

A strain on the future

Forward-thinking farmers

Seed shortages, mancozeb uncertainty and more resistant blight strains are set to compound the difficulties caused by one of the wettest autumn and winter periods on record. *CPM* reports.

By Rob Jones

Potato growers are facing more than the usual array of challenges this season. Of greatest concern is the spread of late blight strains with multiple resistance to two widely used fungicide groups and the difficulties these will create in delivering season-long protection.

Virus too is set to present an unseasonably high risk to crops. The area of Scottish seed crops infected with potato leaf roll virus (PLRV) has been steadily increasing. It's now the dominant aphid-borne virus found in symptomatic leaves by inspectors at 55.5% of cases, while the relative incidence of Potato Virus Y (PVY) has fallen to 36.3% in 2023 from 51.8% the previous year.

Seed certification schemes have done much to reduce the chances of infected seed being sold to commercial growers, but the greater issue is that the peach-potato aphid, the principal virus vector, is widely resistant to pyrethroids and there are constraints on the timing and application of systemic insecticides.

In the place of early season pyrethroids, regular applications of mineral oil, typically in the form of Crop Spray 11E are commonly practiced, though fluazinam-containing products and the oil dispersion (OD) formulation of certain fungicides has been found to react adversely with this product, increasing the risk of phytotoxic symptoms.

Integrated approach

To reduce reliance on insecticides, growers have been encouraged to use straw mulch, purge and wildflower strips within early seed generation fields. Where these measures have been deployed separately, success has been variable. But deployed in combination, the evidence suggests these actions have been sufficient to deliver the high level protection required.

The emergence of 43_A1, a late blight strain demonstrating resistance to CAA fungicides such as mandipropamid, bentiavalicarb and dimethomorph, as well as the OSBPI fungicide oxathiapiprolin, has raised concern across the industry.

A second strain 46_A1, is also believed to be resistant to the OSBPI fungicide oxathiapiprolin, as in Zorvec Endavia (bentiavalicarb+ oxathiapiprolin), though this is yet to be publicly confirmed.

The development of more resistant strains raises questions. Not least, how should fungicide programmes be adapted and what about the cost? For the 2024 season and most likely the 2025 campaign, the threat these new strains pose is partly covered by the continued availability of mancozeb.

How protection will be achieved without this fungicide however, is a question to be

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answered. On their own, such growing challenges could be sustained, but all at once? The danger to farm profitability and business confidence is painfully apparent,



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believes Eric Anderson, senior agronomist at Scottish Agronomy.

“Across Scotland, England and continental Europe, seed availability is greatly reduced. Belpotato.be, the trade association for Belgian potato sector, reports that the seed area across Belgium, Denmark, France, Germany and the Netherlands was down 7% in 2023 compared with 2022 volumes. The crop has also suffered from poor yield and quality issues which will further exacerbate supply issues,” he says.

“As a result, any available seed is likely to be planted regardless of size, while there are some who are preparing to re-plant progeny from ware crops because they either can't source the required seed, or can't afford the cost.”

Eric says undoubtedly, this will raise the environmental virus inoculum this season but it's the threat to crops posed by 43_A1 and 46_A1 that concerns him the most. Specifically, he fears the high incidence of foliar and tuber blight in continental seed and a likely shortfall in British seed means there's a real risk of importing 43_A1 into England via latent infection.

This raises concern that if anti-resistance strategies aren't followed from the outset, where infected seed is planted, it could allow the genotype to gain a foothold, he stresses.

“The tolerance for tuber blight in Basic seed potatoes and Certified seed potatoes produced in England is 0.5%, and about one in 200 blighted tubers will typically still emerge after planting,” explains Eric. “At average planting densities, that could result in one or two blight foci per hectare.

“The damage inflicted to crops across Europe last season should worry growers. The Netherlands recorded the highest blight pressure for 30 years in 2023 where populations were dominated by 43_A1. Although overall it comprised 25% of the 2023 samples in Europe, to date it's locally higher — for example, 55% (n = 467) in The

Netherlands, 52% (n = 115) in Germany and 36% (n = 250) in Belgium.

“Conversely, it fell from over 64% in 2022 to 24% (n = 113) in Denmark last year after new application guidance was adopted, and it wasn't reported at all in the UK. A single sample was, however, found in Ireland which may be a cause for concern and is under investigation,” he says.

EU 46_A1 is related but is sufficiently different from 43_A1 to be given its own name, explains Eric. Since 46_A1 wasn't annotated by EuroBlight before 2023 and it accounted for about 10% of the Netherlands population last season, its rapid spread is likely to be related to inappropriate fungicide selection pressure.

Crop losses

He says 46_A1 was widely reported in the starch producing areas of northern Netherlands — poor late blight control alone is reckoned to account for at least 10% of the overall crop losses in the Netherlands during 2023 and the impact of 46_A1 has also been felt in northwest Germany.

It's understood that the issue caused by these new genotypes relates to the use of CAA fungicides (FRAC mode of action group 40) and OSBPI fungicides (FRAC mode of action group 49) — see table. CAA fungicides typically make up the bulk of most blight programmes, so the emergence of a strain resistant to this group of products will leave a gap in protection.

FRAC guidelines in regions with reported cases of resistance states that CAA fungicides must be used in mixtures, with no more than two consecutive applications.

OSBPI fungicides, of which there is currently one approved active substance in oxathiapiprolin, are used extensively during rapid canopy. Zorvec Endavia contains both CAA and OSBPI active substances.

Whereas new best practice guidelines from Corteva suggest sprays containing Zorvec shouldn't exceed 20% of the total number of sprays to a crop and should be



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tank-mixed with mancozeb to add a third mode of action, if 43_A1 or 46_A1 are at risk of being present.

The FRAC OSBPI working group is expected to publish revised guidelines on the use of OSBPI fungicides in time for the 2024 season. In previous years, new season recommendations have been published in April, so monitoring the FRAC website (frac.info) will advise of changes in application guidance.

Although testing of blight samples submitted to the Fight Against Blight (FAB) campaign in 2023 found no evidence that either 43_A1 or 46_A1 are present in Great Britain, this shouldn't be seen as proof of their absence, stresses Eric.

“The industry has to work on the hypothesis that these strains may already be here, so adapt programmes accordingly. It's plausible that our proactive action, supported largely by mancozeb, has helped to keep them at bay,” he says.

Nick Winmill, head of potato R&D at Agrii, shares the sentiment and endorses the importance of heeding the warnings.

“We're in an uncomfortable position with late blight. It's only through the judicious use of active substances that we've avoided the fate of growers in Europe, but that can't last.

“We urgently require new modes of action to reduce the pressure on the active substances we have, but until such a time occurs, we have to be mindful of the risks to crops and the importance of protecting the products that we have,” says Nick.

Of the products in Agrii trials, potassium phosphonates has shown the greatest potential to contribute to blight programmes, but it's not without its own issues, he says.

“Performance is formulation dependant, but it should be a good mixing partner as ▶

CAA and OSBPI fungicides

FRAC code	Active substance	Fungicide name (example)	Resistance risk	Maximum no. of applications
49	oxathiapiprolin	Zorvec Endavia	Medium to high	3 (2 for seed crops)
40	dimethomorph	in Diprospero in Hubble	Medium to high	50% of the programme or six in total
	benthiavalcarb	Versilus		
	mandipropamid valifenalate	Revus In Valis M		

Source: FRAC



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▶ long as you have the right product. It has the added benefit of multi-site activity and is systemic in nature, but is currently only approved as a co-formulation with ametoctradin,” explains Nick.

Aside from insensitivity to certain modes of action, little else is known about either 43_A1 or the related strain, 46_A1.

“Assay tests will give us detailed information to understand these strains, but the speed at which 43_A1 and 46_A1 have established themselves in the Netherlands is startling. The spread of 43_A1 has outpaced that seen with 36_A2 – the dominant strain in England and Wales. Were the same to happen in Great Britain, it would create significant difficulties, especially in seeking to protect new crop growth,” says Eric.

He likens the situation to playing a game of chess with only 12 pieces, but with an infinite number of moves. “We can’t afford to drop those fungicides with known resistance

issues. Instead, we have to use them strategically and ensure they’re partnered with an active substance belonging to an alternative mode of action.”

He says achieving this in practice, however, is a complex task but one worth pursuing. “We should heed the lessons of both the Dutch and Danish experience of 2023. The latest strains to emerge in the Netherlands are most likely independent events, but the result of poor management practice. Guidelines were ignored, now the rest of the industry will suffer the cost of this short-term behaviour,” stresses Eric.

Mode of action diversity

The first course of action is to protect the efficacy of oxathiapiprolin. In practice, this will mean adding a third mode of action to the sprayer tank. “All Zorvec products will have to be tank-mixed with mancozeb as a minimum,” says Eric.

“We also have to protect cyazofamid, as in Ranman Top, and amisulbrom, as in Shinkon, both of which are Qil fungicides. These too have single-site modes of action and should be mixed with mancozeb or alternatively, Enervin SC (ametoctradin),” he adds.

If there’s one positive from this situation, it’s that Infinito (fluopicolide (FRAC group 43)+ propamocarb (FRAC group 28)) remains unaffected. “Infinito contains two modes of action for which there are no known resistance issues. With a maximum of four applications per crop it’s a useful complement to the other modes of action in the programme,” says Eric.

“Infinito remains a valued anti-sporulant for use in alternation with Ranman Top when the risk of tuber blight becomes a concern, but it also has a valuable role to play in delivering a balanced programme that follows best practice,” he adds.

In recognition of the ongoing difficulties



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facing growers, processor Albert Bartlett has relaxed its restrictions on the use of propamocarb. As a result, mixes containing the active appear set to be approved until the end of July.

“If you accept that resistance to OSBPI fungicides is likely to be confirmed at some point in the near future in mainland GB, then there’s little choice but to accept that propamocarb is the only reliable anti-sporulant available. In practice, this means tank mixing either Axidor or Proxanil (cymoxanil+ propamocarb), or using Infinito as a co-formulated product. The better persistence of Infinito gives it the edge,” says Eric.

The emergence of 43_A1 and 46_A1 may also have implications for cultivar resistance ratings. As an example of the aggressiveness these strains possess, Eric cites the impact on Kuras, a popular starch variety with previously strong late blight resistance.

“Kuras was one of the most blight resistant varieties available, but its resistance has collapsed in the face of these new aggressive genotypes,” he says.

The published variety resistance ratings predate the newer strains of recent seasons so can be considered of little value to growers and advisers when seeking to develop a truly holistic approach to IPM, he warns.

“Reliance on published foliar or tuber blight resistance is a high-risk strategy in relation to the value of the potato crop. In view of the speed of disease development and its devastating impact on crop output, using effective fungicides which focus on disease prevention is a preferable course of action,” concludes Eric. ■

Forward-thinking farmers

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