

“ Even the good genetics can break down, so anything you can do to protect potential as much as possible is key. ”

Managing risk for reward

Forward-thinking farmers

As growers look to bring in new innovation to even out crop production, build resilience and farm with the environment in mind, one grower in Suffolk is seeing benefits from utilising latent disease detection technology. CPM visited him to find out more.

By Charlotte Cunningham

It's a 'bluebird' day in Suffolk, with the low January sun above twinkling on the distant fields of frost-covered young wheat.

The winding drive up to Ovington Hall is immaculate — a testament to James Nott's eye for detail. "I'm not a tech person, I like to keep things simple," he laughs. "But I do like to have control over what we do as it gives us the ability to react to what's in front of us."

The business operates primarily as contract farming — though there's a ninth-generation family farm at its heart — growing around 1619ha of combinable crops.

As British and global food production faces unprecedented challenges, consistency, reliability, and quality are

core parts of the strategy for James.

As such, he's incorporating a whole host of measures and tools — from variety choice to latent disease testing — to ensure his operations and decisions are both profitable and sustainable.

Late disease

For any arable grower, disease is ultimately one of the biggest threats to crop production and such is the case for James. "Obviously, we're in the dry East, but my two biggest priorities are yellow rust and septoria — though the prevalence of these can be very unpredictable."

As was the case last year — a difficult season which caught many growers off-guard, particularly with regards to septoria, he points out.

"Last year, spring started off in a fairly normal way — we weren't finding much disease and the national picture wasn't showing much different."

While it wasn't a particularly high-pressure year, a lot of disease came late on. And though, to an extent, events like last year may be slightly out of the control of growers, there are several strategies which can be put in place to negate that risk where possible, believes James. "As a general rule, I'd say my disease control is quite good."

The first line of defence is variety choice and drilling date, he explains. "Every year I'm looking to improve our varieties. I'm a home-saved seed man, but I do like to

bring one new variety in per year."

Variety wise, robustness is key for James, particularly those with good inherent disease resistance in an untreated situation.

In terms of wheat, at present he's growing KWS Extase, Gleam, SY Insitor and Crusoe. "Extase is a really important variety for us. You can go home thinking at least if the worst comes to the worst, it's got a very high untreated yield. But, if conditions are right, it's shown a good economic response to fungicides too. That's the kind of variety that lets you sleep at night," he laughs. ▶



Disease testing and weather technology helps to build a more accurate picture of what's going on with disease levels at a point in time, explains James Nott.

TAILORED WILD OAT STRATEGIES

TAILORING GRASS WEED STRATEGIES TO SPECIFIC POPULATIONS AND PRESSURES IN INDIVIDUAL FIELDS WILL HELP GROWERS AND AGRONOMISTS OPTIMISE CONTROL OF WILD OATS. ADAPTING HERBICIDE RATES, SEQUENCES, APPLICATION TECHNIQUE AND, WHERE PRACTICAL, TREATMENT TIMING, ALL HAVE IMPLICATIONS FOR AGRONOMY DECISIONS.



Identifying wild oat species and germination timing will help to tailor control strategies

Identifying your wild oat species, its germination patterns and the size of weeds already present in the crop will all dictate appropriate actions, advocated Syngenta Technical Manager, Georgina Young. Field walking and weed mapping over the coming weeks will help assess the scale of the challenges faced.

"Early identification of winter germinated wild oats will enable more effective targeting of herbicide programmes in the spring."

Adapting this season's wild oat strategy:

- Wild oat germination timing & size
- Growing conditions
- AXIAL[®] Pro rates
- Application techniques
- Herbicide sequences

*Overwintered winter wild oats (*Avena sterilis*) are more difficult to control, compared to later germinating common spring wild oats (*Avena fatua*).

Mapping the extent of overwintered wild oats now, whilst they are more easily seen in the growing crop, will help with decision making for AXIAL[®] Pro timing and application," she advised.

Winter wild oats typically germinate between October and March; the earlier established and larger the weed, the more challenging it can be to control. However, growers should be aware that common spring wild oats can also germinate in autumn or early winter. Overwintered weeds are more competitive with the crop, making their removal a priority.

"Challenges for wild oat control could be further compounded by the size of the crop canopy – which can make the grass weed target more difficult to hit – and slow spring growing conditions that would limit herbicide uptake," highlighted Georgina.

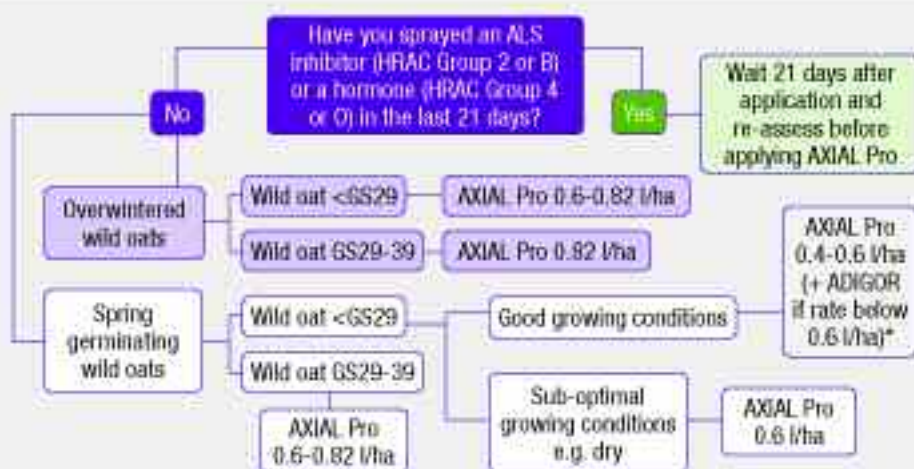
"For maximum efficacy, maintain higher herbicide rates and, where weeds are difficult to hit, adapt application technique according to crop and weed growth stage."

With overwintered wild oats up to growth stage 29, she advises an AXIAL[®] Pro rate of 0.6 l/ha in good growing conditions, increasing up to the maximum 0.82 l/ha where growing conditions are compromised. For larger weeds, up to growth stage 39, the higher rate of 0.82 l/ha would be the default, she added.

Later germinating wild oats in the spring can be controlled with AXIAL[®] Pro rates as low as 0.4 l/ha whilst still small (less than GS29). ADIGOR[®] will need to be added with this lower rate. Rates will need to be increased where wild oats are larger or any mixed populations of overwintered weeds are present.



Utilise crop walking visits to identify wild oat populations now for future agronomy decisions advises Georgina Young



For more information and to review a new easy to follow decision matrix for spring 2022 wild oat agronomy, visit www.syngenta.co.uk/wild-oats

THE SYNGENTA FIVE-POINT PLAN TO TACKLE WILD OATS:

1. Field walk in the early part of the season to identify overwintered populations.
2. Map field populations of wild oats over several seasons.
3. Identify the species of wild oat on your farm at ear emergence.
4. Plan your control strategy, taking into account likely germination patterns.
5. Test for resistance if poor control is identified.

*0.6 l/ha is the maximum supported rate of AXIAL[®] Pro for wild oat control if applying in mixture with an ALS inhibitor (HRAC Group 2 or B, haloxyfop (Arylex), fluroxypyr or clopyralid)

Forward-thinking farmers



qPCR disease testing technology allows growers to 'sense-check' their fungicide programmes ahead of time, explains Ella Crawford.

► “I’m also now an October driller — moving from mid-September to the first of October. I know for blackgrass we’d want to be closer towards the middle of October, but that’s not really realistic here.”

The combination of the two has really highlighted some of the strength in genetics, particularly with regards to drilling date and septoria, he adds.

James says that this insight allows him to refine his strategy for the fungicide programme, but he’s also been optimising technology to guide this decision-making too.

This includes using Bayer’s ‘Crop Check tool’ Rapid qPCR technology in his approach and testing whether what he’s doing is enough to keep yield-robbing disease at bay.

The technology is used to detect latent septoria and yellow rust levels at a given moment in time, providing growers with a score for their current risk level and indicating whether they’re in a preventative or curative situation.

Bayer’s Ella Crawford has been heading

up the testing at James’ farm and looking at how the data can be used to inform and adapt fungicide decisions.

“Based on James’ move to later drilling, an example of something we looked at last year was comparisons between a crop of SY Insitor and KWS Parkin — with the Insitor drilled in September and the Parkin in October.”:

Strong genetics

“Insitor is has a relatively robust septoria resistance score of 6.5, but this actually ended up with more septoria in it than the Parkin (rated at 5.5) — according to the qPCR test — proving that the drilling date really can make a difference.”

In fact, now sown in that October window, James says Insitor is his best performing variety on farm. “It’s streets ahead of anything else.”

And though varietal resistance is a core part of the disease control strategy, Ella warns that even strong genetics can break down, so anything growers can do to protect potential as much as possible is key.

“Last year I was comparing two different variables and it was quite interesting to monitor the septoria on different leaf layers



The farm uses a number of different technologies, including weather stations, to help guide crop management decisions.

on farm, but the real value comes when thinking about how this can be used in the field,” she explains.

“What we’re trying to understand and get across is that while you can get varying levels of disease, if growers are getting a score of 0 from the PCR, it doesn’t mean that they should take their foot off the brake in terms of fungicides.

“Instead it should be used as a confirmation to continue with your planned approach — which would have been based on drilling date and variety. So in this scenario, you can see how the technology can be brought in to close the loop and really sense-check the strategy.”

Ella explains that if the score showed a level of infection that would put a grower in the high-risk category for example, that could signal that it’s perhaps time to relook at the plan. “This score would indicate that the risk of disease is likely to be higher, giving growers an opportunity to prioritise the field tested, increase the rates, or change the programme slightly.

“A lot of people last year saw a lot of 0 scores early on and as a result, cut back on some of the planned applications, which may have led to more infection later in the season. It’s really important to remember that these results are just a snapshot of one moment in time to help growers stay on top of disease risk. It’s not a replacement for good agronomy, however, and this tool should always be used in relation to other factors that could affect disease levels in the crop.

“Being in a preventative situation is a much stronger position to be in than not applying protection, and then trying to cure it when it’s too late.”

But how is James using this on a practical scale? “When I’ve got a score of 0, I’ll always put a fungicide on, but a 0 score indicates the optimum protective position meaning more flexibility in my fungicide application. It highlights the potential of disease testing to optimise fungicide return on investment.

“You’ve also got to watch the weather and I have weather station technology on farm to monitor this. When we incorporate these with the disease testing data, it just helps to build an accurate picture of what’s going on at that moment in time, which is really beneficial.”

Those moments in time last season alerted James to the possibility of holding back an SDHI until the T3.

He says Aviator (prothioconazole+ bixafen) would’ve been a good option when late foliar pressure developed. This season, James says he will await test results before

Rapid qPCR – how it works?

PCR testing has become a very prevalent part of life over the past two years, but the benefits of such technology span further than just detecting coronavirus in humans. Bayer’s Rapid qPCR can help inform and justify fungicide decisions, with over 80,000 leaf tests carried out last year, explains Ella.

But how exactly does it work?

“Latent disease testing gives an insight into what exactly is happening inside the plant, rather than just relying on visible external symptoms,” she says. “This extra level of information can help growers adapt strategies to tackle diseases before they

become unmanageable.

“Bayer has been evaluating various qPCR technologies over the past eight years and in its simplest form, allows us to sample part of the plant and pass it through the qPCR test to show the quantity of septoria DNA in the leaf.”

Looking to the future, this technology won’t just be available in wheat, says Ella. “We’re expanding the testing into other crops at present and though it won’t change variety choice and cultural influences like drilling date, the qPCR technology and how you utilise it can be a really important part of the strategy.”



Bayer's rapid qPCR technology looks at latent disease levels within crops.

making any calls but it's a practical solution where fusarium and late foliar disease threaten.

Often with increased efficiency comes a better environmental outlook for farm businesses, and while James says this isn't his biggest priority, farming with the environment appears to subconsciously be in the DNA of the business.

Managing the amount of fungicides they put on in relation to the weather and the disease situation at the time is an example of this, he says. "Essentially, this is the way things are going in farming and I'm on board with that fact — that we've got to protect the environment too."

James explains that he was the first farm in the UK to adopt bio-filtration technology for his spray operations. "We have several sensitive water courses close by and I'd felt for some time that how we were washing down the sprayer could be better."



Pulse width modulation has helped eliminate both over and underdosing of chemistry on farm.

The purpose-built system is ultimately self-sufficient, using bacteria to 'filter' out the contaminants. "What comes out is 100,000 times cleaner than what used to be washed off sprayers, reducing chemical point source footprint reduced by the high 90% mark," he explains.

But what difference has it made on farm? "Everything has become much more contained and protected. Something that's been really noticeable is that my sprayer operator is much happier too."

He has seen operational benefits too — one being the availability of the sprayer at any time. "The unit is very well insulated, so the sprayer is ready to go at any time. We no longer have the chore of pumping out anti-freeze and it offers protection against brittleness for seals and gaskets during prolonged cold spells. It also makes a late application of Kerb (propyzamide) a little easier."

Sprayer technology

Another bit of technology that's been really beneficial is pulse width modulation on his sprayer, he notes. "I think it's a great bit of technology. There are two things I really like. Firstly, when you go around a corner, it slows down jets one end and speeds them up at the other. So on a turning curve, we're putting the same amount of chemical on the inside of the boom as the outside of the boom," says James. "This means we're now controlling blackgrass against the hedge and ensuring we're not overapplying."

"This is the same for disease control if we're spraying round a telegraph pole, for example. From an environmental perspective, it's helped us eliminate both over and underdosing."

"The other thing we can do is change droplet size really easily. If the operator was spraying near a residential area, for example, he can easily spray coarsely on one side, and fine on the other —



James was the first farm in the UK to install a Biofilter.

which is great for keeping the public happy. It's a fantastic tool."

So what's next for James? Something he's particularly interested in is the potential in grain maize as a break crop. "I've recognised for a long time that maize is a crop we can grow quite easily in this country. I think it's an incredibly viable option and for us — the most viable break crop, in fact."

"You look at what crops others are growing, like soya and millet, and the gross margin is nowhere near as impressive, whereas grain maize can be as good as a first wheat."

"But it does have its challenges, and I think the thought of combining in October puts a lot of people off. But the way I see it, is that if you're mad enough to grow soya beans, why wouldn't you consider grain maize?"

Taking a completely holistic view on crop production, James says he's also looking at the potential of including other aids like biostimulant products. "I'm open to anything and I've played with them on farm — they've been either brilliant or terrible. But when they work, they can really knock your socks off and anything that helps build stronger, better crops can only be a good thing." ■

Forward-thinking farmers

With robotics, gene mapping and molecular markers, digital technology and bio-chemistry it is a dynamic time for anyone involved in agriculture.

Challenges lie ahead, namely the need for UK agriculture needs to improve its productivity while minimising its environmental footprint. But farmers have always had to deal with change and adopt new ideas and technology.

Bayer is at the core of helping UK farmers achieve this. Working with farmers throughout the UK and further afield it's evaluating

different farming techniques, trialling, and developing new diagnostic tools for greater insight and refined decision making coupled with innovative plant breeding and product development programmes.

Innovative solutions and services will emerge to assist farmers achieve profitable and sustainable agronomic practices. There is much to look forward to and this series of articles will look at how partnership between farmer and industry can achieve this together.

