ■

Carbon calculations for cover crops

The hard work is beginning to yield results for PhD candidate David Purdy. Having used Lamport as a base for his research, he now has the data to calculate the carbon capture potential of cover crops both no-till and deep tillage over five years.

David's project is based around the concept of 'getting energy back into soils', the valuable role of photosynthesis and capturing carbon throughout the season. “Plants are a photosynthetic vessel, transporting carbon into the soil while offering a wide range of additional benefits such as weed control,” he says.

To calculate a measurement, David took samples at depth, measuring soil carbon

and bulk density at four ranges — 0-15cm, 15-30cm, 30-60cm and 60-90cm. David says this is because the deeper within the soil profile, the more the carbon stock declines.

For each depth, he compared a series of cover crop treatments overlaid with either no-till or subsoiling with a Kverneland DTX.

The most notable results were found at 15-30cm depth, where no-till/cover crop treatments significantly increased soil carbon stocks. According to David, this depth is where most roots are found, explaining why the results were less significant at other depths.

Overall, the work shows that at 15-30cm, cover crops increase carbon stocks from 36t/ha



David Purdy's research shows that at a 15-30cm depth, cover crops increase carbon stocks from 36t/ha to 44t/ha.

to 44t/ha, equating to a cover crop draw-down of 27t/ha CO₂e. As for subsoiling, David's research shows it releases 17t/ha CO₂e when measured at the shallower depth of 0-15cm.

Further learning



Tine drills offer subtle loosening to help establish a cover crop without causing deeper damage, says Philip Wright.

A regular speaker at the Lamport open days is independent soil and cultivations expert, Philip Wright, whose knowledge lies in the synergies between roots and metal as part of a 'strategic tillage' approach.

He explains that it's important to identify and remove barriers to effective root growth to enable their

natural structuring capacity. At Lamport, this has meant loosening the soil at 15cm to enable cover crop roots to do their job.

"In a silty-clay-loam scenario such as here at Lamport, the soils tend to slump and run together which can prove challenging to manage. Tine drills offer subtle loosening to help establish the cover crop without causing deeper damage," he says.

"It all depends on the soil type and understanding how little you need to do and exactly where, to achieve results. You don't have to subsoil, it's about subtle restructures."

To that end, Philip believes problems incurred as a result of no-till such as weed burden, compaction and runoff can be rectified by occasional strategic tillage, aka ST.

For those more interested in nutrition, Agrovista's soil expert, Chris Martin, shared insight on alternatives to bagged fertiliser including a potential new stack.

He says a different approach is necessary to maintain healthy soil biology. This is because industrial farming through excessive cultivations and increased reliance on nitrate fertilisers has created bacterial-dominated soils. "This favours early succession plants such as bromes and blackgrass, whereas the crops we're trying to grow such as cereals, prefer a more even fungi:bacteria ratio," says Chris.

In nitrogen trials, the proposed stack includes nitrification inhibitor, Instinct; carbon-based microbe food, L-CBF Boost; foliar endophyte spray, Tarbis; and slow-release fertiliser, MZ28. To put the theory into action, a trial at Lamport investigated their efficacy when used alongside 130kg/ha of urea.

Chris says compared with 230kg/ha of ammonium nitrate, cost-wise, there was no difference and up until early June, the alternative stack looked greener. "It then ran out



Chris Martin has been investigating alternatives to bagged fertiliser including a potential new stack.

of steam and tissue testing suggests we did undercook it. This isn't surprising in a relatively low biologically active soil such as Lamport. Had we applied about 160kgN/ha at the start, I think it'd been about right," he says.

According to Chris, a change in perspective is required as to what's regarded as a 'healthy' crop. "Does it need to be so lush and dark green to be delivering a solid crop? Plus the trial's shown we've managed to reduce blackgrass along the way."

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