



Product in focus

In a class of its own

As Revystar XE enters its fifth season of use, CPM takes a deep dive into the active ingredients in it to understand the journey so far and the science behind the product's consistent performance.

By Janine Adamson

Launching a new plant protection product into the market is no small feat — particularly when it includes an active ingredient which is the first of its class. It takes years of work and considerable investment to obtain regulatory approval, and now, approaching five years later, the success of Revystar XE stands firm.

At the heart of the product is Revysol (mefentrifluconazole) — an isopropanol-azole molecule which falls into the azole group of chemistry — in combination with SDHI Xemium (fluxapyroxad). It's used on wheat, barley, triticale, oats, rye and sugar beet to offer consistent control of a wide range of

diseases, mainly septoria, ramularia, rusts and cercospora.

But how did this success story begin? The starting point was screening molecules for pesticidal activity. "This takes place at BASF headquarters in Limburgerhof, Germany, where thousands of naturally-occurring and synthetic molecules are tested every year; every now and then we find one with promise," says BASF's head of registration for UK and Ireland, Jonathan Howarth.

Regulatory profile

"We first heard about Revysol as a team back in 2012 and colleagues were already excited about it because of its favourable regulatory profile. Back then we were part of the EU and the UK was nominated to evaluate the active on behalf of all member states, first submitting to the HSE's Chemicals Regulation Division (CRD) in 2016," he explains.

The evaluation was completed in 2017 but in the meantime, the UK had voted to leave the EU. "At this point we realised there was an opportunity to evaluate products using national processes, rather than the EU's zonal evaluation system, a separate procedure to registration of the active ingredient. It was a chance to get ahead of the EU and launch early

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into the UK," says Jonathan.

He believes this fast-track was a game-changer given fears time was running out for epoxiconazole, BASF's previous 'blockbuster' azole.

"The recently introduced EU pesticide regulation 1107/2009 was a hazard-based system, replacing the old risk-based legislation. With some established chemistry such as epoxiconazole in danger of being phased out, this meant a race to launch Revysol and associated products to avoid a gap for growers."

After much work and commitment from BASF's regulatory and R&D field-trial teams, Revysol came to market in 2020 — the same year that epoxiconazole was

phased out. “Regulatory hurdles keep getting higher so it was a huge effort across the whole company to push the new products over the line and achieve the first Revysol product authorisation in Europe,” explains Jonathan. “I remember in the early days being told Revysol stood for reliability, vitality and yield solution — it’s good to reflect back on that.”

According to Jonathan, the molecule has an advantageous regulatory profile because it’s effective at disease control in-field without compromise, yet is not an endocrine disruptor and has a favourable human health classification, which he says is rare for the azole group.

“Products have to be as safe as possible so it’s imperative that we are held to strict regulations — after all, it’s our license to operate,” stresses Jonathan.

Being a ‘sub-class’ of azole has proven central to the success of Revysol and in turn, Revystar XE. BASF’s Steve Dennis says although azoles have been used for nearly 50 years as a standard input to

control winter wheat diseases, they remain just as important. “Other modes of action come and go and differ in performance, to have something which remains so effective is quite amazing,” he says.

Sensitivity shift

Steve explains the class’ longevity is in part due to their slow, gradual shift in sensitivity rather than a severe step, as is the case with strobilurins. “Azoles aren’t immune to resistance issues but the change in sensitivity is less significant than for other classes.”

This is even more the case for Revysol due to the molecule’s unique ability to flex — its flexible ‘hook’ lets the molecule assume different positions, enabling it to bind to the fungal pathogen’s target enzyme even if mutations have developed. This gives the molecule a flexible chemical structure distinct from all other azole molecules.

“As a result, Revysol’s sensitivity to pathogens hasn’t changed despite



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entering its fifth year of use,” says Steve. “It’s an active which seems to have a high tolerance to resistance so is an important ▶

Cornerstone consistency

Having first used Revystar XE as part of pre-commercial launch farm trials around six years ago, Richard Budd of Stevens Farm (Hawkhurst Ltd) in Kent says the product has become a building block of his fungicide programmes.

Farming 1400ha, of which 1200ha is arable, Richard focuses his cropping rotation on winter wheat, winter barley, oilseed rape, winter beans and spring oats. The remainder of his business is top fruit production with some grassland for grazing agreements.

“Our rotation is a result of farming on Wadhurst clay which we’ve chosen to direct drill for the past decade or so, currently using Sumo DTS and DD direct disc drills. We chop all straw and return residues to the soil as well as applying a lot of organic manures and digestates,” he says.

It was being a part of BASF’s Real Results Circle from the beginning which meant Richard was given early doors access to Revystar XE.

“I always take the hype surrounding a new product with a pinch of salt but with Revystar XE, it actually worked.

“During this initial trial I applied it to a block of winter wheat which tends to senesce early down here due to our location in Kent. Having applied Revystar XE, it was noticeable that the crop stayed greener for longer which translated positively in yield,” he explains.

Richard recalls that around a similar time, he

felt as though fungicide options were dwindling and resistance management was becoming a greater conundrum. “But all of a sudden we had Revystar XE and the results could be seen with your own eyes, plus, backed by official ADAS trial data which is important.”

In terms of disease pressure at Stevens Farm, Richard says he’d always been under the impression that septoria wasn’t a problem. However, having conducted leaf tissue analysis, he was proven wrong. “The results showed that latent septoria was present, so I believe the disease is far more widespread than currently understood.”

He’s also seen a shift in climatic conditions as Kent becomes more unsettled, further increasing the risk of septoria and overall disease pressure. With risk on the rise, Richard stresses the importance of plant genetics in preserving vital chemistry such as Revystar XE. “The answer will never lie in a can, so it’s important to make careful varietal choices.

“It’s taking this hand-in-hand approach between genetics and chemistry which will help to preserve the plant protection toolbox and avoid abusing what we have,” he says. “This is vital because we have to avoid yield robbing latent septoria.”

Because seeing is believing, Richard has now made Revystar XE a consistent part of his fungicide programmes across the farm. And following the loss of chlorothalonil (CTL), he says



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more pressure is on effective T1 sprays.

“T0s can be difficult to get right now there’s no CTL. Also, having flexibility on timings due to the Xemium aspect of Revystar XE means the application window is slightly wider, which is particularly useful when leaf layer emergence isn’t consistent.

“Revystar XE is a building block for me — in high disease pressure years with dirty varieties we use it at T1, otherwise it’s my go-to for T2. In really difficult years we’ll use it at both timings,” he concludes.



Although azoles have been used for nearly fifty years as a standard input to control winter wheat diseases, they remain just as important, says Steve Dennis.

► tool for protecting other modes of action and creating diversity across a fungicide programme.”

When it comes to fungicide resistance management and septoria control, Revysol is perceived as a lower resistance risk active ingredient, says Jared Bonner. “It really does buck the trend — despite being highly efficacious, it has a high tolerance to resistance.

“Although in practice, Revystar XE is rarely used in the same tank mix as something like Inatreq (fenpicoxamid), it does help to support other integral actives when used elsewhere within a fungicide programme. Ultimately, if a best-in-class azole such as Revysol isn’t used somewhere in the programme, it places greater pressure on those active ingredients classed at higher resistance risk,” he explains.

Steve believes delivering a robust fungicide programme which considers resistance management is going to be even more essential this season given the sheer variability within crops.

“Crops are always irregular in regard to leaf emergence within the field but this year will be particularly inconsistent due to the autumn weather conditions. It’ll be especially challenging to identify the optimum moment to spray and hit the key timings,” he says.

However, a glasshouse study conducted by ADAS in 2022 evaluated the effects of fungicides on the speed of a disease epidemic. Leaves were inoculated with septoria spores the day after recommended rate fungicides were applied to ensure the fungicides were working in a protectant scenario. Revystar

XE was shown to slow down the visual symptoms of septoria by almost a week more than fenpicoxamid.

“Because the heart of the epidemic was decelerated, this meant additional green leaf tissue in the crop which is of course vital for photosynthesis and development. When you relate this to spray applications, it offsets the impact of those which aren’t timed perfectly, slowing the spread of spores to the new leaves and affording greater flexibility,” explains Steve.

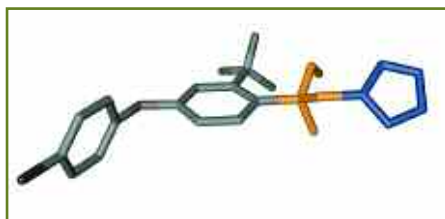
But, it’s not just effective at septoria control, which will again prove valuable this season due to the wide window of drilling dates and therefore, varying susceptibility to other diseases such as yellow rust and eyespot.

Broad-spectrum control

“It’s important to remember that Revystar XE is broad-spectrum. For those crops which have been drilled much later than usual, septoria risk will be lower, but, the chance of yellow rust could be higher,” says Jared. “Both Revysol and Xemium offer strong activity against yellow rust and brown rust, providing reassurance around early season disease considerations without compromising septoria control.

“Equally, if you consider a disease such as eyespot, prothioconazole has been the go-to azole as part of a T1 spray. However, both the Revysol and Xemium components of Revystar XE have been shown to offer at least as good, if not greater control than prothioconazole, providing a strong level of eyespot suppression across both strains. For the grower, this means there’s no reason to switch product if there’s risk of eyespot at T1.”

This versatility also presents itself in regard to crop approvals and practical application, with Revystar XE approved for use on all cereals, and as of last year, sugar beet. “Revystar XE can be used twice in a programme and offers excellent dose rate flexibility. For winter wheat, we’ve carried out numerous, robust



Revysol's flexible 'hook' lets the molecule assume different positions.



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dose response trials and recommend a 0.75 l/ha rate for the T1 timing and 1.0 l/ha at T2,” says Jared.

In barley, Revystar XE’s following has been steadily growing, he comments. “Revystar XE is well placed as a T2 solution, with the Revysol component delivering market-leading ramularia control, and Xemium proven as the strongest active for rhynchosporium control, while also improving straw quality”. ■

Product in focus

Revystar XE (Revysol+ Xemium) is a systemic fungicide with protectant and curative properties for disease control in wheat, barley, oats, rye, triticale and sugar beet.

Revysol is the only molecule within the triazole group where the triazole ‘head’ sits on the ‘neck’ of a flexible Isopropanol unit. This unique chemical structure allows the molecule to assume different conformations, resembling a ‘hook’. Due to its flexible ‘hook’, Revysol binds to the target enzyme up to 100 times more powerfully than conventional triazoles, also where target site mutations have developed.

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