

Saving on fungicides not an option

“It would be foolish not to employ the best tools for the job.”

Technical Disease control

As T1 timing approaches, programmes are likely to be geared as much to protect SDHI chemistry as to control disease. *CPM* gathers agronomists thoughts on T1 and T2 fungicide applications.

By Lucy de la Pasture

With grain prices low, it's a kneejerk reaction to cut back on inputs. In a low disease season, it could be argued that triazoles applied alone, with multisite inhibitors or as azole mixtures could be the way to save money, particularly with wheat at £100/t or thereabouts, says independent agronomist, Sean Sparling.

“But this is definitely not a low disease-pressure season,” he counters. “The growth of crops and diseases alike have carried on almost uninterrupted since last autumn, with septoria very easy to find and widespread within the canopies of most varieties.

“It comes as no surprise that the same resistant septoria mutation discovered in Ireland has now arrived in the UK — it was always just a matter of time before it blew downwind to us. Which is why it's even more important to protect the SDHI chemistry we have available and which is working well — for the time being at least,” he adds.

“The combination of the discovery of these new resistant strains and the high disease pressure, means it would be foolish not to employ the best tools for the job — SDHI, triazole and multisite fungicide mixtures,” he believes.

Total failure

Hutchinson's Dr David Ellerton agrees growers should adopt anti-resistance strategies now so that they don't get into the position of total failure that happened with the strobilurins.

“SDHIs are crucial to our fungicide programmes and it's vital to protect their activity. It's important not to overuse them in order to reduce selection pressure and to apply them at a rate appropriate to the disease pressure.

“Ideally growers should adopt a timely, preventative approach to keep on top of



The growth of crops and diseases alike have carried on almost uninterrupted since last autumn, says Sean Sparling.

septoria and avoid the disease getting established. But in high disease-pressure situations, such as experienced so far this season, higher rates of more expensive products such as SDHIs will be needed, even though this increases selection pressure on the SDHI chemistry,” he explains.

Clare Bend of Agrii says fungicides are arguably the most cost effective input and can make or break the profitability of a crop.

“Work carried out in the past by plant

pathologists has confirmed that the optimum dose rate of a fungicide is affected little by grain price until you get to the extremely low levels of £60-70/t. With grain prices where they are, the driver to reducing cost/t is yield. We've analysed our trials and the best fungicide programmes drive cost/t of production down, while maximizing margin over fungicide cost," she advises.

"Agri has been advising growers to move away from very septoria-susceptible varieties to those with better ratings, to reduce pressure on chemistry and cash flow," she adds.

Independent consultant Niall Atkinson reckons the present economics of wheat production require a much greater emphasis on all round cost control, with every potential input from a cultivation to spray application scrutinised.

"Choice of varieties becomes ever more important as growers look for better inherent septoria resistance," he believes, adding that careful variety choice forms the start of disease control programmes.

"I'll be looking to tailor disease control more specifically to varieties in the ground coupled with weather information and the growers' ability to react and cover the ground quickly."

So when it comes to what's going in the tank, is the backdrop of possible septoria insensitivity and low grain prices going to make a difference?

David Jones of CCC Agronomy doesn't think so. "It's easy to panic about the discovery of septoria isolates with reduced sensitivity to SDHI fungicides in Ireland and recently in the UK, but it shouldn't make any difference to our approach to septoria control."

Explaining his reasoning, he says, "We've known since the strobilurins were introduced

in the late 90s, that single-site modes of action are very vulnerable to resistance, and this is why as an industry we've had a strong focus on minimising this risk through sensible advice on fungicide use."

Worst case scenario

He agrees we should all be following the FRAC guidelines to try to prevent, or at least delay, the worst case scenario of widespread SDHI resistance. Using different modes of action, such as chlorothalonil (CTL) and triazoles with SDHI chemistry, keeping dose rates appropriate and, if at all possible, using fungicides in protectant situations will all help.

"SDHIs will continue to form the corner stone of my fungicide programs at the T2 timing. But with more septoria-resistant varieties, such as Skyfall and Crusoe, I'll be



David Ellerton says adopt anti-resistance strategies now to avoid total failure of the SDHI chemistry.

looking to use much less of the new generation SDHIs at T1 this year, if disease pressure allows," says David Jones. ▶

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Cutting back on fungicide spend in most years will reduce yield and increase cost/t, believes Clare Bend.

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Niall Atkinson will be tailoring his disease control more specifically to varieties in the ground.

► Early disease prevention will be vital this year to manage septoria effectively, believes Dr Paul Fogg of Frontier. “To achieve this, we’ve advised careful variety choice to reduce disease risk, which will now be followed by a ‘front-loaded’ programme to gain control early on but which can also be adapted later should disease pressure fall,” he says.

Robust levels

“T0 sprays were built around CTL and, given the rust pressure common in many varieties, a triazole is also likely to have been included. Timpani, for example, delivers robust levels of CTL and tebuconazole.”

ProCam trials show using triazoles with CTL at T0 is a good foundation for the programme, says Dr Tudor Dawkins, ProCam technical director. “Even the inclusion of cyflufenamid, where mildew is present, has helped control septoria as a side benefit.”

An important part of early Procam advice was selecting the right triazoles to use at T0. “It’s essential to ensure we don’t ‘condition’ the septoria population to adverse selection pressure to the azoles we want to use later,” he explains.

“Both tebuconazole and prochloraz have a role to play at T0 in association with CTL.

In years of high disease pressure, like 2014, we saw an extra 1t/ha of yield from this approach and this year looks very similar so far.”

The starting point for Steve Cook of Hampshire Arable Systems, was multisite CTL at T0, applied when leaf four was emerged. Explaining his rationale, he stresses the need to adopt a protectant strategy. “Septoria races have changed rapidly in the past few years to reach a point where triazoles no longer give reliable curative activity. The only real curative activity we have is from SDHI chemistry.

“The situation which will lead to the largest selection pressure for resistance is applying an SDHI in curative situations, because no other mode of action will help eradicate disease, so effectively it’s an SDHI on its own. The best way to protect SDHI chemistry is to try to keep control protectant.”

Sean Sparling believes strobilurins may still have a role to play in programmes. “I included CTL with a strobilurin rather than a triazole at T0, because reduced doses of triazoles, even at the T0 timing, can increase the frequency of resistant strains. I’ll also be adding CTL to my T1 to further protect the new growth of the canopy, as well as giving added protection to the triazole and SDHI T1 base.”

There’s general agreement that strobilurins, and pyraclostrobin in particular, is still giving some help on septoria in a protectant situation, as well as good rust activity. Paul Fogg says, “While strobilurins no longer have a strategic role in controlling septoria, we consistently see that the pyraclostrobin in Ceriax adds to the levels of control delivered by fluxapyroxad+epoxiconazole (as in Adexar) on its own. One possible explanation for this may be the germ-tube suppression afforded by pyraclostrobin as reported by Kildea et al. 2010.”

Sean Sparling plans to use SDHI plus triazole at T1 and T2 this season, the driver behind the decision being the high level of septoria in the field, but he

emphasises that full consideration must be given to protecting both fungicide groups.

Leading azoles

"That means applying a minimum 75-80% triazole dose, using one of the leading azoles such as prothioconazole or epoxiconazole with the recommended dosage of SDHI plus a multisite," he says.

Frontier programmes are also likely based on SDHIs at T1 and T2 given the amount of disease potentially threatening yields, reckons Paul Fogg. "T1 options will be either penthiopyrad (Vertisan) plus Manitoba (epoxiconazole+ folpet), or Ceriax plus CTL. The Vertisan mix works well, as the straight SDHI gives us some dose rate flexibility based on disease pressure at this stage and Manitoba adds the essential multi-site, as well as an 80% dose of epoxiconazole."

David Jones believes Keystone (epoxiconazole+ isopyrazam) could have a useful role at T1 in more septoria susceptible varieties in a protectant situation this season, offering cost-effective protection with a robust dose of both SDHI and triazole. Where he judges disease pressure doesn't justify the expense, a minimum of a 75% dose of epoxiconazole and 1 l/ha of CTL will form the basis for T1 septoria protection. Boscalid and strobilurins will be brought in where eyespot and rusts are also a risk.



Paul Fogg advocates a 'front-loaded' programme to gain control early on, which can also be adapted later should disease pressure fall.



David Jones doesn't believe the discovery of SDHI resistant septoria isolates should make any difference to the approach to septoria control.

That's the sort of approach Niall Atkinson concurs with. "If conditions at T1 are favourable towards septoria development and timings are compromised, then robust rates of SDHI will be required. But if conditions for disease development are low and timely applications can be practiced, then cheaper azoles, at a robust rate, together with CTL will be an option giving good protection through to T2."

For Steve Cook, T1 applications will be timed at leaf three just fully emerged and will include an SDHI plus triazole and CTL. "Triazoles will be important in the program to keep the protectant element as high as possible. I'm considering CTL on leaf two because this is the leaf which will be most vulnerable, possibly relying on eradicator activity to keep it clean, so a protectant added when leaf two is just emerged will help," he reckons.

"There's also evidence that CTL will reduce eradicator activity of the SDHI, so moving the CTL to an earlier timing could help. This may mean an extra pass but could fit with a late growth regulation application," he suggests.

In Clare Bend's opinion, strategies should be a mixture of two or three modes of action at T1, depending on risk. "At T1, inclusion of an SDHI is important where disease risk is high, as omitting a T1 SDHI only exposes the T2 SDHI to greater curative pressures," she reasons.

"At T2 inclusion of an SDHI is ▶

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Select the right triazoles to use at T0, points out Tudor Dawkins, to ensure the septoria population isn't 'conditioned' to the azoles you want to use later.

► essential, with the top three SDHIs, based on our data, being fluxapyroxad, bixafen and penthiopyrad. Adding multi-sites — both folpet and chlorothalonil as each has strengths and weaknesses — will be at the core of strategies," she explains.

These should be applied two or three times in the season, depending on disease threat, but most particularly at T0 and T1. "We're reluctant to include CTL at T2 if bixafen (in Aviator Xpro) is to be included as the SDHI of choice, because of antagonism, although the extent of this appears to vary between formulations, while folpet seems fine as a mixer. Imtrex (fluxapyroxad) with CTL doesn't seem to be an issue," she notes.

According to Agrii trials, formulation is as important as selection of the rate of active ingredient applied, and can make a big difference, believes Clare Bend. "Leaves are difficult to penetrate and, unless you can get the active ingredient to the target site effectively, you won't get the most from the products you're applying."

Good formulation

Imtrex is a particularly good formulation, she adds, and when put with a good triazole formulation, such as Brutus (epoxiconazole+ metconazole), easily and consistently outperforms Adexar.

"Some formulations can be improved by using a separate adjuvant, especially where the target is challenging. Ear disease, brown rust low in the canopy and high application speeds are examples," she suggests.

Using an SDHI plus azole at T2 is a given, with every agronomist believing there would have to be a particularly good justification for omitting the combination at this timing. But what about how the azole should be used within the program?

Clare Bend says that Agrii advise both stacking and alternating triazoles as strategies. "With the plethora of azole-resistant strains out there, susceptible to a greater or lesser degree to different azoles, keeping septoria guessing must be the name of the game," she says. "We know that continued use of the same azole in a programme effectively selects a population resistant to that azole."

"Triazole formulation is important too — the yield benefit of stacked azoles such as Kestrel/Prosaro (prothioconazole + tebuconazole) and Brutus were backed up by HGCA AFD data when the products were first introduced. What we've found is that the benefits over single azoles have increased over time, from +0.2t/ha in the mid 2000s to +0.8t/ha now. We think part of this is the better formulations but also because we're hitting septoria with a blend of two azoles. Switching from one azole mix to another at each fungicide timing is important," she stresses.

But David Jones doesn't completely buy into that approach. "I'm less convinced by azole mixtures; having reviewed the

science from a range of researchers over the winter and from the AICC own trials data, I believe that mixing triazoles neither reduces resistance risk or markedly improves disease control — however key triazole (epoxiconazole/prothioconazole) rotation within a T1/T2 programme is potentially a sensible strategy," he believes.

Frontiers achieve this by basing T2 sprays on either robust rates of Skyway Xpro (bixafen+ prothioconazole+ tebuconazole) or Ceriax (fluxapyroxad+ epoxiconazole), with or without CTL (depending on what was used at T1), explains Paul Fogg. "Using Skyway means we can alternate SDHI activities and also brings in a further triazole in the form of prothioconazole."

Tudor Dawkins emphasises that protection is the name of the game and T2 mixtures must be designed to protect yield-generating leaves. "ProCam trials have again demonstrated the benefits of using triazoles, strobilurins and SDHIs in combination, to achieve this. If disease pressure is less, as in 2015, it's better to fine tune doses at this stage rather than drop actives from the programme altogether," he adds.

Steve Cook says his T2 fungicides will be SDHI plus triazole again and maybe a further CTL addition if well timed. But if it's delayed, the CTL will be left out and doses of SDHI increased. "T3 fungicides will be timed for fusarium protection and will include further triazole to top up septoria protection."

Sean Sparling sums up the danger to SDHIs: "Overuse, reduced rates and poor protection of the SDHIs will lead to a rapid rise in resistant isolates in the field, so no more than two SDHIs should be applied in any one growing season. We may be fighting a losing battle with resistance, but while these products are still working, we have to look after and protect them for as long as we can — hindsight is no good to anyone." ■

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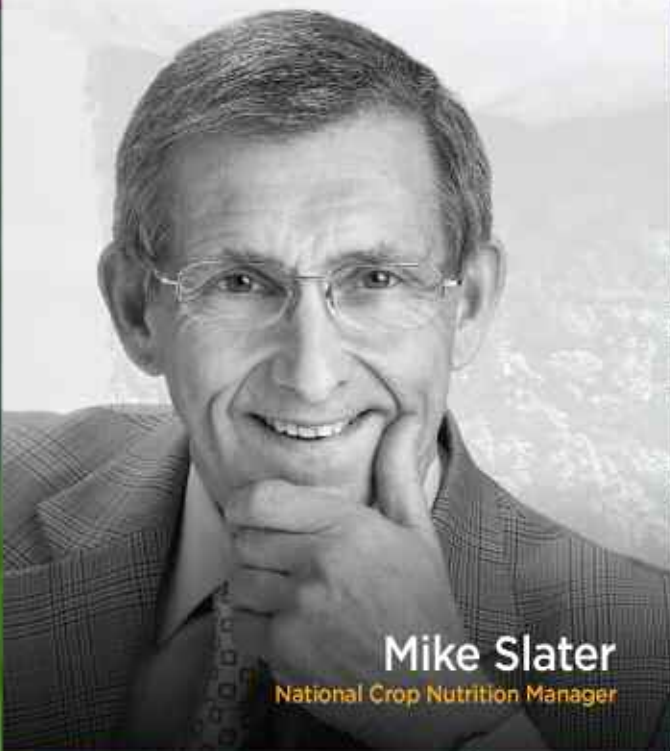
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