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IN FIELD FOCUS

AGRONOMY THAT DELIVERS

LINING UP FOR EARLY DRILLING?

Drilling early ensures the crop is in the ground before winter, admits ProCam regional technical manager for southern England, Paul Gruber.

But it also puts crops at greater risk from several yield-robbing problems – not least blackgrass, barley yellow dwarf virus (BYDV), Septoria and lodging.

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PROCAM

Lining up for early drilling?

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Indeed ProCam 4Cast, the annual big data analysis of thousands of hectares, has shown average spend on herbicides and fungicides was higher in earlier drilling seasons, such as 2011/12, than in later drilling seasons like 2012/13 (see panel).

"Don't automatically rush in to early drilling," advises Paul. "You need to take a step back and be aware of the downsides as well as the upsides. Otherwise, the potential yield gains from earlier drilling may be lost if you end up spending extra money keeping on top of weed, pest and disease problems. You have to think longer term."

Paul sets out some of the issues to be aware of in early-drilled crops:

Grass weeds

Anybody with blackgrass knows it thrives in early-drilling situations. But ryegrass, which has an even wider germination window, is also made much worse by planting crops sooner, as too are brome species.

Early drilling may be tempting this season after last year's crops struggled to establish, but it is important to be aware of the risks

"Delaying drilling helps against all three weeds by allowing more of the overall population to be controlled in stale seedbeds before planting," explains Paul.

"However, another benefit of later drilling is the better control you can get from residual herbicides. This is because soils should be cooler, so soil-acting herbicides should break down more slowly, providing a longer period of activity. Additionally, soils should contain more moisture, so provided there isn't leaching, herbicide uptake by weeds should also be increased.

Delaying drilling by a week may make the difference between exacerbating a blackgrass problem or achieving the magical 97% control figure needed for populations to stand still."

With sterile brome rising up the ranks of problem UK weeds, delaying drilling could also be particularly important if seeing this weed more often, says Paul, especially since there is increased brome tolerance to certain herbicides.

"Ultimately, if grass weeds are a problem, the message is don't undo any progress you've made reducing their populations over recent seasons by drilling too early this year.

"Even if your only grass weed is annual meadow-grass, if you drill early, this too could become more problematic. So you may want to add a residual herbicide into the programme, to better keep it in check."

Be prepared to put extra effort and investment into managing a wide range of agronomic challenges if drilling earlier, says Paul Gruber

BYDV

Even if you are not in a blackgrass area, chances are you are still at risk of BYDV. So if you do drill early, you could be relying on increased aphicide spraying (see BYDV article on page 6 for more information).

Diseases

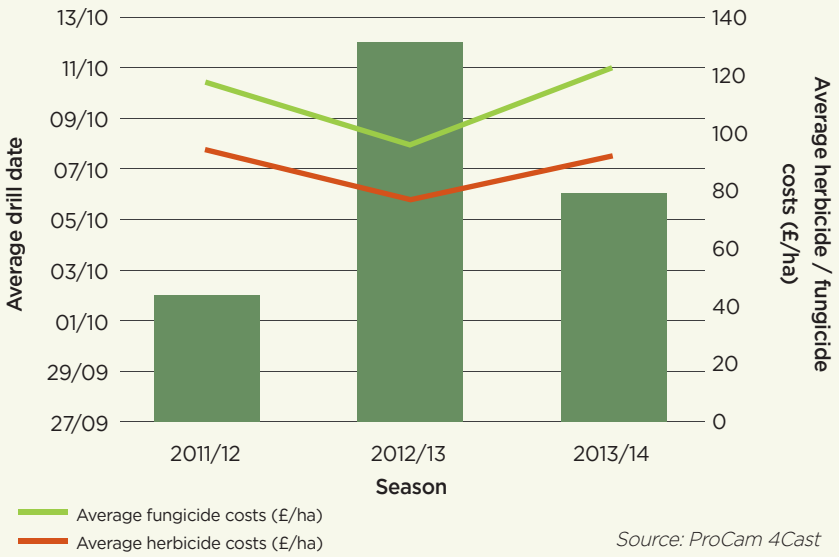
Several foliar, root and stem base diseases can be exacerbated by early drilling, so good variety resistance and fungicides with appropriate activity will also be crucial if going down the early drilling route.

Paul says: "Septoria risk definitely increases with earlier drilling, because the disease has more time to build up over winter. Similarly, take-all is a greater risk.

"Because take-all is on the roots of the first cereal, drilling

‘Big data’ highlights added early drilling costs

Impact of earlier drilling seasons (2011/12 and 2013/14) on input spend



Source: ProCam 4Cast

Analysis of ProCam 4Cast data has clearly highlighted increased herbicide and fungicide costs in earlier drilling seasons.

Compared with 2012/13, when average winter wheat drilling date was 12 October, drilling 10 days earlier in 2011/12 correlated with average herbicide and fungicide spends being around £15-20/ha higher.

Similarly, drilling six days earlier than 2012/13, in 2013/14, correlated with average herbicide spend being around £15-20/ha higher and average fungicide spend being over £30/ha more.

In this analysis, it was concluded that the later drilling season of 2012/13 achieved better efficacy from grass weed herbicides and allowed more time for stale seedbeds before drilling. With earlier sowings, more expensive herbicide ‘stacks’ were needed to compensate for lower efficacy from pre-emergence herbicides applied in less than ideal conditions.

Earlier-sown crops are also more disease-prone, likely requiring more expensive fungicide programmes. In 2013/14 this was exacerbated by a mild winter and an aggressive outbreak of yellow rust.

Trial plots have shown that even a highly resistant variety can still be infected with Septoria if drilled early

soon after harvest means more opportunity for it to transfer to the roots of the second cereal. That said, second wheat drilled later into colder and wetter soils can also be at risk, because it has poorer roots to begin with. Virtually whenever you drill second wheat, it is likely to benefit from a take-all seed treatment,” he adds.

Among other diseases, eyespot is also generally an early-drilled problem, says Paul, though it also needs watching on later-drilled wheat following maize.

Similarly, yellow rust risk can also increase with earlier drilling, although the biggest impact is the weather over winter and into spring, which explains why later-drilled crops can also be affected, as in 2019/20.

“Mildew can also increase with earlier drilling, due to crops growing thicker. But stress can also be a trigger, for example due to poorer rooting, which is why some very early-drilled crops can be less susceptible because they tend to have better roots.”

Lodging

Lodging risk very much increases with early drilling, says Paul. “Quite simply, canopies develop more tillers, so can become overcrowded leading to stem weakness, and stems grow taller, so there is also more leverage force acting on them to topple them over.”

Considerations

Still thinking of drilling early? Then be prepared to put extra effort into managing these problems.

Paul says: “Certainly you need to be looking at varieties with good lodging resistance. And good Septoria resistance is crucial, and potentially good resistance to other diseases, including eyespot. Some winter wheat varieties have better eyespot tolerance, due to the Rendezvous resistance gene.

“Put simply, you cannot afford to choose any kind of susceptible variety if drilling early. Varieties have become available recently with improved Septoria tritici resistance. But even if you do grow a more resistant variety, you still can’t rely on this totally (see trials results article on pages 4 and 5). You also have to be prepared for increased spend on fungicides, as well as on plant growth regulators (PGRs), BYDV sprays and herbicides.

“As an example, fungicides with good eyespot activity, such as prothioconazole, are essential to include in programmes if eyespot is a problem.

“However, there are some crossover benefits from certain inputs. Early use of trinexapac-containing PGRs, for example, which makes straw thicker when applied correctly, can also help to reduce eyespot penetration through the stem.”

Want to know more?

Search ProCam UK on YouTube to see videos of our Cawood trials.

Teachings from trials

Trials open days may have been thin on the ground this summer. But ProCam research has continued, and revealed some topical insights.

The Stockbridge Technology Centre, Cawood, near York, is a central research hub for ProCam, hosting glasshouse testing and around 600 trial plots, and linking with other ProCam trials around the UK.

But while there wasn't a ProCam Cawood open day this season, there were nevertheless topical results.

"We are putting increasing focus into quality trials that address the real-world issues farmers face," explains ProCam regional technical manager for northern England, Nigel Scott.

NEW WINTER WHEAT VARIETIES

A key part of ProCam's Cawood work focuses on cereal varieties.

Typically, new varieties are introduced into rotations to improve margins, says seed manager, Lee Harker, but margin isn't only about yield.

"With increasing challenges from certain weeds, pests and diseases, you also have to think how a new variety can help address these," explains Lee. "For example, whether a new variety fits your drilling window for tackling blackgrass or BYDV, whether it is resilient to your main disease risks, and how resistant it is to lodging, especially if drilling early.

"Our trials help because we don't just assess yield. We road-test varieties at different drilling dates, and when using realistic levels of fungicide.

"We have examined the four new Group 4 winter feed wheats added to the AHDB Recommended List for 2020/21."

RGT Saki

Reviewing Saki, the only soft wheat of the four, Lee says it is high-yielding, second only to LG Skyscraper in the Group 4 soft feeds for UK treated yield, and has good all-round disease resistance.

"It was also one of the few varieties not showing yellow rust in our Cawood trial this year," says Lee, "though clearly we should never be complacent with yellow rust. It is also stiff-strawed, and well-suited as a first or second wheat. It may be a bit late-maturing for the north, but it has looked good in the field."

SY Insitor

Turning to the three new hard winter wheats, Lee says the first of these, SY Insitor, has gone straight to the top of the hard Group 4 list in terms of its UK treated yield figure, at 105%, and has a high specific weight of 78.3 kg/hl.

"It also has good all-round disease resistance, though yellow rust and particularly brown rust need watching, and it looks suited to lighter and heavier soils.

"SY Insitor also looks good for later drilling, so could be a serious contender if concerned about blackgrass or BYDV. A slight question mark could be standing ability, but it responds well to a PGR programme," he notes.

KWS Kinetic

Another high-yielding hard Group 4, with a treated yield of 104%, a high specific weight of 78.5 kg/hl, and short, stiff straw is KWS Kinetic, says Lee.

"It also looks suited to all soil types, but probably isn't one for drilling in September. Septoria needs watching with a resistance rating of 5.0. Yellow rust has also been very visible in the Cawood trials and this may limit the variety's appeal."

Theodore

Theodore is on the AHDB Recommended List with a recommendation for the west, but has the lowest UK treated yield and the lowest specific weight of the four new varieties, says Lee, and doesn't have orange wheat blossom midge resistance.

However, it has a high untreated yield and strong all-round disease resistance, including 8.2 against Septoria tritici, he says. "It may find a niche on mixed farms where growers have limited fungicide management time due to livestock workloads," Lee suggests.

Want to know more?
Search ProCam UK on YouTube to see videos of our Cawood trials.

DRILLING DATES

With drilling date impacting on many aspects of cereals, it makes sense for ProCam to examine how varieties respond to different drilling dates at Cawood, says trials officer, Jodie Littleford.

"We drill a range of winter wheat varieties at monthly intervals from September to January at increasing seed rates," Jodie explains.

"Despite all seed being treated, results in 2019/20 showed big differences between levels of emergence. For September, the best emergence was with Saki with 78%, while in December it was with Spotlight, which still maintained 72% emergence. So the same variety doesn't consistently give the best emergence. The lowest emergence of all varieties drilled in December was just 48%.

"By mid-March, typical tiller numbers from September drilling were 700-900 per metre squared. But from early January drilling, most were down at just 400-600, except Spotlight which maintained 700. So again, drilling date affects tillering of varieties differently.

"We've also examined how later drilling affects T1 to T2 fungicide intervals," adds Jodie. "Some varieties remain consistent whereas others show a trend to shorter intervals with later drilling."

This knowledge helps us to time fungicides more accurately on varieties, says Nigel Scott, maximising the chance of applying them preventatively, when they give the best results.

"We've also seen that even a variety with very high Septoria tritici resistance can still become infected if drilled in September," Nigel says.

"For yellow rust, all varieties in the trial were rated 7-9 for resistance. Yet there were still differences in levels of the disease. Some varieties stayed clean – even when untreated – but others became infected across all drilling dates. This highlights that you cannot rely purely on variety resistance."

BIO-STIMULANTS AND MICRONUTRIENTS

As interest grows in using bio-stimulants and micronutrients to improve crop health, ProCam continues to build its knowledge of these products.

"We evaluate them in three stages," Nigel explains, "starting by screening them in glasshouse pot tests. Those that pass pot tests are put into field trials. Finally, those that work in trials are put into field-scale comparisons on-farm.

"In the glasshouse, we have seen major improvements in root mass from early application, so there's an argument in some situations for considering autumn application.

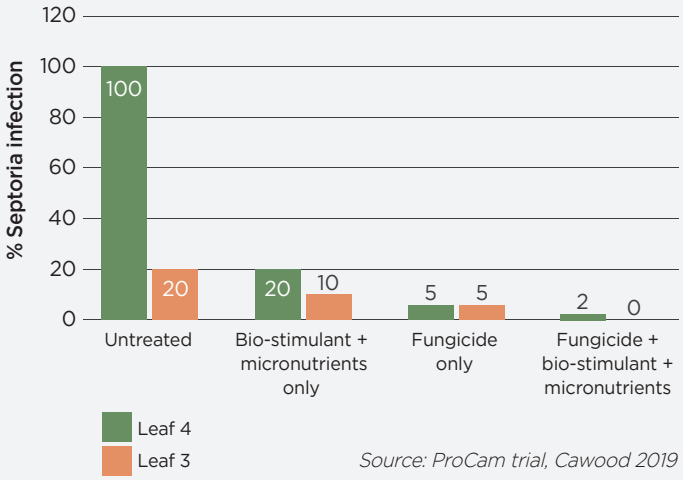
"In addition, with factors such as the loss of crop protection active ingredients and resistance, there's an increasing argument for boosting crop health in the spring with these treatments, and we have seen visible reductions in disease."

Pointing to examples, Nigel says plots at Cawood in 2019 showed Septoria on leaf 3 was halved from 20% to 10% with a bio-stimulant + nutrition programme compared with untreated, and a combined fungicide plus bio-stimulant + nutrition programme reduced leaf 3 infection to zero.

"In field situations, we suggest combining spring applications of these treatments with the fungicide programme. Two out of three seasons of Cawood trials have shown substantial yield gains from doing this. And we've seen an extra 0.5-0.6 t/ha in field-scale farm comparisons over consecutive years."

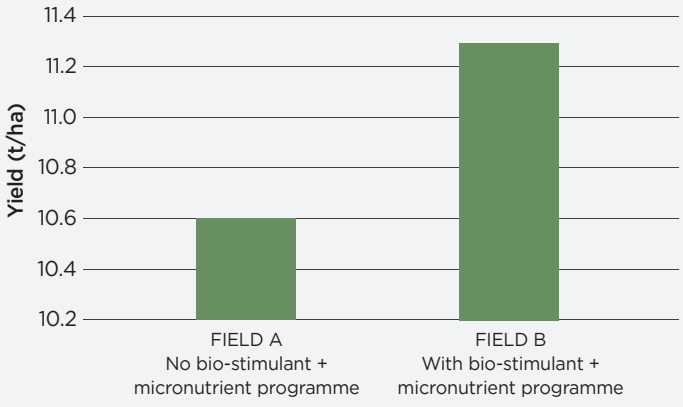
Glasshouse screening has revealed visible improvements in root mass from early bio-stimulant + micronutrient application (left)

Reduced Septoria levels in winter wheat following different treatments



Source: ProCam trial, Cawood 2019

Example yield improvement from bio-stimulant + micronutrient programme on farm



Source: Farm comparison, 2016

While delaying drilling is a key strategy for reducing BYDV risks, it is important to balance it with your ability to travel on the land to apply inputs afterwards, including aphicide sprays against BYDV

Battling with BYDV

Many growers got away lightly with barley yellow dwarf virus in 2019/20, after enforced delayed drilling. But the problem hasn't gone away.

There's no single alternative control method to the loss of a neonicotinoid seed treatment against aphid vectors of BYDV, says ProCam head of crop production, Mike Thornton. So growers have to adopt a multifaceted approach.

"Wherever it is possible, delaying drilling not only means fewer aphids will be around to spread the virus," says Mike, "it also allows extended windows to kill off green bridges in stubbles where aphids survive between crops.

"Clearly, delayed drilling is easier in the south than further north. But wherever you are, don't rule it out.

"Start by assessing how far drilling date can realistically be pushed back. As well as your location, consider your soil type and the ability to travel on your land later – including to apply aphicide sprays.

"That said, where you do drill later, always ensure you compensate for the reduction in plant emergence and tillering that occurs as seed goes into colder, wetter soils. Begin by choosing winter wheat varieties that perform well with later drilling, and increase seed rates accordingly. Additionally, check the variety's maturity, because later drilling is likely to push back harvest date, which could impact on following crops."

Another important step when drilling later is to create a good seedbed, says Mike, to give crop establishment the best possible start.

"Similarly, guard against increased risks of plant loss from seedling diseases with a fungicide seed treatment. And remember the benefits of bio-stimulants and micronutrients for giving later-drilled crops an added boost.

"Research we commissioned at the University of Nottingham on wheat showed that applying a bio-stimulant at GS12 boosted average root weight by a third just 24 days later. The right bio-stimulant products can be tank-mixed with aphicide sprays, avoiding the need for an extra spray pass."

With aphicides, Mike says these should be applied according to risk and with resistance management firmly in mind. Online tools that predict aphid emergence based on temperature provide an indicator of risk build-up in a given area. However, crops still need assessing on a field-by-field basis, he stresses, because temperatures can vary over short distances – such as north versus south-facing slopes.

"Pyrethroid sprays have only short persistence, so spray timing is critical. Earlier drilling is likely to require additional sprays for each new generation of aphids that appears. As an example, up to four sprays may be needed for a crop on the south coast emerging on 1 October, compared with three sprays for a later-drilled crop emerging on 21 October.

For longer-term BYDV management, avoid rotations with continuous cereals, says Mike Thornton, as these encourage aphid numbers

"For longer-term BYDV management, avoid rotations with continuous cereals, as these encourage aphid numbers."

Although delaying drilling helps against BYDV, slower-emerging cereals can be more vulnerable to slug damage, says Mike, so you have to identify which poses your biggest risk.

Prospects for oilseed rape crops

With UK rapeseed production from the 2020 harvest potentially at its lowest level for fifteen years, ProCam agronomists share their views on the crop's future.

There's no doubting that confidence is at a low ebb for growing oilseed rape.

And yet, as many will testify, there's little to rival it as a break crop, and – even without barn-busting performance – OSR can still offer one of the best margins.

Spot decisions

Gary Webster, an agronomist with Fieldcare North in Yorkshire, has witnessed massive reductions in the OSR acreage in his area since the neonicotinoids ban. Going forward, he's seeing more and more farmers making late decisions based on drilling conditions, as successful establishment is such a critical factor.

"More growers are thinking on their feet and only drilling winter OSR if there's sufficient moisture," he says. "That's understandable, given the importance of getting the crop away early and the problems with flea beetle.

"It's frustrating, because winter OSR offers the best potential gross margin and will usually mean an excellent first wheat to follow. Alternative break crops such as spring beans or linseed simply don't offer the same returns.

"There's a strong case for staying patient and being ready to go when conditions do come right, such are the advantages of it in the rotation."

Changing tactics

Phil Edwards, an agronomist from The Arable Centre operating in Wiltshire and Dorset, has seen his acreage of winter OSR reduce by around three quarters in the last three years. The decline is again a direct result of the challenges controlling flea beetle, which he says is an evolving problem.

"I've seen crops survive an adult flea beetle attack in the autumn and then succumb to a larval attack the following spring," he says, "so there are no easy answers currently."

With the lack of viable alternative break crops, Phil believes determination may well be the best option and says breaking away from established practices may offer solutions.

"We may need to explore strategies such as increased seeding rates with a range of seeding depths, staggering the germination window and therefore giving the crop a better chance of success. At seed rates of 7–10kg/ha, we'd need the industry to be offering cheaper seed, but that may prove to be the best way forward."

Seeking a premium

In north eastern Scotland, where Simon Jackson carries out agronomy for Robertson Crop Services, flea beetle is relatively rare, but there's still been a drop-off in the winter OSR rape acreage, more due to economics.

Those sticking with the crop are doing so for the wider rotational benefits. Achieving early establishment by growing it after winter barley is a key factor.

With premium prices critical to crop profitability, Simon says the benefits that Clearfield varieties offer – allowing more effective control of volunteers to ensure a 100% clean sample – can be significant.

Break crop benefits

Flea beetle is also less of an issue for Ollie Berkeley, who covers Kent, Surrey and Sussex for Rutherfords. Despite other challenges, including grass weeds and volunteers, most farmers are sticking with the crop, because it offers one of the best margins and is unrivalled as a break crop.

He says around two-thirds of those growing the crop are choosing to grow Clearfield hybrids, for the agronomic advantages they offer.

Market prices for oilseed are driven by complex global factors, not least currency fluctuations and the worldwide oil price. Growers should therefore not correlate a fall in the UK acreage with a likely price increase, but the bigger picture of OSR's rotational benefits should not be forgotten.

SOIL HEALTH FOCUS

With soil health rising on the political agenda and likely to be an integral part of future farm support policy, we look at two farmers who already have a clear focus on the asset under their feet.

Livestock aids tillage transition

Running a fully mixed farming operation with his family, Buckinghamshire farmer Steve Lear has found it easier than many out-and-out arable farms to transition from conventional cultivations to direct drilling.

Years of applying manure from his 400-head pedigree Limousin suckler herd has kept his soils in relatively good health, so - when he put the plough and power harrow away four years ago - the pain of conversion never really came.

On the contrary, he's maintained yields in his arable crops, reduced fixed and variable costs, and established some level of control over the blackgrass infestation that partly prompted this personal farming revolution in the first place.

"Blackgrass was certainly a factor in our decision to change, but so was the desire to stop spending a fortune burning diesel trying to establish seedbeds in our very heavy soils," says Steve. "We were sometimes following the plough with as many as three passes with a power harrow before drilling, using over 80 litres/ha, so something had to change.

"Of course, it's been a process of education, but since we moved to direct drilling, we've cut our diesel consumption for cultivations to between 6 and 12 litres/ha and significantly reduced the time spent on it. We're using the time saved for more productive work, catching up on the jobs that we would previously not have got around to.

"Working with our ProCam agronomist Paul Gruber throughout has been important. He has the technical expertise and wider knowledge that helps us to understand where we can cut back inputs and where we can't."

The transition at 1,000ha Creslow Manor, near Aylesbury, has involved some significant changes in the cropping, with a greater proportion of spring crops being grown, more grassland in the arable rotation and an important role for cover crops.

"We were moving towards more spring cropping before introducing direct drilling, as a means of combatting the blackgrass problem," adds Steve, "and we've continued to evolve the rotation over the past four years.

"Cover crops contribute greatly to soil health, acting as a form of cultivation through their rooting activity and building organic matter. All of our spring crops are now preceded by a cover crop, and we can often establish a short term cover crop before winter wheat when following a wholecrop cereal."

Steve uses a variety of cover

Direct drilling at Creslow Manor with cattle in situ

Cover crop seeds mixtures used at Creslow Manor include a diverse range of species

crops, ranging from a relatively simple winter oats and mustard formulation to very diverse mixtures containing cereals, herbs and legumes. With cover crops usually going in after wholecrop cereals and winter barley, around a quarter of the 600ha arable rotation is typically being managed in this way at any one time.

"We like the more diverse mixtures because the varying plant types are making different contributions, in terms of rooting depth and the recycling of nutrients," says Steve. "The aim is always to graze off the cover crops with sheep, wherever possible, and then spray off the residue six weeks before we establish the following spring crop. It's important to deal with the aftermath in good time, as excessive crop residues can cause problems with establishment, not least shading the blackgrass from any contact sprays."

Direct drilling

The main drill in use at Creslow Manor is a 5 metre Cross Slot low-disturbance no-tillage machine. Incorporating a disc opener with auto-adjustable down force to suit a wide range of conditions, this drill offers Steve a good deal of versatility, and is fitted out to simultaneously handle two seed types and liquid fertiliser in a single pass. He also uses a Simtech Aitchison disc and tine drill for deeper drilling. This drill is also used to establish clover in grass leys as it leaves the slot slightly open, allowing in sunlight to stimulate germination.

In addition to their use with the cereals, spring beans and cover crops, the drills are also used to overseed grass into established grazing and cutting leys.

"We find this to be an effective way to renew our grassland leys," says Steve. "It's important to reduce the competition from the existing sward, so we ease back on the nitrogen and graze tightly before drilling and keep the stock on until the point where they would pull out the new seedlings. Renovating the leys in this way minimises soil disturbance and means we can avoid having land out of production for six to eight months."

The grassland, along with the livestock that it supports, plays a big part in the integrated farming system that Steve believes is a sustainable way forward.

"The livestock, the cover crops, even our hedgerows, all play a part in creating the diversity that we need to make the system work," he adds. "For example, we're seeing a build-up of beneficial insects, because we're creating the habitats and food sources they need, and as a result we've been able to virtually avoid the need for insecticides for the last three years.

"It's about finding the right balance of inputs, not simply cutting things out, and we keep learning ways to improve every year."

Grassland reseeding is often carried out by drilling into existing swards

Soil health solution

SOIL HEALTH FOCUS

Restoring soil health to large acreages of farmland will be integral to sustainable farming in the future.

That's the view of Rob and Jo Hodgkins, who have experienced first-hand the damage reeked over recent decades by modern large scale agricultural practices.

Both Nuffield Scholars and graduates of the Worshipful Company of Farmers' Advanced Business Management programme – and self-starters in farming – they are committed to a farming methodology that has soil health at its core. Their approach includes the integration of livestock back onto arable farms, with cover crops included in a rotation that can see as many as six profit-generating crops grown in a four year period.

"We believe there is a sustainable business model that can work for a great number of arable farms, particularly where significant areas are compromised by poor soil health or by issues such as blackgrass," says Rob. "However, it requires a real change of mindset and a fully committed approach to be successful.

"Through our own experiences, we've taken land with significant weed grass problems and poor soil structure – land that has been plundered for 20-25 years - and turned it around, making a decent return in the process."

Rob and Jo started with just 60 acres and 200 cull ewes back in 2013 and have now built their Kaiapoi farming enterprise that currently includes 1,600 arable acres and 1,000 acres of grassland in north Hertfordshire, all on Farm Business Tenancy agreements, and 2,500 New Zealand Romney ewes. They have developed a system with a four year arable rotation, alternating winter and spring crops to help combat the inherent blackgrass infestations. Cover crops are grown in between winter and spring crops, providing over-winter grazing for ewes and finishing lambs.

"We tend to follow a winter cereal with a cover crop mixture of 100kg/ha of winter oats and 5kg/ha of berseem clover, direct drilled into the stubble straight after the combine," says Rob. "The earlier establishment makes all the difference and creates a forage crop that ewes and fattening lambs are turned onto from September."

Field Options' Eco-Pasture legume and herb rich mix qualifies as a specialist GS4 mixture for Countryside Stewardship and delivers outstanding performance in terms of livestock output

Around 200ha of over-winter cover crop grazing is supplemented with an additional 80-90ha of stubble turnips grown on a neighbouring farm.

"We like the stubble turnips for what they provide in terms of winter fodder but we're in an area that suffers badly with flea beetle so find them very difficult to grow," adds Rob. "Our neighbour

Rob and Jo Hodgkins have been honing the New Zealand Romney into the ideal 'arable sheep' requiring low levels of inputs and minimal infrastructure

grows a lot of winter barley, which allows earlier drilling of the stubble turnips and this seems to make all the difference in terms of establishment."

The combination of cover crops and sheep make a valuable contribution to soil health and fertility. Using a leaf tissue nitrogen sensor, 35-50kgN/ha is known to be available for the following crop, in addition to the building of soil organic matter.

"We don't aim to graze the cover crops to the ground as we prefer to leave some crop residue on the surface," says Rob. "Overall, the cover crops offer great flexibility and create options.

"This year, for example, we've been able to establish winter wheat in January following the cover crop, effectively turning what would have been a spring crop into a winter crop. "That's potentially going to be really beneficial this year looking at the value of winter cereals."

Sheep genetics

Key to the success of the system is having the right sheep genetics. Rob recommends the New Zealand Romney, a breed that he rates due to its low maintenance characteristics, resistance to foot rot and its ability to be lambed outdoors with minimal trouble, achieving 170-180% lambing percentage.

He describes them as 'Arable Romneys', because they fit around the arable system, with lambing taking place in the early part of April when there's a window of opportunity between routine arable operations. Also, with cover crops costing as little as £30-£35/ha providing ample winter feed, there's no compulsion to sell lambs off the farm early, so instead the strategy is to make the most of what are typically better prices for finished lambs in January and February.

Quality grazing

Another key element of Rob and Jo's system are five-year herbal leys, grown as legume and herb rich pastures as part of a Countryside Stewardship Scheme. Within their 1,600 acre enterprise, around 300-400 acres will be down to herbal leys at any one time, these providing all the grazing from lambing time through to September when the sheep move onto the cover crops. Whilst there are some restrictions around what is grown and how the leys are managed, there are significant support payments – in excess of £300/ha – and additional grants available to fund infrastructure.

Specialist GS4 mixtures are supplied by Field Options and have been developed with maximum productivity as well as compliance as joint objectives. Testing is carried out at Field Options' trials site at Harper Adams University, where the best performing mixture, Eco-Pasture, produced 1.3 tonnes of dry matter per hectare more than Field Options' leading long term mixture. Put in terms of output potential, this equates to 1,300 extra grazing days or more than 300kg of additional liveweight per hectare.

"With the leys unstocked over the winter, we are lambing on covers of 1,700–2,000kgDM/ha, which allows us to keep the ewes and lambs tightly stocked and this minimises the risk of separation. I'm sure this helps to boost lamb survival rates and – with the quality of grazing available – they do well.

"We split fields into four or five areas with electric fencing, to rotationally graze, which maximises utilisation whilst also allowing us to comply with the requirement for a five week environmental rest period."

Model approach

With Rob and Jo's combined expertise, the Kaiapoi enterprise is developing into a sustainable and profitable business. It's an approach that they believe has merit in the wider arable farming industry and they have demonstrated this through a comprehensively costed model.

Taking a 1,400–1,600 acre arable unit as an example, they have shown how putting the least productive 300-400 acres into a Countryside Stewardship Scheme – and integrating cover crops into the remaining arable rotation - can create the platform for a 1,000 ewe enterprise.

"We recognise the importance of expertise and have costed in a full-time shepherd and also allowed for capital expenditure on vital equipment such as a handling system," says Rob. "By taking advantage of Countryside Stewardship, and ensuring you have the right breed of sheep to complement the system, this can be a profitable way forward.

"I think there are a lot of farms where the worst performing 15-20% of the arable acreage is generating minimal profit, due to issues such as poor soil health or weed grass infestations. Integrating livestock into the system in the way we're outlining may well be the best way to go."

Cover crops such as winter oats and berseem clover are drilled directly into stubble straight after harvesting winter cereals

The ProCam trial at Cawood, Yorks, is examining short and longer-term benefits of cover crops

Solutions from seeds

Including the right crop in rotations isn't only important for output. It can help with agronomic challenges. ***In Field Focus*** looks at examples.

Hybrid barley

Hybrid barley is a great example of a crop that can benefit rotations, says ProCam regional technical manager in the south, Paul Gruber. Not only is it high-yielding, it is also known for its vigorous growth helping to suppress blackgrass.

"If you're looking for an early entry into winter oilseed rape, hybrid barley is also an excellent alternative to winter wheat or spring barley," says Paul, "both of which can be in the ground for four weeks longer.

"Hybrid barley is also a useful option for planting after spring barley. This is a slot where winter wheat can struggle, but where winter barley's earlier maturity means it is further through grain-filling before take-all inflicts too much root damage."

ProCam trials have also shown hybrid barley to be more resilient to slightly later drilling than conventional winter barley, says Paul. Trial plots at Cawood showed up to 20% better establishment in the hybrid, Libra, than in conventional barley over a range of drilling dates, despite sowing only around half as many seeds.

"The quality of today's hybrid barleys has also improved massively. Libra's specific weight figure, for instance, is higher than all bar one of the conventional two-row winter barleys on the 2020/21 AHDB Recommended List."

Cover crops

Cover crops are attracting increased interest for several reasons, but there remains a lot to learn about them. So Field Options has adopted a science-led approach to unravelling their secrets in a multi-season trial.

This is assessing two sowing dates – spring and summer – for 12 straight cover crop species and five species mixtures.

Plots are being evaluated both with and without nitrogen fertiliser – to gauge the benefits of the different cover crops and fertiliser regimes on ground cover and weed suppression, and on levels of biomass for providing green material to improve soil health.

Once the cover crops have been destroyed, the area is being planted with winter wheat, to determine the longer-term benefits of each cover crop on the following crop.

Miscanthus

Miscanthus is a crop that could have a bigger role in rotations under future Environmental Land Management (ELMS) conditions. Alongside strong carbon sequestration credentials and significant ecological benefits, miscanthus offers the potential of a very stable margin over long contract periods when grown for biofuel. It could be an option on more marginal land or as a buffer zone against sensitive areas such as water courses.

As with most crops, the establishment phase is the critical period, which in the case of miscanthus involves the planting of rhizomatous root stock. Weed control is important at this stage but thereafter management of the crop is relatively straightforward.

ProCam is now the agronomy partner with miscanthus specialist Terravesta, who are committed to developing the crop through plant breeding and the exploration of new markets.

Want to know more?

Search ProCam UK on YouTube to see videos of our Cawood trials.

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