

Aggressive strains on the rise

“ We need to keep 36_A2 under consideration as it's clearly more aggressive. ”

Roots Potato agronomy

Something interesting is going on in the blight population in Europe and these same lineages have now become established in the UK. CPM finds out the latest on the UK situation and reports the launch of a new nematicide.

By Lucy de la Pasture

2018 was an usual season and, by and large, late blight (*Phytophthora infestans*) wasn't a great problem. Even so, monitoring has revealed more changes in the blight population, says Dr David Cooke of James Hutton Institute, as he gave an update at AHDB's Agronomist conference in Dec.

"There was generally low blight pressure which was reflected in the much lower number of active Fight Against Blight (FAB) scouts and reported outbreaks than in recent years. The relatively small number

of samples means the results may have some sampling effects," he explains.

Just 33 FAB scouts collected samples from the 40 blight outbreaks recorded, generating 266 samples, of which 185 were genotyped at JHI.

Cold start

"The lower trickle of samples compared to a more average season was a result of the cold start to the year and a late planting season. There were early signs of blight in April from primary inoculum on outgrade piles in Kent but the hot, dry weather that followed put an end to outbreaks. Where there was localised rainfall in Sept and Oct, blight was a problem in some circumstances and outbreaks were more active than expected."

The results of David's genotyping show the ebb and flow of clones in the blight population. "13_A2 (blue 13) has declined to 6%, which is lowest it's been for many years. 6_A1 (pink 6) continues to dominate and was found to be present in 46% of the population, but the headlines were taken by the new lineages, 37_A2 (dark green 37) and 36_A2 (light pink 36)," he explains.

36_A2 was first detected in the UK in

2017 and has risen from 2% to 18% of the population and the fluazinam insensitive 37_A2 showed a small fall from 24% in 2017 to 19% in 2018, though David cautions there may be some sampling effects due to the relatively low numbers of samples received.

Regionally there were differences in blight populations, with the South West, Wales and Scotland predominantly 6_A1 ▶



David Cooke explains 36_A2 isolates are very aggressive, forming amongst the largest mean lesions and having abundant sporangia.



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Active ingredients used in AHDB fungicide sensitivity testing

Fungicide Group (FRAC Code)	Active Ingredient
Benzamides (43)	fluopicolide
CAA (40)	mandipropamid
Carbamates (28)	propamocarb hydrochloride
Qil (21)	cyazofamid
Uncouplers of oxidative phosphorylation (29)	fluazinam

Source: James Hutton Institute.

▶ and small amounts of 6_A1 and 1_A1 in Kent. The two new lineages showed no significant expansions in range, with 37_A2

found from Shrops to Lancs and 36_A2 confined to Kent and The Wash.

In parts of Europe, populations of 36_A2

and 37_A2 are increasing fast, indicating they may be more aggressive. Samples from lineages collected across Europe have been tested by Roselyne Corbieres and Didier Andrivon at INRA (France) for their relative aggressiveness.

“On average, 36_A2 isolates were found to form amongst the largest mean lesions and have abundant sporangia, similar to 6_A1 in aggressiveness, which supports the evidence from outbreak sampling. The small differences in lesion size and sporangia seen in the lab make a big difference in the field as late blight is a polycyclic disease,” explains David.

So what’s driving the change in blight ▶

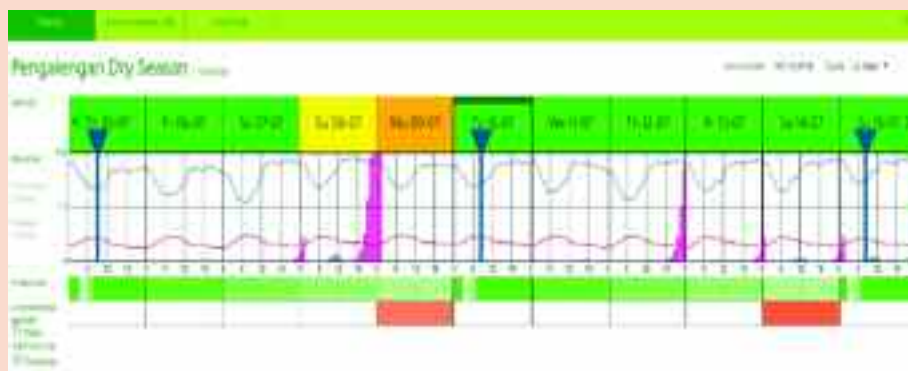
The Dutch experience

In Holland standard practice is to begin blight spraying at emergence and continue through the season, says Geert Kessel of Wageningen University and Research. Problems with tuber blight control at the end of the season is precipitating a change to blight control in the Netherlands, he explains.

“There’s a move away from a weekly blight spraying programme to one underpinned by decision support systems (DSS) that determine the frequency of sprays and the mode of action required to provide the appropriate activity — protective, curative or eradicator.”

Traditionally blight programmes have been blocked, with a single mode of action being applied 4-6 times in sequence before changing to another MoA. Typically, a block treatment will start with a systemic fungicide such as Revus (mandipropamid), then progress to a block of Infinito (fluopicolide+ propamocarb) and then move to Ranman (cyazofamid) at the end of the season for tuber protection, describes Geert.

“This system is under much discussion and is likely to change to a shorter alternation, so products from different groups are used more frequently within the programme,” he says.



The decision support system being developed at Wageningen takes into account fungicide degradation of previous sprays and crop growth.

“*Phytophthora infestans* is a highly dynamic pathogen, which is the root of the problem. It’s changing all the time and as soon as we know how to control it, it changes again and gets out of control.”

Using DSS isn’t without its problems and there are two key issues Geert highlights. “Fungicide timing ideally needs to be before any predicted infection events for the best control of blight. It also needs to take into account the fungicide

degradation of previous sprays and crop growth. This can mean very short spray intervals are sometimes triggered,” he explains.

He points out only a few fungicides have curative properties, highlighting propamocarb and cymoxanil. To obtain eradicator activity on blight means a combination of at least two fungicides is needed to obtain the very strong curative and antispore properties needed.

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Aggressiveness is one factor but fungicide sensitivity can also play a part.

► population? Aggressiveness is one factor, says David, but fungicide sensitivity can also play a part, as has been seen with 33_A2 and 37_A2 to fluazinam. AHDB has commissioned research to look at fungicide sensitivity (protectant tests) in lab assays, conducted according to FRAC protocols and concentrations.

"It's important to note that the range of rates tested are well below field rates in order to obtain a dose response curve and EC50 values for the active ingredients tested," highlights David.

The research conducted by Alison Lees at JHI tested key actives from different

FRAC groups; fluazinam, cyazofamid, propamocarb, mandipropamid and fluopicolide.

37_A2 was discovered to be insensitive to fluazinam in 2017 and the testing confirmed this, with blight lesions forming at the maximum field rate of fluazinam. 13_A2 and 6_A1 were all sensitive to fluazinam but at the very lowest concentration tested, 36_A2 formed some lesions.

This ability to produce the largest lesions at the low concentrations was a trend only 36_A2 showed to all the other active ingredients tested. ►

Liquid nematicide offers new approach to PCN control

A liquid nematicide that claims performance approaching that of full-rate granular alternatives, but at a fraction of the application rate and half the cost has been launched by Bayer. Containing the SDHI fluopyram, Velum Prime is set to change the way growers approach potato cyst nematode control.

Speaking at the product launch, Neil Thompson, Bayer channel marketing manager for root crops, says, "Velum Prime heralds a new era in nematode control that will extend crop protection to all growers, including those for which in-crop PCN management was not previously possible, such as those with short-season salad crops."

Initial approval for the product, which has an application rate of just 0.625 l/ha (250g a.i./ha), is for in-furrow application only, but Bayer is hopeful of receiving approval for an overall spray using a conventional boom sprayer in the future.

Probably of greatest interest to growers is its competitive cost relative to other nematicides, which when combined with its ease of use and lack of a harvest interval, is hoped will extend its appeal to situations where previously it had been

difficult to justify the expense or inconvenience of tackling PCN populations.

"There's a range of prices of granular nematicides, but Velum Prime is likely to be around half the cost of granules," says Neil. Significant volumes of the product will be available in year one.

While Velum Prime will be appealing on its own in lower PCN-pressure situations, its contribution to protecting yields when used in combination with conventional nematicides will also be of interest to growers, he believes.

"In 10 trials, the use of Velum plus half-rate Vydate (oxamyl) gave an increase of 3.0t/ha over the full rate (55kg/ha) Vydate-only treatment, while a similar treatment of Velum with half-rate Nemathorin (fosthiazate) gave an average yield increase of 0.8t/ha over the full rate (30kg/ha) Nemathorin-only treatment," says Mr Thompson.

"Across more than 30 trials, Velum delivered an average yield increase of 3.3t/ha and a reduction in PCN eggs of 25%, measured using Pf (final egg numbers)/Pi (initial eggs at planting) counts"

The introduction of Velum Prime has been welcomed by Peter Blaylock, company agronomist for independent processor, E Park & Sons, who's clear in what he sees as the new products benefits.

"The need to take a more determined approach to PCN control, that considers every crop and PCN situation, is long overdue," he says.

"Velum Prime delivers good control and is free of the stewardship restrictions or waste disposal issues associated with granular products that do so much to inconvenience growers. To overlook its potential to improve and extend the protection we seek to give crops would be extremely short-sighted and run contrary to ICM principles, especially where varietal choice exacerbates the PCN problems in the UK," he comments.

Although not a barrier to its use, Peter believes



Peter Blaylock believes growers need to consider Velum as part of an ICM approach to manage PCN.

growers will need to consider the practicalities of application if they're to ensure suitable product placement.

"It's relatively immobile once in the soil profile, so care will need to be given to nozzle positioning if the active is to be delivered to the soil around the root zone. Those growing in beds rather than rows, as is the case with salad crops, will want to adjust rates to reflect the use of an additional nozzle," he adds.

While another means of PCN control will be welcomed by growers, Bayer has been careful not to suggest it's a silver bullet. The company's message is to consider Velum Prime as part of a programme of measures, including the use of resistant varieties, granular nematicides and rotation.

"Velum is by no means the complete answer to the problem posed by nematodes, but it will be part of the solution. "It'll be for growers and agronomists to determine how best to use it in their particular situations to contribute to protecting quality and improving yield of their crops," concludes Neil.



New nematicide Velum Prime is likely to be around half the cost of granules, says Neil Thompson.



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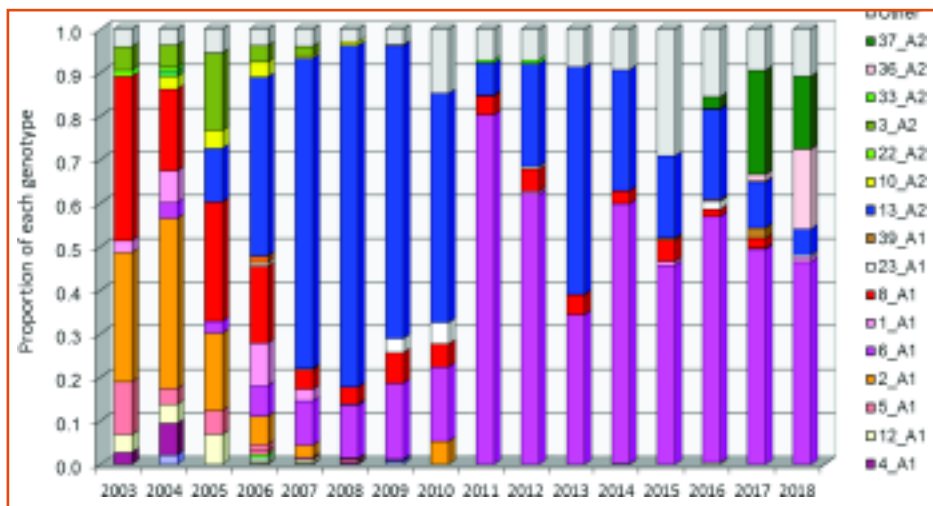


Potato agronomy

▶ “There’s no evidence of 36_A2 having resistance to any active ingredient but the fact it forms slightly larger lesions means there’s some generic effect, which may be related to its aggressiveness. We need to keep 36_A2 under consideration as it’s clearly more aggressive.”

Asked whether there may be an efflux pump mechanism at work in 36_A2, David confirms this is a possibility. Although the low dose fungicide sensitivity work is well below field rates, he advises that it’s something to be aware of.

“When blight fungicides are applied in the field, the field rate will reach the upper leaves but there will be leaves further down the canopy which don’t receive field rate, as well as new growth, so the low dose work is important,” he highlights. ■



Genotyping shows the ebb and flow of clones in the blight population, with 6_A1 continuing to dominate and increases in the new lineages, 37_A2 and 36_A2.

Biological fungicide offers perfect complement

Trials investigating the relative performance of Serenade ASO, Bayer’s biological fungicide containing *Bacillus subtilis* QST 713, continue to deliver promising value to potato growers. In soils where there’s higher pathogen pressure, it performs best when applied in conjunction with conventional treatments. In lower pressure conditions, its contribution is often enough to be applied as a stand-alone treatment.

Trials to date have found performance varies between sites, but there’s regularly a positive effect on potato yields, with 10 out of 13 UK and European trials showing yield increases and an average yield increase of 4.6t/ha across all 13 trials. In addition, Serenade’s use has led to increases in marketable yields through more consistent tuber size and better skin finish.

“Performance is often influenced by external factors such as soil type, moisture, temperature and disease pressure. This is perhaps not surprising given Serenade is a living organism which will interact with the physical and

biological characteristics of the crop and the soil,” says Tim Lacey, Bayer campaign manager for horticulture.

While the fungicide’s development remains a case of work-in-progress, recent trials have highlighted its contribution to black dot control when applied with Bayer’s new tuber treatment, Ernesto Prime (penflufen), as well as positive effects against watery wound rots (*Pythium*) and other soil diseases seen in previous trials.

When applied with Ernesto for *Rhizoctonia solani* control, trials from Scotland in 2018 identified a significant reduction in the incidence of black dot compared with untreated plots. “Ernesto at 1kg/t and Serenade at 5 l/ha in-furrow gave one of the best reductions of black dot of any treatment in trial, reducing the incidence of disease by nearly 50% over the untreated.”

Although further trials are needed, its contribution is more than just that of a supporting partner. When co-applied with Velum (fluopyram)



Tim Lacey highlights trials where biological fungicide Serenade has given good control of black dot when used with Ernesto seed treatment.

for improved yield protection in the presence of PCN, you can expect to gain both tuber quality and yield benefits from Serenade application, as well as the PCN protection from Velum Prime, adds Tim.

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