

Resistance management starts today



“We’ve undertaken modelling work where we see that by using mixtures and alternating, it’s possible to extend the effective life of a fungicide from 10 to 20 years.”

MIKE GRIMMER

Cereal crop disease management and mitigating potential resistance concerns begin the moment a variety is selected and planted in the ground. *CPM* opens up the discussion early for this month’s *Common Ground*.

By Janine Adamson

In the face of ever-shifting disease threats, particularly in regard to septoria and yellow rust, is resistance management adequately factored into disease control decision-making? Equally, what can actually be done to protect key active ingredients for the season ahead?

To explore this topic further, *CPM* brings together Devon-based independent agronomist, Arthur Marshall; ADAS crop disease

principal consultant for crop disease management, Mike Grimmer; and BASF’s business development manager for cereal fungicides, Jared Bonner.

ATTITUDES TO RESISTANCE MANAGEMENT

To begin, the group broached the subject of whether growers and agronomists are proactively considering resistance management when planning cereal crop fungicide

programmes. In Mike’s opinion, they are.

“There’s certainly a degree of engagement from growers and agronomists, but we also have to recognise they have many other competing aspects to think about as well; it has to work economically.

“I guess it’s about getting a balance where disease control is achieved at a reasonable cost, but subsequently there may be some tension between that and the very best resistance management practice,” he explained.

Arthur added that in his case, due to significant septoria pressure and resistant isolates across Devon, he makes it a major priority. “The industry is really on board with it, but the problem is there can be a reliance on partner products that aren’t quite up to it. So in my



Competing priorities

ADAS' Mike Grimmer believes there's a degree of engagement from growers with resistance management, but a herbicide programme has to work economically too.

opinion, that's the only failing."

The rapid loss of strobilurin performance against septoria in 2003 remains a salutary lesson – a single target-site mutation drove a sudden step-change in resistance across the UK population. "We only have to look back at what happened with the strobilurins on septoria," said Jared. "They went from being a cornerstone of septoria control to losing that facet remarkably quickly."

Jared then noted that contrary to herbicide resistance which is a constant concern, he believes fungicide resistance isn't necessarily treated the same. "It goes in waves of how much people think about it. It's reassuring that people are talking about it more now, in response to recent events such as the YR15 yellow rust break down in wheat and conversations regarding the performance of new SDHIs. Those issues have brought fungicide resistance management back into people's minds a little more."

In response, Mike highlighted that companies such as BASF as well as academics and researchers have a duty to ensure the correct messaging is shared across the industry. "We can't simply expect growers and agronomists to do the right thing, and guess what that might be. We have to make it very clear what the best practices are and support them in that."

CURRENT CONCERNS

For Jared, an alarm bell was raised at AHDB's conference last year where work was presented that suggested two recently introduced SDHI fungicides – isoflucypram and pydiflumetofen – had high levels of selection for insensitive isolates.

"If you consider pydiflumetofen on the fungicide performance curves, it's giving good septoria efficacy; if you're controlling the highest level of septoria, then it makes sense that you'll begin selecting for insensitive isolates. Subsequently, the advice has been not to sequence those two new SDHIs in the same programme and look to bring in alternative modes of action.

"This is nothing new – diversity in modes of action is one of the best ways to mitigate the threat of fungicide resistance, whether that's in the tank or across the programme. Also paying careful attention to what those key actives are partnered with, and aiming for a balance," he urged.

"If you have one active ingredient doing a lot of the heavy lifting partnered with another doing much less, how much are they protecting each other in reality? It's not saying don't use those new SDHI actives, but it's making sure we look at where they're being used and ensuring a full programme is developed accordingly.

"When mapping out potential fungicide programmes, it's important to consider resistance risk profiles early in the season, so as to not limit your options by the time you get to your T2 or T3 applications. Use of a broad-spectrum, lower resistance

risk active at T1, such as Revysol (mefentrifluconazole), allows you to keep your options open at T2, both in terms of resistance and disease pressure."

Mike added that being single-site, both isoflucypram and pydiflumetofen will exert a selection pressure on the septoria population. "Simply, if you use them both/twice, you're exerting more selection pressure than if you use them once."

CULTURAL TACTICS

To continue, Mike raised the topic of cultural tools. "What we can start thinking about even now coming into the autumn, is what sort of crop do we want to have next spring and how much disease do we want in there? If we drill a little later, chances are there'll be less septoria next spring than if we drilled earlier.

"Also, variety choice is important because potentially that's a useful way of slowing resistance development, almost like adding in an extra mix partner to your programme to relieve some of the pressure on the big hitting chemistry, as well as creating flexibility in timings and doses.

"Anything you can do that reduces your reliance on single-site chemistry will help resistance management," he urged.

Arthur said in his region, it's important to avoid varieties with scores below 6.5 for septoria resistance. "In the old days when products were doing a brilliant job, we didn't have to worry about genetic resistance.

"But since the situation has changed, we can't rely solely on chemistry and require adequate genetic resistance. However, this doesn't mean you can



Warning signs

For BASF's Jared Bonner, an alarm bell was raised at AHDB's conference last year where work was presented that suggested two recently introduced SDHI fungicides had high levels of selection for insensitive isolates.



Flexible options

There's potential with some products to mix and match the partner, for example, changing from prothioconazole to a Revysol base.

- ▶ reduce fungicides; you want a belt and braces approach to support both the genetics and the chemistry."

Circling back to drilling date, Arthur explained that in reality, it's agronomist versus the farmer. "If growers do drill early then there'll likely be more septoria and more virus. September is 'out' for us in Devon because it's quite mild; the first week in October would equate to the middle of September for the rest of the country.

"In fact, this past autumn, our best crops were drilled in November, while the year before, a lot didn't get sown because October was wet. That's the trade-off. But where septoria is concerned, late drilling is a good way to back up your fungicide programme."

BEST PRACTICE

Thinking about tactics for chemistry use, Jared re-highlighted the importance of integrating alternative modes of action across a programme. "There's the potential for some products where you can almost mix and match the partner, whether that's a multi-site or perhaps reconsidering the exact azole being used. For example, changing from prothioconazole to Revysol base.

"It's looking at the whole programme, the modes of action and how these can be utilised to create a robust

approach. Asking questions such as where are we going to get the best from the actives? Do they need support, and what does that look like?"

Mike agreed: "If we're using prothioconazole and Revysol in the programme somewhere too, then they're exerting slightly different pressure on the pathogen populations. This is because there's only partial cross resistance that we've seen between those two active ingredients."

Arthur noted that while there's been a trend to move away from multi-site chemistry, he believes it still offers value.

"I think many of us thought when the new products came in that we wouldn't bother with multi-sites, rather spend the money on a higher rate of Revysol or pydiflumetofen. But evidence is accumulating that we ought to still use multi-sites."

It's also looking at the disease present when considering SDHI use, highlighted Jared. "Xemium (fluxapyroxad) is an older SDHI which presents lower septoria efficacy, but offers very good rust control. Therefore it's not only understanding the fungicide families, but also the strengths of the actives within."

THE FUTURE

Jared raised that there are some new active ingredients on the horizon which appear to be offering good septoria and rust activity. "However, we must maximise their life span as well as the longevity

of the products we already have.

"For example, Gilboa (flumetysulfurim), which both Adama and BASF will be marketing once registration comes through, subject to approval, is anticipated to arrive for use next season.

"This is important because it's a brand new mode of action for cereal fungicides in the UK. Being new, this will be really beneficial to growers, but now we have to look at how we successfully integrate that into a programme including what's partnered with it."

Mike urged that mitigating fungicide resistance has to start from the moment a new product arrives.

"We've undertaken modelling work where we see that by using mixtures and alternating, it's possible to extend the effective life of fungicide from say 10 years to 20 years.

"Conversely, if you introduce good

resistance management later in a product's life cycle, you're reducing that benefit by quite a lot. This is why we all have to work together and use good resistance management tactics from the start, rather than waiting until there's a problem and then thinking about it."

Arthur pointed out that he's fully aware that the NPD pipeline is limited. "You can't keep expecting new actives to arrive, but there are a couple coming and I think that will help us. Regardless, resistance is a serious problem and I think any really effective product is only going to have maybe ten applications before it goes," he concluded. ●

"It's looking at the whole programme, the modes of action and how these can be utilised to create a robust approach."

COMMON GROUND

BASF's Common Ground is a community united by shared vision – a brighter future for farming. Working together to tackle the challenges growers face while celebrating the opportunities that arise, the initiative brings together people and businesses with diverse farming philosophies to share their perspectives.

By exploring key topics such as resilient crop production, achieving balance, and preparing for tomorrow's demands, it highlights the power of collective insight. In coming together to openly discuss and face challenges as one, Common Ground can discover what truly works and help shape the future of UK agriculture.

CPM would like to thank BASF for sponsoring this feature and for its support in making the connections to the experts and insights required to make it possible.

BASF
We create chemistry