




techtalk

Controlling septoria

Many farmers got to experience Corteva's new Univoq fungicide last year, but as the area treated with the innovative new chemistry increases in 2022, the company is committed to ensuring that knowledge and information is shared on how to maximise its potential in UK cereal crops.



“Septoria is an odd-ball pathogen.”

The unpredictable predator

Don't allow the last few years of low septoria pressure to lull you into a false sense of security – it's evolved into a greater threat than ever. CPM gleans expert advice on the pathogen and how to use new chemistry to keep it in check.

By Tom Allen-Stevens

Last season was tough for wheat growers. It started with very low septoria pressure and PCR testing revealed a very low threat from the disease right up until flag leaves emerged.

Then the weather changed, it turned warm and wet, and this showed that if you get the right conditions, septoria will rip through your wheat crop, if left exposed, notes NIAB crop protection and agronomy specialist Dr Aoife O'Driscoll. It's a challenging pathogen, and many varieties with supposedly good resistance didn't perform as they should, she adds.

This year new chemistry may help growers address the threat, though, says Mike Ashworth,

cereal fungicide product manager with Corteva Agriscience. But resistance management will be crucial to preserve efficacy against this predatory pathogen. Here they describe the challenges and best tactics for the season.

Why is septoria control challenging?

In comparison with most cereal diseases, septoria (*Zymoseptoria tritici*) is an odd-ball pathogen. Highly promiscuous, it adapts unbelievably well to the situation it's in. It reproduces sexually and will cycle several times in a season, transferring from leaf to leaf through the canopy by rain splash, especially during mild,

windy weather. It loves the UK spring-time climate and its wind-blown spores spread fast from field to field, farm to farm.

What's more, septoria has a long latent period of 11-35 days, typically two weeks, during which its hyphae will grow inside and explore leaf tissue leaving no visible trace of its presence. It is both necrotrophic and biotrophic, feeding on dead as well as live plant tissue. But while rust is the more predictable pathogen, mystery still surrounds the latent period in septoria, how long it lasts, how quickly it grows and its virulence when it starts to show. All these factors make it a huge challenge for wheat growers.

Septoria is the most important and damaging foliar disease on winter wheat. The dark lesions, peppered with characteristic small black pycnidia (fruiting bodies) will rob your crop of up to half of its potential yield. These pycnidia will survive overwinter on crop debris, making second or continuous wheats, especially susceptible varieties drilled early in low disturbance systems, most at risk. This rises the further you are to the wetter west of the UK.

How do genetics help?

Its ability to adapt, and for the nature of septoria populations is to

evolve and become more virulent, make control of the pathogen also a moving picture. Plant breeders have been highly successful at introducing multi-gene resistance into UK wheat varieties and one with an AHDB Recommended List rating for *Septoria tritici* above 5.5 is generally regarded as your first line of defence. Early sowing decreases the effective rating by 0.6.

But unexpected levels of septoria were observed in 2021 on varieties with a good rating. Pathologists believe genetics related to the wheat variety Cougar, currently prevalent in many popular varieties grown in the UK, do not confer the resistance they



Aoife O'Driscoll advises that a wise strategy is to grow as many as seven wheat varieties, drawn from different parent lines.

once did. Reliance on major gene resistance drives virulence and growers with just one or two varieties in their wheat portfolio expose these genetics to more virulent strains of septoria, which will multiply.

A wiser strategy is to grow as many as seven varieties, drawn from different parent lines, which could be in different fields or blends within the same crop. Having a sequence of growth stages between blocks also helps manage disease. Consider also the plant population — disease will spread faster in a full canopy than in a thin crop.

Nonetheless, the virulence of septoria will evolve faster than breeders can introduce new sources of resistance. This makes protection of genetics essential, and why a good fungicide strategy is important, not just for your crop, but for your neighbours and the industry in general. And just as it's important to have the latest genetics, so too will the latest chemistry help to keep in check the virulence of the septoria population.

What is Univoq?

Launched late last season, Univoq

contains fenpicoxamid, more commonly known as Inatreq active, and prothioconazole. Inatreq is a quinone inside inhibitor (Qil), which represents a new class of chemistry and a different mode of action (MoA) in cereal fungicides, targeting the respiration of fungal cells.

Inatreq is derived from fermentation of soil-borne treptomycetes bacteria to produce the antibiotic UK-2A. This is photosensitive, so a single-step process converts it to Inatreq, which naturally converts back to UK-2A in the plant and pathogen, providing the fungicidal activity. Importantly this includes curative activity on septoria.

Another component of Univoq is its formulation. Corteva's i-Q4 technology allows the product to collect in the wax layer of leaves and drip-feed through, lasting as long as six weeks following application.

Why is it needed?

Septoria has evolved to overcome some classes of chemistry, while SDHIs and all but the latest azoles have lost much of the potency they once had. This

means Inatreq provides vital curative activity, especially during the latent period, keeping disease in check, especially where spray timings are compromised and gaps between applications are stretched.

With its different MoA, Inatreq helps protect other chemistry, as well as your crop — tests have shown no known cross-resistance with other chemical classes.

What about resistance?

As a single-site active ingredient, there is a reasonable risk septoria will evolve resistance to Inatreq, so it's vital growers use it with an anti-resistance strategy in place. There are three aspects to this:

1. Univoq has a label restriction that it may be used only once during the growing season. This limits the exposure of the septoria population to the novel chemistry and allows any survivors to be controlled by other actives in the programme. Another consequence of this single application is that it naturally introduces alternation of MoA.



Just one application of Univoq per season is permitted, notes Mike Ashworth, best used at flag leaf, with rate matched to threat.

2. Inatreq may only be used in co-formulations or mixed with partner chemistry if provided as a twin pack. Univoq partners Inatreq with prothioconazole which remains one of the strongest azoles against septoria.
3. There's dose-rate flexibility to tailor applications to pressure. It's rare that the full 2 l/ha rate will be needed, with 1.25 l/ha the starting point for most situations. KWS Extase in East Anglia may be sufficiently protected with 1.1 l/ha, while a crop of KWS Barrel in Herefordshire could warrant as much as 1.5 l/ha. ►

Risk-averse strategy on septoria pays dividends

While there are some aspects of crop management you can often afford to take a chance on, controlling septoria in his wheat crop is not one of them, believes Andrew Mahon.

"I always think of the T2 fungicide application as an investment in crop insurance, and it's one aspect I'm particularly risk averse with," he says.

As farm manager of the 840ha Bromborough Estate Company near Wellingborough in Bedfordshire, Andrew has 700ha of combinable crops on heavy clay in a rotation of winter and spring wheat, winter beans, spring oats and linseed.

Crusoe, grown for Warburtons, is his mainstay wheat variety, with KWS Extase now introduced. Meanwhile a blend of Theodore and Costello is also in the ground as a look-see.

"Septoria is very much our number one disease threat, although it's a few years since we've seen high levels. Last

year, April was dry, cold and frosty and it wasn't until late May that growth picked up."

A keen advocate of on-farm trials, there's always a bit of new chemistry put to test on a few tramlines in Andrew's crops, and last year it was Univoq that came under scrutiny in a field of Crusoe, drilled in the last week of September.

"The loss of chlorothalonil is a big loss for us, but it's encouraging to see new products and especially a new mode of action. This adds appeal, rather than hammering away with the same chemistry that can build resistance," he says.

A T1 application of 0.35 l/ha Proline (prothioconazole) was applied at the end of April with trace elements and a biological brew. "It didn't look anything special, so I didn't think I'd push it too hard. The T2 was delayed by 5-6 days, applied on 25 May."

Elatus Era (benzovindiflupyr+ prothioconazole) was put on at 0.8 l/ha with 1.25 l/ha of Univoq on two tramlines as a comparison, both mixed with foliar potash, the biological brew and more trace elements. "The Univoq mixed well, and I particularly like the easy-pour can," notes Andrew.

PCR testing revealed disease didn't start to get going until the T3 timing — 16 June at which 0.6 l/ha of Aviator (bixafen+ prothioconazole) was applied. "I flew the drone up and you could see the difference — the Univoq area appeared to hold on to its green leaf better," he reports.

This was confirmed when the John Deere S790 combine, complete with weigh cells, gathered in the crop on 11 August. "We have mapping software that brings you live results from the combine and this picked out the tramlines. Our wheats usually average 9.6t/ha, with this field yielding 10.6t/ha.



Andrew Mahon's tramline trials produced a 0.3-0.4t/ha yield advantage where Univoq had been applied.

But there was a 0.3-0.4t/ha advantage where the Univoq had been applied," says Andrew.

"We had 75-80mm of rain at the end of the season last year, which stepped up the disease pressure over the previous year. Univoq gave a good result, and we'll be using more of it this year, whatever the risk, because the investment will be worth it against septoria," he concludes.



While a crop can appear free of septoria, it will travel up the canopy fast in the right conditions, which happened late in the season last year.

► Where does it fit?

The T2 timing, with flag leaf fully emerged, is the best place to use Univoq. A fungicide application at this timing protects the top two leaves of the wheat plant which contribute about 65% to yield, so it's worth using your strongest chemistry here.

Univoq's curative activity allows timing flexibility. So it helps in a catchy season or on farms with a high workload, where the T1 spray has been applied more than the standard four weeks before the T2. It then provides good persistence through until the T3 spray, and often beyond. Here, the priority may not be septoria, and the chemistry used is unlikely to be as strong against the disease. So the persistence of Inatreq assists the T3 in maintaining septoria control and the most effective option at

T2 will ensure the flag leaf stays green for as long as possible to feed the ear.

What do trials say?

AHDB 2021 fungicide performance trials suggest Univoq has a 0.25 t/ha advantage over Revystar (fluxapyroxad+ mefentrifluconazole) when used at two-thirds of the full rate. A similar average yield advantage was found across 36 trials carried out by Corteva in 2021 (see chart below).

NIAB trials carried out last year found Univoq was the best performing product at T2. Increasing the dose rate from 1 l/ha to 1.25 l/ha gave a significant yield response, but this was found to be a robust rate at the level of disease prevalent in the plots, with no yield advantage from increasing this to 1.5 l/ha. ■

Sponsor message

Corteva Agriscience is a world-leading agricultural inputs business focused on delivering the solutions UK and Irish farmers need to succeed.

Innovation is the foundation upon which Corteva was built with a renowned portfolio of robust, reliable products, which now includes its Univoq fungicide.

Innovation is often heralded as the solution to all the challenges facing farming.

In reality, it is just one part of the puzzle. What it does is bring together a whole raft of ideas and concepts from some of the world's brightest minds who are focused on creating something that makes a difference. Once these innovations arrive, it's important to understand how to get the most out of them; to take those tools and extract the maximum value.



Univoq comes in a new easy-pour can making it easier and quicker to keep septoria under control at the T2 timing.

Corteva will continue to work alongside its customers and in partnership with titles such as CPM to enable farmers to continue running profitable, thriving businesses for generations to come.

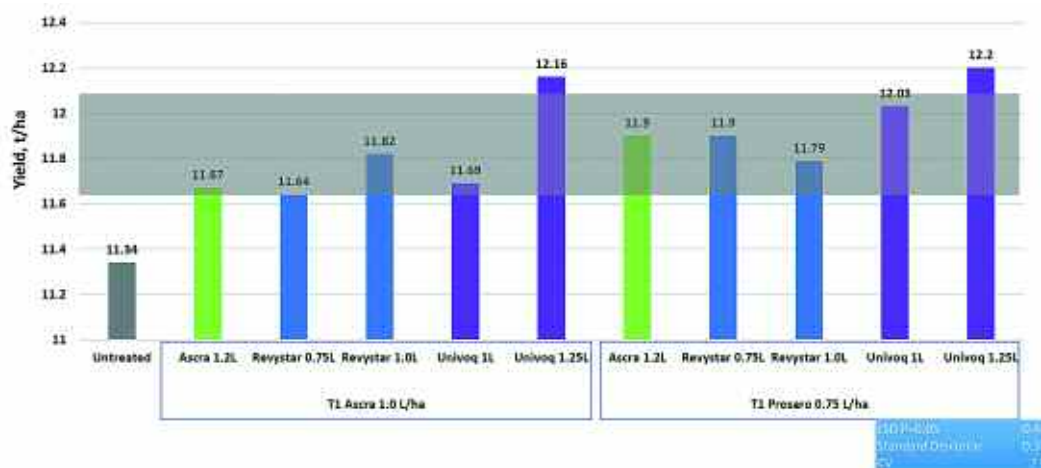
Performance of leading chemistry at T2 spray timing



Source: Corteva, 2021; Univoq @ 1.25 l/ha vs Revystar @ 1.0 l/ha; 30 trials show Univoq is better (green bars); 6 trials show Revystar is better (red bars).

Controlling septoria: top tips

- **Use plant genetics to keep the threat low** – Put a mix of as much as seven wheat varieties in your fields and don't rely on major-gene resistance.
- **Use a new mode of action at the T2 timing** – Trials show Univoq is most effective and helps protect other actives from resistance.
- **Tailor dose to disease threat** – Region, weather, drilling date, variety and crop canopy density will all influence the rate that's best.



Source: NIAB trials, Aky, Lincolnshire, 2021; cv KWS Extase; No T0 or T3 spray applied; Septoria infection @T2: L1-3 – 0%, L4 – 0.5%, 5 – 3.25% Aspra Xpro contains bixafen+ fluopyram+ prothioconazole; Prosaro – prothioconazole+ tebuconazole; Revystar XE – fluxapyroxad+ mefentrifluconazole; Univoq – fenpicoxamid+ prothioconazole.

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