Potato agronomy

Perils in potatoes

With an ever complicated story for potato late blight, optimising tools such as varietal resistance and industry monitoring services could help growers to manage the threat. *CPM* finds out more.

By Mike Abram

Varietal resistance to blight should be a useful tool for growers to help manage the disease in the face of the challenges from resistant strains, but there are concerns over the validity of resistance ratings as well as commercial pressures on variety choice.

Late blight varietal resistance testing is carried out by SASA (Science & Advice for Scottish Agriculture) on new varieties using an isolate of EU_13_A2, but once completed isn't routinely revisited as blight strains change which potentially leaves a hole in the information which growers and advisers are basing strategies on.

Cultivar-based integrated control of blight isn't really being considered or used widely by the industry, suggests ADAS potato pathologist Dr Faye Ritchie. "Practically, that could make a big impact in terms of the risk of blight to a crop."

Applying less of a particular fungicide active will reduce selection for fungicide insensitive strains, she adds. "Recommending mixtures is right given the current risks, but there's potential to go further — using varieties with better resistance would increase opportunities to use reduced rate mixtures. The safest way to do that is to increase the resistance of your potato cultivar.

"There's always the question around who carries the risk and the liability for using reduced rate mixtures, so evidence that these strategies would work is required.

Alternative approaches

"Given we've seen the appearance of fungicide resistance to several modes of action in a relatively short space of time, and the cost implications associated with managing this risk, it would be a good time to be thinking about alternative ways to manage blight," she suggests.

Even where more resistant varieties are being grown on farm, most growers use the same blight programmes regardless of variety, says SAC senior potato consultant Kyran Maloney. "If we had a little more confidence in the resistance ratings and a bit more willingness to manage in a slightly different way there might be more room for manoeuvre."

Indeed, according to Agrii's Nick Winmill, at least two seed houses are no longer willing to stand by varietal blight resistance scores of their new and establishing varieties based on the uncertainty over the ability of those genetics to withstand the new strains. "Part of the challenge with new resistant varieties is acceptance in the marketplace," says Nick.

Growers don't have much choice in what variety they grow, agrees Midlands-based independent potato agronomist Mark Taplin from Harvest Agronomy. "It's typically pulled through by customers."

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Blight resistance has also not been high on breeders' lists of priorities, suggests Norfolk potato agronomist Simon Alexander. "It's not surprising — when

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Mark Taplin says he's taking a cautious approach using robust programmes involving mixing multiple modes of action.

you look at cereals there's a handful of important traits to breed for, but in potatoes it's easily 30 or 40 traits.

"There are so many things to aim for, and the problem is relying on conventional breeding even with the use of markers etc, you have constraints on what you can breed for. And for me, PCN is probably something I'd rather have resistance for because controlling that is probably under even greater pressure."

This discussion is prevalent because as far as is aware, resistant blight strains EU_43_A1 and EU_46_A1 that caused problems for Dutch growers last season haven't reached the UK yet.

But with a couple of isolated cases appearing in Ireland in August last season, it's difficult to know what will happen this season, making it much harder to plan blight control programmes that marry the sometimes-competing objectives of efficacy, resistance management and cost.

"There is a threat," stresses Dr David Cooke, James Hutton Institute potato pathologist. "There are now lineages with resistance to fungicides including, worryingly, one with double fungicide resistance."

The fact that double resistance is to two of the key groups of blight fungicides — the widely used carboxylic acid amides (CAA) which includes actives such as mandipropamid, benthiavalicarb and dimethomorph, and the oxysterol binding protein inhibitors (OSBPI) which currently consists of Zorvec products containing oxathiapiprolin, the most active blight fungicide active available — makes the situation even more concerning for growers and agronomists.

"Both groups are fundamental to blight control," says David. "Resistance appearing to both in quick succession is a concern."

There are also reports of isolates of EU_36_A2 collected in Denmark and the Netherlands with resistance to OSBPI fungicides. However, David can't recall a new lineage of the blight pathogen which has originated in the UK, emphasising they generally arrive either on the wind or being imported on seed.

Chief among the reasons why the UK isn't the source of new strains is the industry's adherence to resistance management strategies — the use of formulated products with more than one mode of action, mixing and sequencing. The UK has been helped in the past three seasons with continued access to mancozeb, unlike farmers in the EU.

Assume the worst

But with the Irish finding of EU_43_A1 in the 2023 season, David suggests programmes should be adapted, assuming the worst. For resistance management, that means mixing at least two modes of action in every spray, and/or using strict alternation of at-risk modes of action through the season.

"We have good evidence about resistance management strategies," continues Kyran. "Mixing is most important followed by alternation and also reducing exposure of the chemistry, where possible, although that's not an option when you're concerned about outbreaks."

Testing any outbreaks and especially where there's been product failure will be crucial in 2024. For both CAA and OSBPI fungicides, the mutations causing resistance are known which makes testing for presence relatively straightforward.

But financing those tests is another matter — since the discontinuation of AHDB Potatoes funding for the Fight Against Blight (FAB) service led by James Hutton Institute has been an annual battle. Last year, funding amounted to £130,000 provided by 16 sponsors for testing of around 100 outbreaks.

The aim will be a similar amount for this season, says David, although tracking whether a particular strain carries the resistance mutation isn't costed into FAB. "The Hutton Institute will always do what we can to protect the industry, and particularly if we get early outbreaks of EU_43_A1 we'll want to know whether they're resistant or sensitive to key fungicides.

David Cooke says the Hutton Institute will always do its utmost to run Fight Against Blight, but it's difficult to promise without secure funding.

"We would always do our utmost to do these tests, but it's difficult to promise without secure funding," he stresses.

A better finance model for FAB is urgently required, says Simon. "If ever there was an argument for improved funding to analyse more samples and get more information back as to what's happening in the field today, this is it," he says. "It's totally absurd they have to go round with a begging bowl every year to fund it."

It's the type of information farmers and agronomists will require to help walk the fine line between minimising fungicide use and cost, while maintaining efficacy and protecting against resistance.

A strategy that considers the risk of new strains and follows best practice guidelines of mixing more than one mode of action will cost around 33% more than typical programmes used in the past couple of seasons, where single modes of action, alternated, were more the norm.

Furthermore, that cost will likely rise by at least 5-6% once mancozeb is out of the equation. From a practical point of view, it's not easy to pick your way through the competing factors of resistance management, cost and efficacy, continues Mark.

"It feels hazardous to try when you know these strains are likely to appear at some point. Why would you put the crop at risk?" he says. "But my fear is we could end up massively overapplying fungicides, which might be the right thing to do [if resistant strains are present], but equally could turn out not to be this season.

"As someone writing recommendations, how do we tread that path of not just over-reacting to perceived risk and not over applying fungicides?" he asks.

Simon agrees this is a challenge. "It's difficult because as an industry we're ▸

According to Simon Alexander, adding localised spore trapping data would theoretically improve the accuracy of forecasting models.

▸ under a massive amount of financial pressure. I'm not prepared to be accused of over-applying — the older I get the more I hate writing a recommendation — as much for the environmental aspect of using chemistry. But I'm also not a gambler."

Both Mark and Simon say they're in a quandary about the best way to construct programmes this season.

Mixing modes of action

Mark explains he's likely to be cautious and use robust programmes involving mixing multiple modes of action. "Once you've decided there's sufficient risk to justify a treatment, you have to protect yourself against the possibility the new strains might be present even though they've not been found yet.

"At some point they will be, so that has to be a mixture of at least two modes of action, whereas last year we were quite happily using and alternating single modes of action."

Simon is more undecided, seeking further confirmation of the resistant strains being in the UK before changing, at least completely, to a mixed mode of action strategy.

"Currently we don't have those strains in the UK, and [historically we have shown] we aren't at risk of selecting any strains out that are resident in the UK for resistance [by following good practice of alternation and appropriate mixing]," he says. "So I'm torn on what to do."

If one of those resistant strains was to be confirmed in the UK, it would be easier to justify making changes, he says, but until then, he's more likely to continue making considered risk assessments that mean using multiple modes of action at some points, but not necessarily all.

Both will continue to use forecasting tools such as Hutton periods, BlightSpy and BlightCast to give an understanding of whether weather is conducive for infection.

Further development of the models would be helpful though — while better weather forecasting beyond three days is perhaps asking too much of model developers, being able to use actual weather for the past 14 days to understand whether there was a risk of blight rather than what the forecast risk predicted would be helpful, explains Simon.

"Currently none of the models do this either because of model design or funding constraints, although Syngenta is working on including it in BlightCast," he acknowledges.

Adding in localised spore trapping data, theoretically, would also improve model accuracy, although previous attempts to make this work were unsuccessful, adds Simon.

Smarter use of tools could potentially help manage costs by helping to pinpoint when intervals could be safely extended, adds David. "If the weather is dry and you're on top of primary inoculum, knocking out dumps and keeping an eye on volunteers you can extend intervals, which is a logical way of reducing costs and chemistry.

"But growers and agronomists will only do that with confidence when the conditions are extremely dry and inoculum is absent."

For Kyran, that could mean rethinking programmes where applications are on fixed intervals. "Sometimes those applications won't be at an optimum time based on the weather and when blight periods are. I think growers shouldn't be too scared about that — it's more difficult to manage but getting a bit smarter about when applications happen could be beneficial to control," he concludes. ■

New blight fungicide

In response to potentially having to mix CAA fungicides with another mode of action to help protect those actives against new strains, Syngenta has launched Evagio Forte for the coming season.

The product co-formulates its CAA foliar blight active ingredient mandipropamid with amisulbrom in what Syngenta claims is an optimised formulation, maintaining overall efficacy of blight programmes while adding a valuable anti-resistance strategy.

Registration trials have proven Evagio Forte delivers effective blight control at a reduced overall loading of mandipropamid and amisulbrom, compared with the rates recommended for the two individual components, says Andy Cunningham, Syngenta technical manager.

"That's important for agronomists and growers looking to minimise overall fungicide active application in the blight programme, especially when using mixes of solo products to tackle resistance concerns.

"Without the evidence of such specific efficacy trials, it's always recommended to use the full rates of any blight fungicide, even when used in a mix with another product," he stresses.

Growers can use three Evagio Forte applications in blight programmes from first flowering at a rate of 0.6 l/ha. For optimum resistance management, it should be alternated with a blight application containing actives from different modes of action.

"It's crucial to take a precautionary approach, utilising more blight spray mixes and alternating chemistry modes of action to minimise the risk of any issue developing," says Andy. "Evagio Forte provides an important additional option to bolster that approach."

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