

Tests and tools to track and trace

Technical Forward-thinking farmers

Decent diagnosis of in-field issues ensures the right product is applied in the right place at the right time. *CPM* reports on the progressive growers and agronomists helping to refine the techniques.

By Tom Allen-Stevens

James Mayes confesses he has a little trepidation for what the season holds for his wheat crop.

He manages 800ha of combinable crops for Sentry at Bentfield Bury Farms, near Stansted Mountfitchet, Essex. The wheats are all Group 1 quality types with KWS Zyatt and Skyfall in the rotation, and there's one field grown as a blend of the two this year as a trial.

It's the prospect of managing disease with a reduced armoury that's giving him pause for thought, however. "We know we have to stay in the protectant zone, and that's rarely been a problem. But last spring we had chlorothalonil and disease levels were very low. This year could be an entirely different animal, and we're facing it without CTL — how will that change things?"

Key concern

Yellow rust has always been a key concern. "But it's a disease we know how to manage. We never underestimate septoria, though, and know the damage a wet spring can do."

This year there are a couple of extra tools in the armoury that James hopes will help him though. He's putting Bayer's Rapid Disease Detection service through its paces and has also signed up to the free trial of Climate FieldView, Bayer's digital platform.

It's part of a long-standing relationship

with Bayer for James, as the lead in a group of eight Sentry farmers. "For many years we've undertaken tramline trials with Bayer's Xpro club and a number of us wanted to get involved with YEN. Bayer's a key sponsor of YEN, and offered to facilitate bringing us together as a group and make the most of what we get out of it."

Now in its fifth year, the group gathers twice a year — just before harvest and again in Nov or Dec, when they take a close look at the YEN reports. The report gives a full analysis of how the field in question performed, as well as its maximum potential yield, benchmarked against other YEN farmers.

With a farm average wheat yield of around 9.5t/ha, James' YEN crop tends to perform at a middling 10.5-11t/ha. "We have had an 11.5t/ha crop of Skyfall that achieved best percentage of potential yield in our group and 17th nationally," reports James.

"But for me, it's not about the competition. That result opened my eyes to what we could achieve off some of our more variable soil, and as a group, it really helps us focus on what improvements we can make."

The six-year rotation on the farm includes oilseed rape, peas, beans and winter and spring barleys across its mainly chalky boulder clays. "Our calcareous soils are prone to nutrient lock-up, notably phosphate, so we're doing more tissue testing. In the past year we've also joined YEN nutrition, bench-marking grain analyses to better determine our offtake levels and overall grain nutrition levels."

While involvement with YEN is helping James address nutrient issues, last year he also submitted samples for Bayer's Rapid Disease Detection test for the first time. James joins Bayer south east ▶



Bentfield Bury Farms has had good results from Skyfall winter wheat, and this year are trying a blend with KWS Zyatt.

“You can't actually see any disease, so it's useful to know what's there in its latent phase.”

MAP A ROUTE TO WILD OAT CONTROL

- > Identify most challenging overwintered wild oat populations now
- > Adapt spring control strategies and application to weed sizes
- > New scouting tool to improve decision making

IDENTIFYING OVERWINTERED WILD OAT POPULATIONS NOW, WHILST CROPS ARE OPEN AND BEFORE SPRING FLUSHES, WILL ENABLE MORE EFFECTIVE SPRING CONTROL STRATEGY DECISIONS THIS SEASON.

Syngenta Field Technical Manager, Georgina Wood, highlights that with some significant cold spells this winter, wild oats which germinated in the autumn will be waxy and more challenging to control if allowed to grow.

Understanding the population now will allow better tailoring of herbicide rates and timing of treatments, along with adapting application techniques, she advocated.

"It is now apparent that more fields have mixed populations of winter and spring (common) wild oats (*Avena sterilis* and *Avena fatua*).

"Knowing the species can help predict the principal timing of germination. However, you can expect a protracted emergence at any stage from early autumn, right through to late spring."

Winter wild oats are considered more challenging and requiring more robust strategies. The species may also be showing a higher potential risk for herbicide resistance, although both winter and spring wild oats can be controlled with AXIAL[®] Pro, she added.

"Overwintered wild oats are more difficult to control than those germinating in the spring, because waxy leaves make them more difficult to target and the sheer size of weeds and root systems are harder to kill."

Where overwintered weed populations are identified, they should be targeted with AXIAL Pro as soon as growth recommences.

"Delaying application for longer, to wait for spring germinating wild oats, will only make the bigger weeds even harder to remove, along with the effect they would have had on the crop's development, and being more competitive they have a greater impact on the crop's yield."

Earlier treatment of overwintered wild oats, before the crop fills out, enables sprays to be better targeted onto the grass weeds. **"As the season progresses, operators may need to adapt their nozzle choice and application techniques to achieve optimum results,"** she warned.

DIGITAL SCOUTING

The new Syngenta scouting and digital agronomy tool, Protector, could offer growers and agronomists a step change in wild oat management, along with all weed, pest and disease decision making.

GPS tagged recording of wild oat populations, using the digital scouting tool during field walking, will provide a clear picture of problem areas, reported Miss Wood. That could enable individually customised thresholds to prioritise treatments on a field-by-field basis, or for generation of variable application maps.



Identify and record wild oats early to track populations and control, advises Georgina Wood

"Importantly for wild oats, the tool enables return to precisely the same spot in the field to evaluate treatment success, and to assess any weed species in the summer. Longer term, the information recorded will be an essential part of an integrated grass weed control strategy," she added.



Syngenta Protector is currently under detailed practical evaluation in the UK by growers and agronomists, with plans to be widely available from late spring this year.

TESTING TIMES

Visit www.syngenta.co.uk/wild-oats to find out more about wild oat management and test your ID skills

Forward-thinking farmers



The Sentry group gathers twice a year – just before harvest and again in Nov or Dec, when they take a close look at the YEN reports.

► commercial technical manager Richard Prankerd in a Zoom call to discuss results and the plan for the coming season.

“We first started qPCR analysis seven years ago to detect septoria DNA in wheat leaves before symptoms show,” explains Richard. “This was used in internal trial crops to get a better picture of whether fungicides were being applied in a protectant or eradicant situation.”

“We’ve now moved to a rapid test with results coming back within 48 hrs, making it a practical in-season tool for growers to inform fungicide rates and choice at the main T1 and T2 spray timings.”

So five days before a planned application last year, James collected around 20 of the top two leaves in the crop canopy and sent them in for analysis. “You can’t actually see any disease, so it’s useful to know what’s there in its latent phase,” says James.

“For us at Sentry, it’s also been a useful

discipline to get into the crop and look in more detail at what we’re facing as each spray timing approaches — you pick up other aspects that may need addressing,” he notes.

He chose a field of Zyatt, late-drilled in Jan, and Oct-drilled Skyfall. “The Zyatt didn’t receive a T0 spray — we went straight in with the T1. The Skyfall had an early dose of tebuconazole with CTL. We were keen to know from the test whether that would make a difference, and then how disease would develop up to the T2 timing.”

In the end, there was very little disease at both timings, largely down to the lack of rainfall — just 0.5mm was recorded on the farm throughout May. Richard reports a slightly higher level of septoria was found in the Zyatt, “but levels overall were so low it could just be background noise. In a normal season, you’d expect to see significant differences in these

scenarios you could then act on accordingly (see panel below).”

This year there’s a plan to use Rapid Disease Detection to pick up any yellow rust in the crop, as well as septoria, and to use FieldView to inform decisions. This was used with the Sentry team for the first time last year, and the biomass maps the digital platform generates can be useful to direct in-field monitoring, Richard explains.

“It gives you a regular check of how the crop is developing, and unlike other platforms, the biomass map in FieldView doesn’t saturate later in the season. That’ll be a good guide for areas of the field you’ll want to sample with Rapid Disease Detection.”

So what about the field with the blend of Zyatt and Skyfall? “They complement each other well on septoria, but there’s a potential issue on yellow rust,” says Richard. “The two varieties have quite



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DNA testing reveals how septoria surges

Just how quickly a septoria threat can develop can be seen from the data Bayer has acquired via various diagnostic tools since 2014, explains Richard.

“Most of the work has been undertaken at our septoria-prone site at Callow, Herefordshire. Unfortunately, the autumn of 2019 put paid to trials for the 2019/20 season but 2018/19 results were revealing.”

In 2019, the level of septoria DNA jumped after a series of rain events in late May and early June — until then, DNA measurements had barely registered. First assessments taken on leaf two in Elation, Motown and Sundance, just ahead of T2 sprays on 24 May, revealed only untreated Elation carrying perceptible infection — this being under 10 pp/μl (picograms per billion). Further assessments just ten days later showed a significant increase in septoria DNA with untreated

Elation coming in at over 250 pp/μl and Motown not far behind.

For Richard, it highlights how quickly rain events can change septoria severity. “Growers have an idea of risk based on variety and drilling dates but they are unaware of the weather to come. In 2019, the dry spring had kept septoria in the base of crops, and there was talk of cutting rates at T2. But these results show if you have background septoria it only needs a few rain events to kick it off.”

The work has also shown the value of variety resilience. Richard believes this can add an extra ten days to a fungicide spray window, but it’s dependent on drilling dates, winter weather and rain events ahead of key growth stages.

“In 2016 DNA testing of leaf two, just prior to T2, revealed big differences in septoria levels between KWS Trinity, Revelation and KWS Siskin.



Testing of leaves in wheat at the Callow trial site in 2019 showed the level of septoria DNA jumped after a series of rain events in late May and early June.

At 5.7 Trinity was the most susceptible to septoria and some samples carried DNA levels twenty times above that of Siskin. No variety is immune to septoria, but what varietal resilience offers is the chance to schedule sprayer rosters around crops at highest risk,” he says.

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 for UK agriculture, such as improving 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 these agricultural advances, working with farmers throughout the UK and further afield to trial and develop new

diagnostic tools and evaluate different farming strategies, coupled with exciting plant breeding and product development programmes. It will help us develop innovative solutions and services to assist farmers achieve profitable and sustainable agronomic practices.

Despite the challenges facing UK agriculture there is much to look forward to. This series of articles focuses on how innovation and partnership between farmer and industry will help us face the future together.



similar growth, though, so it'll be interesting to see how they develop together and whether disease levels differ

from where they're grown alone." Having grown both varieties for three or four years, James is familiar with their

growth habits and grain characteristics tend to be similar. "I'm not too concerned with yellow rust, although we know pathogen populations are evolving so I want to stay ahead of what's happening in the field," he says.

"I hope the testing and analysis we do this year will help not just with disease, but how the crop develops and how we can retain green leaf area. There's no substitute for late season rainfall, but the crop's got off to a good start. With the right management, informed by in-season testing, we should be able to achieve its maximum potential."

• Growers interested in taking part in the free trial of Climate FieldView should get in touch with their local Bayer representative. ■

Resistance testing reveals a weed worry

Growers have been advised to keep an eye on blackgrass and especially ryegrass in winter cereal crops this spring. Ryegrass plants with a high level of resistance to residual herbicides have been identified through testing.

Bayer has been working with individual growers and agronomists, investigating instances of suspiciously poor control from autumn-applied residual herbicides, and helping with testing where necessary. One of the first confirmed instance of resistance in the UK was spotted by ProCam agronomist Kevin Percy, who looks after crops in Essex, Herts, Bucks and Glos.

"We have pockets of bad ryegrass where resistance to contact herbicides has already been confirmed, and here we rely on programmes based around flufenacet, diflufenican and pendimethalin with prosulfocarb and triallate added where necessary," he explains.

"What was concerning was poor control from a pre-emergence application. We needed to be sure this was truly poor control, and not survivors of a



Ben Giles recommends those who suspect resistance to get samples tested, ensuring this is based on the pot-test method.

high background population nor the result of poor application."

Kevin contacted Bayer commercial technical manager Ben Giles who sent seed samples for testing in Germany in July 2018. "They came back as RRR resistant to both PDM and Liberator (flufenacet+ DFF), and that's really worrying," says Ben.

Further work by Bayer as part of a pan-European study has shown the sample had an ED90 (the level of active ingredient required for 90% control) for flufenacet of 800g/ha. "That'll mean the typical field rate of 240g/ha will give very poor control," he adds.

Ben stresses that only a few instances of pre-em resistance in ryegrass have been confirmed in the UK. "We haven't yet identified a case of blackgrass resistance, although reduced sensitivity has been confirmed through testing. In these cases a well applied full rate of herbicide will still deliver good levels of control."

But Kevin notes that ryegrass can be more tricky to control than blackgrass with less effective cultural options. "It germinates all year round, and populations aren't knocked back as much by a double spring break or a two-year grass ley," he points out.

"If you know the ryegrass population is resistant to residual chemistry, I would advise taking the affected areas out of crop production through either a mid-tier option in Countryside Stewardship, or preparing to adopt an ELM option."

Ben notes the importance of good hygiene to stop resistant seed spreading. "The key one is where you import straw that's then spread with muck, or transfer through contractors. It's important machinery is cleaned down between farms. The lesson from Australia is that resistant



With few cultural options to control resistant ryegrass Kevin Percy advises taking the affected areas out of crop production.

ryegrass species are very tough to manage.

"If you suspect resistance, get samples tested, although not all tests are based on the pot-test method which gives the best result for residual herbicides," he advises.

While reduced susceptibility to glyphosate has been confirmed in blackgrass, no cases of resistance in grassweeds have yet been identified in the UK. In bromes, instances of resistance to ALS and ACCase herbicides have been confirmed, but no cases of resistance to residual chemistry have been recorded.



Ryegrass plants with a high level of resistance to residual herbicides have been identified through testing.