

# IN FIELD FOCUS

— AGRONOMY THAT DELIVERS —

## READY TO WRESTLE WITH EARLY AND LATE WHEAT?

Be prepared for the unexpected with winter wheat crops this spring after the mixed bag of drilling dates.

That is the message from ProCam regional technical manager, Matt Cobbald.

This isn't necessarily negative, he stresses, and being forewarned will help you make the most of some potentially decent grain prices.

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**Digesting changes** | **Maximising maize** | **Responding to rust**



**PROCAM**



## Spring sprays against BYDV?

With difficulties travelling on the land to spray on many farms last autumn, is it worth treating winter cereals against barley yellow dwarf virus (BYDV) in spring?

That's a question many farmers are asking, says ProCam head of crop production, Mike Thornton, particularly in 'risky' parts of the country, and given that some crops were drilled early.

"BYDV levels will be impacted by the extent to which aphids have been killed off over winter," says Mike. "Mild weather increases aphid survival, and we've had some mild conditions.

"The other thing to bear in mind is that many winter wheat crops were drilled extremely late during the previous 2019/20 season. This kept aphid levels relatively low, and to some extent masked the fact that crops hadn't received neonicotinoid protection. This season could

therefore provide us with the first true indication of how exposed to BYDV infection crops are without this," he adds.

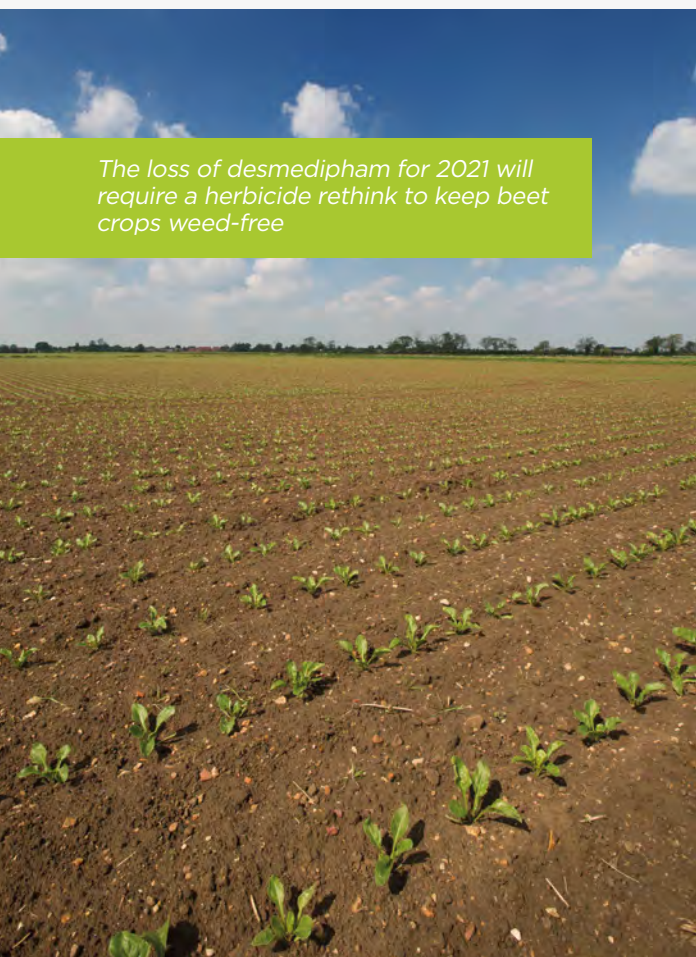
Overall, Mike says the best guidance is to assess BYDV risk at an individual field level rather than using a blanket approach, taking into account factors such as drilling date and accumulated temperatures, as well as visible aphid numbers.

"It's possible to get an economic response from controlling problematic numbers of aphids up until GS30. However, we also have to be aware of the dangers of over-using foliar aphicides in those fields that have already been sprayed earlier in the season, given that resistance is such a concern."



*This season could be the first true indication of how exposed to BYDV infection crops are without a neonicotinoid seed treatment, says Mike Thornton*

*The loss of desmedipham for 2021 will require a herbicide rethink to keep beet crops weed-free*



## Battling beet weeds without desmedipham

The loss of desmedipham is set to bring added challenges to sugar beet weed control. So what can be done?

"Desmedipham was a highly useful part of the herbicide mix," says Mike Thornton. "It was effective on larger weeds, as well as in cooler and drier conditions.

"These attributes provided very practical benefits – notably, where weeds were growing quicker than expected or where the weather had delayed spraying. Its loss from the herbicide armoury for 2021 will mean programmes are going to have to be adapted."

In response, Mike says application timings for remaining post-emergence herbicide chemistry is going to have to be that much more accurate. He says this is likely to mean more regular and detailed crop monitoring to catch weeds while still small.

"The other thing we're going to have to look at is re-introducing or bolstering the pre-emergence component of herbicide programmes, so that post-ems have less of a challenge.

"The loss of desmedipham is also going to be felt in fodder beet, where its activity on larger weeds was also useful," Mike concludes.

# Resilience in challenging times

Our industry is often described as resilient, and that is a trait that has most certainly come to the fore over the past 12 months.



*Diane Heath, UK Managing Director, ProCam*

With the world in the grip of the coronavirus pandemic, farmers have ploughed on relentlessly, dealing with the usual seasonal challenges alongside this new threat, to continue putting food on the nation's table. Supported by the agricultural supply trade, food processors and the retail sector – and a great many others – the agricultural industry has stood tall. It's something we can all be proud of.

When life does eventually return to 'normal', the challenges and opportunities that modern farming faces will remain, and that resilience will continue to be tested.

In this issue of In Field Focus, we cover some of the issues that will be important throughout 2021 and beyond. We look at day-to-day agronomic realities, like the loss of important crop protection active ingredients and evolving disease resistance threats. By drawing on the experience of ProCam's nationwide team of 'boots-on-the-ground' agronomists, we offer sound advice and fresh perspectives on tackling the evolving threat of yellow rust. We look at maintaining crop performance

without key inputs such as desmedipham in sugar beet. And in the wake of another unpredictable autumn, we consider how best to cope with a mixed bag of drilling dates for winter cereals.

Within several of the articles, you'll see references to ProCam's industry leading work at the Stockbridge Technology Centre at Cawood in North Yorkshire, where we seek practical solutions to some of the more common challenges that farmers face.

## Starting a new era

Although other news kept it off the front pages, Brexit did happen at the end of last year and the UK has negotiated a trade deal with the EU. The deal has been broadly welcomed across our industry, not least because the threat of damaging tariffs and quotas has been removed at least for the foreseeable future, but exceptions such as the EU's ban on the export of UK certified seed will be of concern for some.

Perhaps more significant for the majority is the official end of the UK's participation in the CAP and the return to farm support policy at a national level. Whilst we still

await details, the direction of travel within the Environmental Land Management Scheme (ELMS) is quite clear; there will be less direct support and landowners will be expected to deliver 'public goods' in return for any future funding.

How farms adapt will be critical going forward and it's our privilege at ProCam to work with farm businesses that are already ahead of the curve. In this issue of In Field Focus, we share the experience at Oncoland in Kent, where a more holistic approach, with greater focus on soil health and crop nutrition, is creating a more efficient and sustainable business. Similarly, at Riding Farm in the northeast of England, we report on the incorporation of cover crops into a rotation and the impact that is having on soil health and sustainability. Over in the west, we hear how farmers are finding ways to maximise the value of their maize whilst enhancing the crop's environmental credentials. We're grateful to all the farms for agreeing to share their stories.

I hope you find our latest edition of In Field Focus to be a source of new ideas and inspiration, and that it helps you maintain the resilience that has served farming so well over the years.

**Diane Heath, UK Managing Director, ProCam**



*ProCam's industry leading research continues at the Stockbridge Technology Centre in North Yorkshire*



# Ready to wrestle with early and late wheat?

Continued from page 1

“Winter wheat drillings fell into three main categories this season,” says regional technical manager, Matt Cobbald.

“There were fields drilled early, during the dry window in September. Fields where growers managed to chip away at drilling around mid-October. And fields drilled when soils eventually became drier in November.

“These varied drilling dates mean we’re set to see crops at several stages of development as we move through spring. This in itself isn’t unusual. But what is unusual this season is that, in some regions, we’ve seen this spread of drilling dates on the same farm.”

This is significant because drilling date not only affects crop development, says Matt, it also impacts on the development of certain diseases, as well as on

canopy size and therefore lodging risk.

Added to this, he says, the combination of varieties with different speeds of development sown at different drilling dates could throw up further surprises with growth stages.

“All these factors are set to make regular crop monitoring crucial. But it’s certainly not bad news.

“Crop potential in many fields looks promising and there are good grain prices. And an upside of having a spread of growth stages across the farm is it helps to spread workloads.”

## Growth stages

With timely spraying so important for maintaining control of problems such as Septoria and yellow rust, Matt says it is important to be aware of any growth stage situations that might catch you out.

“One such situation is if you’ve sown a fast-developing variety early. Extase is an example of a variety

that develops quickly. And because of its good Septoria tritici resistance, it’s often planted in that early slot. This combination could put it well ahead of other varieties, such as October-drilled Graham. So it will be important to take this into account.

“The other thing to be aware of is extended intervals between T0, T1 and T2 in early-developing crop situations, which puts added pressure on maintaining persistent fungicide protection,” he notes.

## Disease management

A key point to remember with disease management is yellow rust doesn’t care whether winter wheat has been drilled late or early, says Matt, so don’t assume any crop is safe.

“Few varieties also have juvenile plant resistance to yellow rust. This means it can establish early even in a variety that, on paper, looks like it has a good resistance rating. This can catch people out. This season, some fields were already showing yellow rust before Christmas.

“In addition, watch out for Septoria, especially if it’s a wet and warm April, and especially in the West. Later drilling may reduce

## Drilling date trials

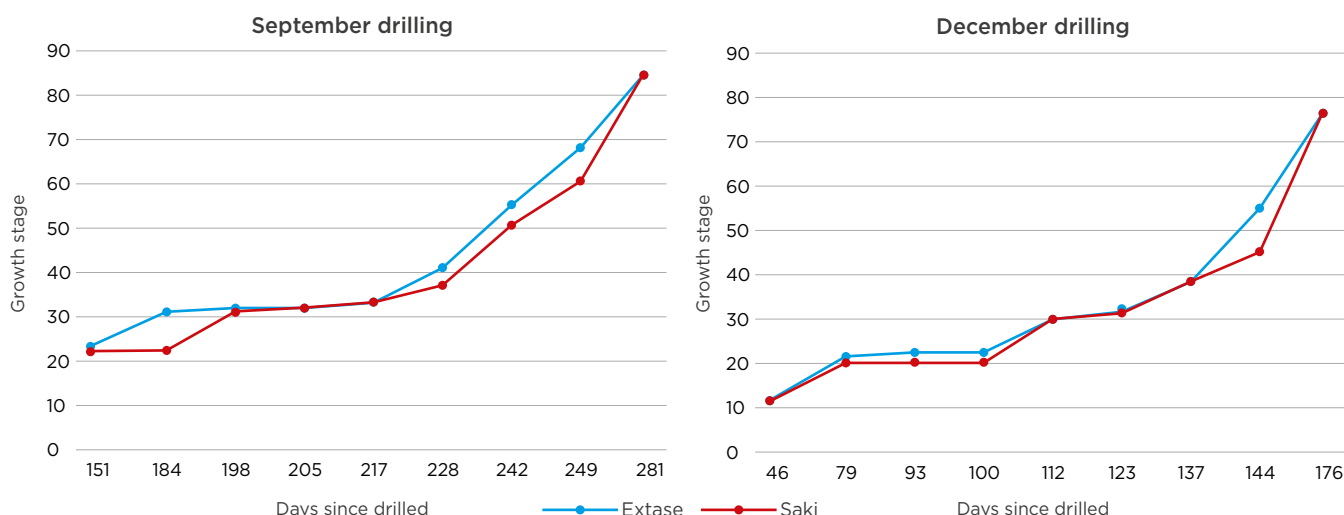
Results from ProCam’s trials hub at the Stockbridge Technology Centre, Cawood, North Yorkshire, have highlighted just how complex the interactions can be between drilling date and a variety’s speed of development, and therefore the importance of regular growth stage monitoring.

Results from 2020 showed that while fast-developing Extase was ahead of slower-developing

Saki for the first and second halves of the season when drilled in September or December, at each of these drilling dates, they both reached GS31 at the same time.

Trial plots in 2020 also confirmed something seen on a wider, field scale in ProCam 4Cast – namely that later-drilled winter wheat can yield just as well as an earlier-drilled crop.

### Comparisons of development of faster and slower-developing varieties



Septoria pressure, but look at fields on a case-by-case basis, and don't look at a fungicide programme as being cheap or expensive; look at it as being appropriate."

ProCam trials at Cawood last year showed that even a variety with high Septoria tritici resistance can harbour the disease over winter if drilled in September, Matt notes.

## Canopy management

With backward crops, be prepared to manage them for nitrogen early to ensure there are sufficient tiller numbers, says Matt. "For variable crops, be prepared to look after backward parts of the field.

"The other aspect to watch with a wide range of drilling dates plus faster and slower developing varieties is tailored plant growth regulator programmes.

"As well as a variety's inherent lodging risk, large canopies will exacerbate lodging potential. And if crops have sat in waterlogged soils, their roots may be stunted. A dry February and early March may help rooting, but nutrition also plays an important part."



*The combination of varieties with different speeds of development sown at different drilling dates could throw up some surprises with crop growth stages, says Matt Cobbald*

## Scottish lessons

With Scotland also effectively facing two winter wheat crops this season – those drilled in September and those that couldn't be planted until October – these, too, could require different management approaches, says Alistair Gordon, Scotland's regional technical manager for ProCam.

"About 80% of the winter wheat up here went in during good conditions in September," says Alistair. "But about 10% of the normal wheat area went in

during poor conditions in October and 10% didn't go in at all.

"Those winter wheat crops that went in late will need early nitrogen to help them recover, and possibly trace elements and bio-stimulants. If the crop starts growing before nitrogen has gone on there's a risk it will abort tillers. However, the soil needs to be 6 degrees C before the crop will start to grow."

Even if crops went in late, Alistair says it is important not to jump to the conclusion that they only justify minimal disease control. "Often, later-drilled crops still have decent yield potential. Variety is usually a bigger determinant of justifiable fungicide spend than drilling date. You can't allow disease to take hold.

"A TO fungicide is often still important, but this is the last year that mancozeb can be used, which means we'll be losing another important multi-site protectant. Mancozeb also supplies manganese, copper and zinc. Without it, we will have to look at other ways of supplying these micronutrients," he adds.

"With early-drilled wheats and barleys, a hidden risk is that heavy winter rain will have washed away soil nutrients, and crops sat in waterlogged soils are likely to have poorer roots. These are important to be mindful of, to ensure they don't hold crop potential back."

Where crops were drilled in September, Alistair says these will need monitoring early for mildew and Septoria, and thick, forward crops will need assessing for lodging risk.

He says: "A lot of wheat has also been planted after spring barley this season. This will effectively be a second wheat because barley isn't a break crop, so take-all may need managing, particularly if drilled early. Early nitrogen may be needed and the fungicide azoxystrobin also helps reduce take-all.

"The other thing to watch is timings of inputs in earlier and later-drilled winter cereals. Check crop growth accurately; don't just go on calendar date. Crops could be a month apart in growth stage during spring."



*A lot of wheat has been planted after spring barley this season, says Alistair Gordon, but barley isn't a break crop, so take-all may well need managing*



# Digesting changes for a greener farm

The decision to install an anaerobic digestion plant has been a catalyst for wide-ranging changes for one Kent farming business.

The last couple of seasons have seen some major rethinking on the 1,500ha mixed farming enterprise of Oncoland Limited, south west of Dartford.

Coinciding with the installation of a new anaerobic digestion (AD) plant, which began operating in October 2019, a whole series of joined-up cropping and agronomy changes have been introduced.

They are all part of a programme to boost the viability of the business by diversifying into producing gas for 'green' energy while also farming more efficiently – using digestate from the AD plant to improve soil health and crop nutrition.

"We originally installed the AD plant to future-proof the business," explains Justin Frankland, manager for the arable side of the farm, "but it's also been a catalyst for total change."

Along with 1,060ha of arable crops, including 400ha of Group 1 winter wheat, the business runs a 250-cow dairy unit, soon to increase to 450 cows, and rears some of its dairy cross youngstock to finish as beef.

## Forage feedstock

Forage maize has been a long-standing feature of the rotation for the livestock. But because maize also now forms the bulk of the forage feedstock for the AD plant, its area has more than doubled

from 100 to 260ha. This is sufficient to meet 9,000 of the AD plant's annual 14,000 tonne requirement. Additional maize is bought-in to prevent the rotation being too heavily maize and wheat biased.

"Because 50% of the gas produced has to come from farm waste, we also use slurry and manure from the dairy and beef units in the AD plant, along with straw from the cattle bedding. Having been used as bedding, the

straw is already starting to break down, which makes it easier for the AD plant to handle," Justin explains.

Completing the cycle, digestate from the AD plant which is spread back on the land is already allowing purchased fertiliser use to be reduced.

"Digestate is 90% liquid, which is quite uniform and easy to spread," Justin continues. "We use a contractor with an umbilical system and 24-metre boom."

"Looking at its analysis, we could substitute all the artificial fertiliser if we applied the right amount of digestate. We used it on maize ground last season to replace some of our maize starter fertiliser, and we're using it to replace one or possibly two of our fertiliser applications on wheat."

"The remaining 10% of the digestate is solid. Although lower in



*We originally installed the AD plant to future-proof the business, says Justin Frankland, but it's also been a catalyst for change*





*The AD plant produces enough gas for 3,500 homes and businesses, while digestate from the plant applied to the land is already allowing reductions in fertiliser use*

nutrients, it's high in organic matter. Some of it is recycled back into the AD plant, but the rest we're planning to use to improve our poorer chalk soils."

### Wholecrop rye

As well as increasing the maize area, the business has also introduced wholecrop rye into the rotation for use in the digester – originally trying 40ha but doubling that for the 2021 harvest. "Rye is early-sown and early to harvest. This spreads workload, but it's also a good entry to rotational grass because the rye is harvested before it can shed seed, so it doesn't produce volunteers to compete with the young sward."

Also introduced into the rotation has been a stubble turnip/forage rape mix. Planted after the rye has been harvested in June, this provides a cover/catch crop that minimises bare soils, improves soil organic matter and structure, and provides grazing for a neighbour's sheep.

By also spreading liquid digestate on the rye stubble, no further nutrition was needed for the stubble turnip/forage rape crop, Justin points out.

"The sheep also benefit the land by providing manure, and we've also grazed sheep on cereal stubbles with volunteers in, which helps us reduce the green bridge for aphid carryover and saves on an application of glyphosate."

In a further move to improve soils, the farm has been transitioning from ploughing to minimum tillage over recent years. This has already produced improvements in soil organic matter and structure and increased earthworm populations.

Most crops are now established using a two-pass system of cultivator then drill.

"I'm not fixated on only using min till," says Justin. "You have to be flexible. But we try to avoid soil inversion where possible. This season we haven't had the plough out at all."

### Tissue testing

Another focus on improving crop health has been through tissue testing. Testing last season by the farm's ProCam agronomist, Mark Burgess, revealed some of the wheat was low in potassium,

possibly due to shallow rooting in waterlogged soils from the washout 2019/2020 winter – something that was treated with a liquid potassium application, Mark explains.

With all the changes, the new rotation is now much more dynamic than the old one, which comprised two years of winter wheat followed by winter oilseed rape or beans and then grass. Winter beans are still grown for use in the dairy ration, but oilseed rape has been dropped after flea beetle problems. However, a benefit of the increased forage crop area is that all wheat is now first wheat. Other crops include rotational and permanent grassland and lucerne.

Overall, Justin says the changes have certainly been worthwhile. In theory, the AD plant supplies enough gas to the national grid for 3,500 homes and businesses, though in practice some is retained on the farm, partly to generate electricity to power the AD plant.

"I've worked on the farm for 30 years, but every day is now a school day. We're improving the crops and it's been an enjoyable challenge," Justin concludes.

## Partnering progress

Changes like those of Oncoland offer real opportunities for farm businesses to improve efficiency and farm more sustainably, says ProCam agronomist, Mark Burgess, who has been helping Justin make the new rotation work.

"As we move in the direction of things like ELMs, there's a real opportunity to look at agronomy differently," Mark explains.

"By taking an holistic approach and putting greater focus on soil health and crop nutrition, we're working to proactively reduce the impact of weeds, pests and diseases, and be more targeted with inputs.

"For example, now that we've got digestate going on, we need to know what's happening nutritionally in the soil and in the plant because they don't always correlate. So we're using tissue testing to derive a prescription."

Overall, this regenerative agriculture type approach is a learning process for many farms, says Mark, but there is expertise within ProCam.



*It's an opportunity to look at agronomy differently, says agronomist Mark Burgess, by taking an holistic approach and putting greater focus on soil health and crop nutrition*



# Soil health progression

Taking steps to improve soil health can be easier with the support and reassurance of an experienced agronomist.

As an agronomist based in the north east of England, Hall Charlton sees the full spectrum of soil conditions and works with farmers with a variety of perspectives on soil health.

Whilst there is undoubtedly a lot of noise around soil management, he's not currently seeing wholesale changes on-farm, with many farmers reluctant to move from the status quo until more detail emerges from the new Environmental Land Management Scheme (ELMS).

What is clear, from his own experience, is that those who are addressing soil health usually achieve success through steady progression, without necessarily having to jump into a radical overhaul. It's this step-by-step approach, and awareness of the wider benefits that come with improving soil health, that Hall believes is most likely to encourage more to adopt new methods.

"There's no doubt there are many farms with the potential to improve their soil health," he says, "but I understand the challenges in changing a system that may well have been in place for many years.

"It's important to move at a pace that is comfortable, not necessarily requiring major investment, and not to expect a dramatic difference within one season. Where soils have become depleted over many years, it does take time to bring them back to life. It's about building organic matter levels and creating an environment to improve soil biology and soil chemistry.

"There's no single solution or rigid template. Every situation is different and will benefit from an individual approach to suit the circumstances. However, I've seen the rewards on farms where soil health has been improved – from reduced fuel and cultivation costs though to improved crop performance."

Hall is working with some farms that have been addressing soil health for up to ten years and with others where the journey



*A cover crop of phacelia, tillage radish, oil radish and buckwheat is grown before beans, with the radish included to promote deeper rooting in the soil profile*

is just beginning. In the case of Angus Johnson, with 206ha of arable at Riding Farm, Gateshead, a gradual process had been underway for several years before the catastrophic autumn of 2019 increased the rate of change.

"We have a mixture of soils ranging from silty sand to medium loam, with a lot of land reclaimed from the old open-cast mines," explains Angus. "We've been ploughing and power harrowing for years, mainly growing winter cereals and struggling to find a break crop that worked for us.

"I was looking to move away from the plough and traditional cultivation methods and was conscious of the need to look after the soils better. For several years now we've been using a Tinemaster cultivator as a step towards a more minimum tillage approach and introduced some cover crops on a 50 acre block that has been in continuous winter wheat for years.

"After just a couple of years, we've seen the benefits. The soils are definitely healthier, easier to manage, and I'd say we've seen about a 10% increase in yields."

This positive experience gave Angus the confidence to go further, so when the excessively wet autumn

of 2019 left much of the winter wheat acreage undrilled, farmer and agronomist worked together to turn a crisis into an opportunity.

"Some winter wheat, spring oats and spring beans went in, but a large proportion of the farm wasn't drilled," recalls Hall. "We decided to prime the ground for the following autumn's drilling by establishing cover crops in the spring, as soon as conditions would allow.

"We used multi-species mixes,



*A cover crop including linseed, buckwheat and phacelia is grown prior to drilling oilseed rape to prime the land to maximise the amount of biomass above and below the ground*



tailored to the following crop. These were sprayed off around three weeks before drilling."

With a growing commitment to the minimum tillage approach, Angus found an alternative drilling solution without having to make an investment in new machinery.

"One of our near neighbours has been into minimum tillage for a lot longer and has a Claydon tine drill with spare capacity," adds Angus. "We use this with discs at the front to cope with any remaining cover crop residue and, without ploughing and conventional cultivations, have significantly reduced the time and cost of establishment."

To put the savings into context, ground that would previously have taken as long as five days to plough, cultivate and drill is now being sown in a single day. This is not only a significant reduction in fuel and time, but also takes considerable pressure off the farm at critical times.

Going forward, Hall and Angus agree that a significant opening up

of the farm's cropping rotation is a key element of sustained progress, with cover crops continuing to be an integral part of the plan. Whilst flexibility is important, the general plan is for multi-species cover crop mixtures to be drilled as soon as possible following winter wheat. The cover crop is followed by spring barley, then winter barley and finally oilseed rape before going back into wheat.

### Return of oilseed rape

"We're able to re-introduce oilseed rape as a break crop by using a companion crop of buckwheat and vetches," says Hall. "The companion species create a canopy that reduces pigeon damage, which had been the main reason rape had struggled on the farm previously."

"Other benefits from the more diverse rotation include better control of grass weeds and reduced herbicide costs. On this farm, rat's-tail fescue has been a growing problem, so we've taken some of the lessons learned in blackgrass

control to apply cultivation and rotational solutions to the problem."

The progression continues at Riding Farm, with Angus Johnson committed to his current direction and convinced that soil organic matter is rising, and his farm is making a significant contribution to carbon sequestration. Whilst soil tests will serve to some degree as a measure of success, Hall Charlton is more comfortable trusting his senses when it comes to soil health.

"Until there is some consistent science that the industry can agree on, I think soil health is best assessed by walking the fields, taking a spade to dig some holes and making a visual assessment."

"Firstly, can you walk across the ground without sinking? Then, look for earthworms and observe the physical characteristics, the colour, feel, and the smell of the soil. This, along with the ease with which the soil can be managed and crop performance, will provide some practical indicators of improved soil health."



Oilseed rape is now grown at Riding Farm with companion species including buckwheat and vetches



Once established, the companion species help to reduce pigeon damage by creating a protective canopy



# Under-sowing maize offers multiple benefits

Inter-row drills with the capability of under-sowing grass and other species into standing maize are offering significant environmental benefits alongside a boost to winter and early spring forage production.

Combining innovative drilling technology, dedicated agronomy and specialist seeds mixtures, the approach has now been tested and fine-tuned over six years of development work.

Experience on many farms across Wales and into Herefordshire show how the system creates more stable ground conditions for maize harvesting, avoiding bare soils post-harvest and establishing forage crops with the potential to provide as much as 1,500 ewe grazing days per hectare.

Critical advice on under-sowing mixtures, agronomy and optimum time for drilling is provided by agronomists such as Merfyn Parry, Rhys Owen and Gareth Mitchell, all from County Crops.

“Optimum timing for drilling is when the maize is between 4 and 10 leaf stage – or one week after the last herbicide application,” says Merfyn Parry. “By this stage the maize is established, so able to cope with competition from the under-

sown crop. There will also be minimal effect from any residual herbicides.

“Under-sowing the forage crop in rows between the maize means there is space between plants, again minimising the effect of any competition. Using an effective double disc opener and press wheel arrangement also delivers the required seed-to-soil contact that ensures germination in what can be dry conditions.”

Merfyn adds: “To date we’ve found that the most effective crop for under-sowing is an Italian ryegrass blend, as it has the vigorous growth characteristics required for successful establishment in the conditions. It will then provide a crop that can offer out-wintering potential and/or good early spring grazing.”

Other species mixtures are available for under-sowing, including legumes, herbs and vetches, however, the Italian ryegrass blend has proved nearly 100% successful and produces



*Agronomist Merfyn Parry says under-sowing maize is better for the environment and also increases the productivity of soils*

up to 3t/ha DM by the end of March, at 12ME and 12% protein. This equates to approximately 1,500 ewe grazing days, or 300 heifer grazing days, per hectare, so valuable extra production.

## Compliance

Although future agricultural policy remains uncertain, there is little doubt that there will be a greater

*Under-sowing with an inter-row drill should be carried out when maize is between the 4 and 10 leaf stage*





imperative to farm with high levels of environmental responsibility. The common view is that it will become mandatory to avoid bare ground over winter.

"Establishing a cover crop certainly helps to avoid soil run-off, and that is about protecting the farm's greatest asset," continues Merfyn. "With foliage on the surface, you are reducing the impact of rainfall, and then the roots under the ground create channels to allow effective water infiltration.

"With live root structures in the soil, the organic matter increases and there will be higher levels of microbial activity, and that will mean more earthworms which in turn return more organic matter to the soil. A healthier soil is not only better for the environment, but it's also more productive."

### **A dairy farmer's perspective**

Herefordshire dairy farmer Chris Norman gains valuable spring grazing for his youngstock from under-sowing his maize with Italian ryegrass but believes the bigger benefit is making the primary crop more sustainable.

Milking close to 600 autumn block calved cows on a forage-based system at The Leen, near Pembridge, Chris Norman sees maize as integral to his operation.

The farm grows around 45ha of maize each year, this making up around half of the winter forage ration for his 600 cows alongside grass silage.

Around two-thirds of the maize has been grown continuously on one block of land, with the remainder fitting into the grass rotation. For the last seven years, all the maize has been under-sown.

"We want to look after our soils and, with maize, that means avoiding bare soils over winter," says Chris. "It might be possible in some years to establish grass in the autumn after maize, but we've found that under-sowing is by far the most effective option."

By under-sowing, the grass sward is in place as the maize comes off, eliminating any chance of bare soils. In an autumn like 2019, when wet weather created harvesting difficulties for so many, having a sward in place provided

additional advantages.

"We certainly see added benefits in a wet year as rutting and loss of soil off the maize fields during harvest were greatly reduced due to having the grass sward under the crop," says Chris. "We had an inch and a half of rain around the time the maize was ready to come off in 2019 but were able to harvest two days later with hardly any problems.

"In any year, the cover crop greatly improves the condition of the soil, helping to prevent run-off above the ground and providing stability, soil structure and improved soil biology below ground."

In addition to the soil health benefits, the Italian ryegrass cover crop does provide an estimated 2-3tDM/ha of spring grazing for in-calf heifers or other youngstock, which on its own would more than cover the cost of the under-sowing operation and the seed.

"We'll usually take a first grazing in mid-March and a second bite at the end of April," says Chris. "If it's on continuous maize ground, we'll spray off the sward in time to drill the next crop."

### **Experienced contractor**

Investment in a specialist inter-row drill from Weaving and adaptation of the tractor for row crop operation is allowing Glyn Jones of G & L Jones, Plas Yr Escob to offer

the maize under-sowing service.

An experienced operator covering a full spectrum of agricultural operations, including sizeable acreages of maize drilling, spraying and harvesting, he also grows 50ha of maize of his own and sees significant advantages from under-sowing.

"There's a big advantage in terms of soil structure and stability from having a grass sward established as the maize is harvested," he says. "Also, there are many situations where it simply isn't possible to establish a crop after the maize, so under-sowing may be the only way to avoid bare soils over the winter.

"It may be that farms want to be selective about the fields that they under-sow or may choose only to under-sow the wettest parts of fields, but I can see it will offer some big benefits."

The extra forage generated from under-sowing is certainly something that Glyn feels will be appreciated in areas where livestock are prevalent.

"I don't think there will ever be a shortage of farmers wanting additional grazing over the winter months, so crops established by under-sowing maize will be in demand," he adds. "We lamb around Christmas ourselves so will certainly be under-sowing the maize as the grass we'll have in January and February will be very useful."



*Italian ryegrass blends designed specifically for under-sowing are available through Field Options and ProCam*

# Maximising maize in a marginal area

Growing maize under film is proving to be a game-changer for Carmarthenshire dairy farmer Lloyd Thomas, allowing the re-introduction of the most valuable forage for his 400-cow herd.

Located near St Clears, with high rainfall and heavy land, he'd been forced to abandon the crop some years earlier, but the alternatives never quite filled the void.

With improving technology, a local contractor and the support of an experienced agronomist, Lloyd took the step of growing maize again, but under film, three years ago.

He's now growing around 100 acres a year, with high quality maize making up half of his forage ration. Most importantly, he has confidence in harvesting a mature crop every year and has his cows' performing exactly as he wants.

"We'd been growing maize in the open for about 15 years," he says, "and whilst we had good years there were also some very difficult years due to wet harvests. The inconsistency and the damage to soils forced us to stop growing maize in 2016.

"We've grown wholecrop cereals as a replacement, but maize stimulates intakes and drives

performance like nothing else. When the opportunity to grow the crop under film came about, we were keen to try it."

Local contractor Richard Lewis had invested in a Samco drill and began offering the crop establishment service, so - with advice from Field Options agronomist Gareth Williams - the first crops were drilled under film at Plas Farm in 2018.

"In the first year we achieved a very good crop, harvesting at optimum maturity around three weeks earlier than we'd have achieved previously," recalls Lloyd. "With this success and the impact of the forage back in the ration, we've since had the confidence to grow more."

The farm is now typically yielding 20 tonnes/acre, cutting the maize this year on 21 September at between 32 and 34% dry matter, with starch levels at around 34%.

"This is about the optimum dry matter and texture in a ration that

will be approximately half maize and half grass silage," adds Lloyd. "With maize in the ration, we see cows' appetites increase, along with yields and butterfat levels. It's the key ingredient for producing quality milk."

The cows at Plas Farm are averaging 9,800 litres per lactation, with milk constituents at levels that maximise its value under the farm's current contract. With maize being crucial to the cows - and with the investment of growing under film - maximising crop performance is crucial and requires attention to detail at every stage. Alongside a specialist contractor, Lloyd relies on Gareth Williams, an agronomist with knowledge of the system as well as the local area.

As with any crop, choosing the best variety for the situation can be critical and this is especially so when growing under film.

"I currently recommend Isanto at Plas Farm," says Gareth. "It is a consistent performer under film and has again done well in Field Options' trials. It's a good all-rounder, delivering high dry matter yield, high starch and energy yields and is also very good against lodging."

Maize at Plas Farm benefits from generous applications of muck, with around 3,000 gallons/acre of slurry going onto the ground early in the year and plenty of farmyard manure also being applied later.



*The Plas Farm Isanto maize was very well established by 2nd July*



This is monitored by Gareth with any additional artificial fertilisers applied in line with the maize crop's likely uptake and according to RB209 recommendations.

Weed control is another critical area, so a clear strategy is important. This starts by growing maize as part of a rotation, as opposed to continuous cropping, to minimise the weed burden.

"It's rare that maize is grown more than two years in a row at Plas Farm," adds Gareth, "with crops generally followed by spring barley grown for wholecrop.

"Prior to ploughing, fields are sprayed with glyphosate to give the crop a clean start. Then, all the weed control is done with a pre-emergence herbicide applied as the film is being laid.

"Ideally there should be no need for any post-emergence herbicides, but we do have splitters available to part the film and allow later weed control if necessary.

"It's also important to guard against eyespot in this area, especially in second year maize. When applying the fungicide, it's usually beneficial to include foliar nitrogen, applied as late as possible it will help with cob formation."

## Film options

One of the key areas where growing maize under film has advanced in recent years is in the improvement of the Samco



*Agronomist Gareth Williams provides a guiding hand to ensure the best returns from growing maize under film*

film, and in the development of alternative film types for use in different conditions.

"We use the new Samco blue film at Plas Farm as it degrades reasonably quickly," adds Gareth. "This is important environmentally and helps the crop emerge with minimal stress.

"Another major factor on this site is the likelihood of strong winds. The Samco blue film has mini pin holes that allow wind through as well as holes to allow water through, reducing the run-

off down between the rows that can lead to lifting of the film in windy conditions.

"Lloyd rotates his maize ground, so weed control is simpler. There are faster degrading films available within the Samco system, where required."

Staying abreast of the developing technology is important to farmer and agronomist alike, and hence several alternative film types were trialled on the farm in 2020.

"We looked at four different films this year, but results haven't given any reason to change," adds Gareth. "Some faster degrading ones were too quick for this area, because if the maize is out too soon, frost risk and crop stress can be a factor. Some of the older films are too robust and hold the crop back. It's nevertheless good to keep looking to see how we might be able to improve."

Cows at Plas Farm are now performing very well off the 2020 maize crop, despite challenging growing conditions that included an unusually dry April and May.

"Our maize was way ahead of crops grown in the open this year, when dry conditions certainly held a lot back," says Lloyd. "The film creates a micro-climate, holding in the moisture, and that really made a difference this year.

"We ended up with a crop 10 to 12 feet high and ready for harvest well before the end of September, and the silage is feeding very well. The cows' performance by far the most important thing."

*Samco Blue is the preferred film for use at Plas Farm as it minimises any risk of wind damage and is sufficiently robust to protect the crop against any late frosts*





# Regional responses to yellow rust

With yellow rust an evolving threat, how are wheat crops best protected? ProCam agronomists around the country offer their views.

## Southern strategy

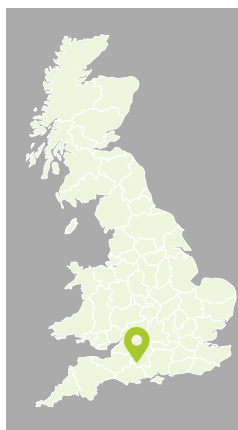
Yellow rust is a sporadic disease, but it's become more unpredictable. And when it strikes, it can quickly become a major problem and cost up to 5t/ha in lost yield.

That's the view of Wiltshire/Dorset-based ProCam agronomist, Phil Edwards, who says yellow rust becomes most visible between T1 and T2 in his area, but is probably already in the crop well before then.

"Recent dry springs have favoured it. We've also seen in the past how quickly variety resistance can break down.

"Where it becomes really hard to control and really damaging is if fungicides are omitted or applications are late. I aim to keep key fungicide intervals at 21 days."

Phil says infections often begin unnoticed in headlands or where the sprayer has under-dosed as the boom turns in the corners of fields. From here, in the right conditions, it can spread across fields within days.



*Frosts can halt yellow rust, says Phil Edwards, but this can be academic if a variety's resistance is breaking down*

"Yellow rust is straightforward to keep on top of, but you must get the basics right. We have some good fungicides for preventing it, and yellow rust-susceptible varieties are often very yield-responsive," he says.

## North West knowhow

Everyone says yellow rust is a southern or eastern problem, but we get it here too, says Kathryn Richards, who advises farmers in Lancashire and Cheshire.

It also comes into crops faster than it used to, she says, leaving less time to control it and can spread quickly into neighbouring fields.



*Check a variety's parentage, urges North West agronomist Kathryn Richards, for clues to whether its resistance could break down*

"For winter wheat varieties without juvenile resistance to yellow rust you hope that adult plant resistance will kick in early enough. But if rust has already built up by then, it becomes difficult to control. A good T0 fungicide can be important, especially if the weather is favourable for yellow rust," she explains.

With the impending loss of long-time stalwart fungicide epoxiconazole later in 2021, Kathryn will be reaching for alternative products. "We still have tebuconazole, but at T1 for rust I really like solatenol and a partner product on a susceptible variety. It seems to do a really good job."

With fungicides in general against yellow rust, Kathryn agrees that timely spraying is crucial. Last year, where the resistance of one of two varieties grown in the same field broke down, she says an application delay of just three to four days revealed to a line the variety whose yellow rust resistance had declined.



## Eastern experience

Advising growers in the historical heartland for yellow rust, East Anglia, means Drummond Scrase is no stranger to its dangers. Over the last two years, it's been a bigger priority than Septoria in his area, he believes.

"Some popular varieties have been hit hard by yellow rust recently," says Drummond. "It's become a dominant feature.

"Where varietal resistance has broken down, it's been very apparent during the season – particularly where fungicide intervals have been stretched or where fungicide programmes without sufficient yellow rust activity have been used."



*Milder winters and humid weather are reasons why yellow rust can be such a problem in Eastern counties, particularly in coastal areas, says Drummond Scrase*



The timing of when yellow rust becomes visible to any significant degree depends on the season, says Drummond. Sometimes it can be in early March.

"Certainly, yellow rust often becomes noticeable where growers choose not to use a T0 fungicide. You're probably going through the crop with a plant growth regulator at this time anyway. So, for little extra cost, you have to ask yourself why you would miss a fungicide out?"

When assessing risk, Drummond says he starts by taking account of the variety. Earlier sowings will also be exposed to the disease sooner, and are at risk of green bridge infection if a second wheat. However, later sowings can be hit hard by the disease because they only have a small leaf area, so even a low level of infection can be highly damaging, he adds.

"I will be looking to treat accordingly with tebuconazole at T0 and then maintain ongoing yellow rust prevention at T1 and T2.

"If yellow rust pressure has been extreme I've even had to apply another tebuconazole spray between the T1 and T2 timings. This has only been in exceptional cases, but it's still paid for itself. The important thing is

not to stretch fungicide intervals. Thick wheat canopies also provide an ideal microclimate for yellow rust to flourish," he adds.

## Western wisdom

Harry James advises farmers in Herefordshire, South Wales, Worcestershire and parts of Shropshire. He says yellow rust traditionally hasn't been a big problem in his region – it's mainly Septoria. But the weather over the last few seasons has been conducive to it.

This has been compounded by the fact that varieties typically chosen in the west for Septoria tritici resistance have generally been more susceptible to yellow rust, he notes.

"We've also had variety breakdowns to new yellow rust races. Many varieties have been bred from a fairly narrow gene pool in their parentage, sharing parent breeds. So when one breaks down, they all succumb. There is a danger in looking at a variety based on yield and not considering enough its agronomic ratings.

"I've certainly seen yellow rust erupting around T1. So T1 is often our main timing for dealing with it, and then keeping the spray interval tight to T2. If spray timings do get stretched and the weather is conducive, that's when we have problems.

"On certain varieties I'll also build in rust activity



*Conducive weather and varieties chosen more for their Septoria tritici resistance may have fuelled yellow rust in the West, believes Harry James*

at T0, and may even look at a low cost rust-active fungicide between T1 and T2 if significant activity has been seen at the T1 timing.

"Septoria is still our number one disease concern in the west. But two years ago yellow rust took us by surprise with varietal breakdowns, now we're ready for it," Harry adds.

*(Continued on page 16)*

# Regional responses to yellow rust

*Continued from page 15*

## Technical trials

With weather conditions down the eastern half of the country favouring yellow rust, wheat in North East England can succumb to infection as early as autumn, says ProCam trials officer Jodie Littleford, who has been studying the disease closely in ProCam's trials at the Stockbridge Technology Centre, Cawood, North Yorkshire.

And with yellow rust so unpredictable, it is very difficult to prepare for an epidemic, Jodie explains.

"Weather is one of the largest drivers. In wetter years, Septoria takes over the leaf area, so there's less space available for yellow rust to colonise. But in a warm and dry spring, yellow rust dominates. Trials show it's also very difficult to rely on variety resistance," she adds.

"Last season, despite all varieties in our Cawood trials being rated 7 to 9 against yellow rust, some had mountains of the disease in them while others had a minimal amount. KWS Extase was an example that was robust against the disease. Also, as soon as Gleam and Graham got to stem extension, when adult plant resistance kicked in, they had very little.

"Hopefully, the new AHDB yellow rust resistance rating system, which includes a greater weighting on results from more recent trials, will help with its management, but we also know how quickly variety resistance can break down."

Looking ahead, Jodie suggests greater priority may need to be placed on controlling yellow rust than *Septoria tritici* in some

cases – simply because history has shown variety resistance can slip even during the course of a year.

"At least with Septoria, while the weather is unpredictable, variety resistance ratings have historically been fairly stable. But with yellow rust, as well as the weather being unpredictable, you don't know if the variety's resistance is suddenly going to decline.

"Ultimately, timely prevention remains crucial. A TO proved its value last season in our trials. If yellow rust catches you out, you can be chasing it all season," Jodie concludes.



*A TO fungicide proved its value against yellow rust last season in our trials, says Jodie Littleford*



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