Plan blight strategies in reverse

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Potato blight

Blight strategies have become increasingly complex over the past decade or so. *CPM* looks at the latest changes in the blight population and how best to design blight programmes in light of them.

By Lucy de la Pasture and Rob Jones

News that another previously undetected strain of late blight (*Phytophthora infestans*) has been confirmed in Great Britain will surprise few. Fortunately, 41_A2 has so far only been found in a crop of Maris Piper grown in Fife but on the balance of probabilities, it’s unlikely to be an isolated case.

That’s the view of Nick Winmill, Agrii head of potato technical and development. But its presence raises some interesting questions and one of the most confounding is how did the new strain get there? It’s a pertinent question given that the UK has not allowed seed imports for the past two years, he says.

There are several possibilities, but some are more plausible than others, notes Nick. “It may have been carried on the wind but at 700km against the mainly prevailing airflow, I believe this is unlikely to be the reason. A more plausible explanation would be that it has either been here for several years undetected — it was first detected in Denmark in 2013 — or that it spread from another host, perhaps tomato. Either way, once here these strains tend to stay.”

So what do we know about 41_A2 and does it have characteristics that set it apart from other strains? Perhaps more importantly, should growers be concerned? The short answer is that enough is known about 41_A2 to take it seriously but there’s no reason to be despondent, believes Nick.

Highly aggressive

“Research suggests it’s highly aggressive and we know from work in Estonia that it has exhibited some insensitivity to fluazinam. Work in Denmark suggests a shorter latent period, meaning it can cycle between sporulations more quickly than other more established strains. The consequence of this is yet another reminder of the need to be vigilant to the threat facing crops,” he says.

Results of the blight samples submitted by blight scouts reveal how the blight population is becoming highly regionalised. While this is perhaps a reflection of how the advice to growers on crop protection varies across the country, it could also be a function of how conditions at a local level influence disease spread. In Wales, for example, there’s a high incidence of the fluazinam-insensitive strain 37_A2, while in England 36_A2 accounted for 40% of samples in 2021.

The 36_A2 strain is less well established in Scotland, where 6_A1 dominates — accounting for 30% of cases tested. Another strain, 8_A1, has become more prevalent in Scotland in recent years and was found in 15% of samples in 2021, but it’s rarely seen elsewhere in Great Britain.

“The results are most valuable when viewed through the prism of the limited fungicide choice,” says Nick.

“We know 36_A2, and to a lesser extent 37_A2, can sporulate at lower temperatures than either 13_A2 or 6_A1. The reason neither of these strains have established successfully in Scotland is a mystery.”

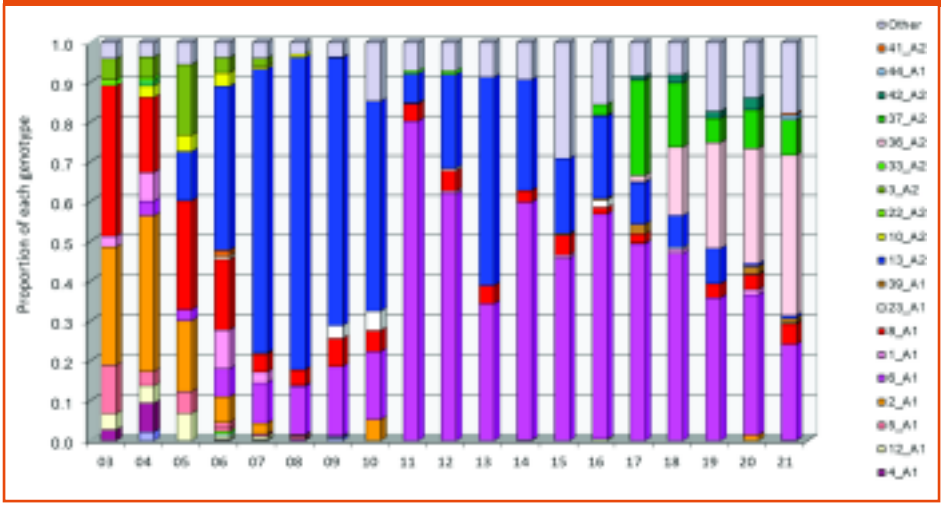
The shorter latent period of 36_A2, which is now an old foe, and most recently 41_A2 presents another challenge, says Nick. “How can we maintain protection between irrigation passes at times of high risk to crops?”

That’s when looking back can provide lessons for the coming season, he says. ▸

It’s the choices growers make earlier in the season that will shape the blight strategy towards the end, says Nick Winmill.

Blight programmes now have to start much earlier as blight genotypes have been displaced by more aggressive strains.

Blight genotypes in the population 2003-2021



Source: The James Hutton Institute, 2022

▸ In 2021, the period of high pressure in July, especially in the south and east of England, highlighted the capacity of modern strains — in this case 36_A2 — to inflict considerable damage in only a short period of time, he says.

It's the fitness advantage these strains demonstrate that's changing the way crop protection strategies are delivered, believes Nick. His advice to growers is to plan for the worst but hope for something far less devastating.

"In some situations it can be easier to plan backwards from desiccation. This way crops can be adequately protected, and programmes comply with resistance management guidelines.

"At the basic level, the main development (with the evolution of the blight pathogern) is that crops come under pressure at lower temperatures than in the past. This means keeping an eye on temperatures and being ready to start earlier than might have been the case just five or so years ago."

FRAC guidelines

If this were the only development it probably wouldn't be much of a problem but add in a latent period of less than four days and the complexity becomes clear. How growers schedule irrigation and spray timings to fit around blight spraying presents a problem," he says.

"Add in some high blight pressure for a month and this is when programmes can move from 10-12 sprays, to the mid to high teens. Under such circumstances, staying within the FRAC guidelines for resistance management can be a challenge," he adds.

The overriding objective, believes Nick, must be to preserve the integrity of the products available and minimise the risk of insensitivity developing.

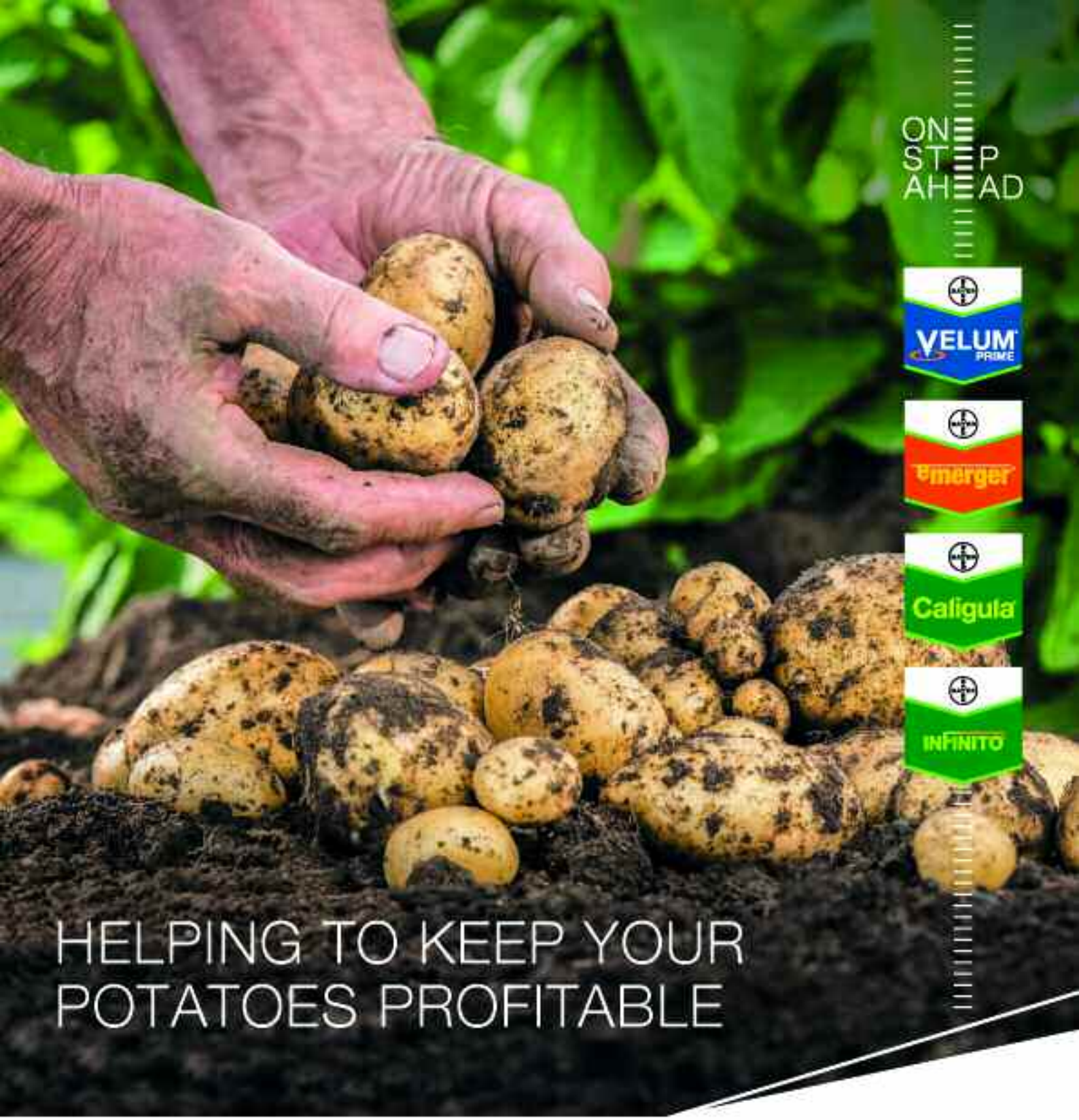
"I still favour mancozeb as a mixing partner, especially during the early season when it will be useful for protecting against alternaria, but also because of its multi-site activity. Multi-sites are important in protecting the effectiveness of not just the products we have now, but those coming in the future.

"We have seen this in our trials. The pipeline products coming through from manufacturers deliver strong protection in their own right, but they're all single site mode of action products so they need a strong partner to protect them from the risk of insensitivity developing. This is about being smart in the programme," he says.

As the season progresses, there's a necessity to bring in other partner products. ▸

Summary of blight genotyping finding in 2021

- **Population** – *Phytophthora infestans* continues to change – 2021 blight was locally serious with more than 200 outbreaks as part of AHDB's last season of Fight Against Blight reporting across GB
- **Displacement** – there was displacement of previously dominant genotypes (13_A2 and 6_A1) via continued expansion of the 36_A2 genotype that now comprises 40% of the sampled population
- **Incidence** – the incidence of the 37_A2 genotype with fluazinam insensitivity decreased from 10 to 9% of the population with 6_A1 reduced to 24%
- **Aggressiveness** – the aggressive clones are putting pressure on blight management – management mistakes may be costly
- **Inoculum** – more than 80% of the population is clonal, with primary inoculum surviving in tubers (e.g. seed, volunteers, dumps) from the 2020 season. The remaining one fifth of blight outbreaks start from genetically diverse inoculum (on the charts termed 'Other') emerging from long-lived sexual oospores. All sources of primary inoculum should be managed carefully; long rotations help manage oospore risk
- **Spatial variation** – local differences in genotype frequency apparent with 64% of samples being of 36_A2 in England compared with 6.5% in Scotland. Conversely, almost 42% of samples from Scotland are 'Other' compared with a mean of 8% from England and Wales. The 8_A1 genotype also comprised 15% of samples in Scotland but was not reported in other British crops
- **New threat** – 41_A2, a genotype never sampled previously in GB was found in a crop in Scotland (late August 2021); the 41_A2 type was first reported in Denmark in 2013 before spreading to other Nordic countries as well as Poland and Germany. The migration pathway into Scotland and its potential impact are unclear. This highlights the future threats of such incursions and the need to understand the spread and impact on IPM
- **Fungicide sensitivity** of isolates of the 6_A1, 36_A2 and 37_A2 lineages to seven key fungicide active ingredients were tested in the laboratory. No changes in sensitivity were detected but growers should follow manufacturers' and FRAC guidelines to protect the lifespan of active ingredients



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To stay within FRAC guidelines, careful planning is required so that fungicides to protect against tuber blight are still available for use at the end of the season.

▸ It's the choices growers make at this time that will shape the blight strategy towards the end of the season, he says.

"I would encourage growers to trade up from cymoxanil to Versilus (benthiavalicarb). There's strong data from SRUC comparing the curative performance and forward protection from benthiavalicarb and cymoxanil. We know from other work that cymoxanil has at best 36 hours of curative activity, but we now know Versilus plus the drift retardant, Crusade, that there's an uplift in performance that takes its curative activity above that of Infinito (fluopicolide+ propamocarb), which is widely regarded as the standard to beat. This will be vital in periods of high pressure in the mid-season," he believes.

"The strong performance of Versilus and its compatibility with a range of other active substances means that it has a place across the programme. Making the most of its contribution while staying within FRAC guidelines is the challenge. For those who favour Zorvec Endavia (benthiavalicarb+ oxathiapiprolin) it creates a difficulty," he adds.

Product sequences

FRAC guidelines state that no more than six fungicides from the Carboxylic Acid Amide (CAA) mode of action group, of which benthiavalicarb is one, should feature in a programme and that no more than three consecutive applications of a CAA should be made. It also gives the guidance that CAA fungicides shouldn't make up more than 50% of the programme.

For those keen on saving a CAA for elsewhere in the programme, one option is to switch to a zoxamide-containing product, such as Lieto (cymoxanil+ zoxamide), advises Nick.

"If we're to stick to the FRAC limitations, then it makes sense to use mancozeb — either with or without cymoxanil — in the early part of the programme because the focus is on protection in, what we hope is, comparatively low pressure. This leaves benthiavalicarb for use later, possibly in combination with Enervin (ametoctradin)," he says.

More consideration could be given to construction of the blight programmes to avoid becoming backed into a corner should the disease pressure intensify, believes Nick. The big question to consider is what to do if programmes expand from a typical 10-12 sprays to a programme consisting of 16-18, he says.

"There are desiccation implications stemming from the loss of diquat. In general terms, think about desiccating a week earlier than previously. In practice this means not being late with nitrogen fertiliser applications either."

It's often easier to plan the programme in reverse to make sure there's sufficient tuber blight protection at the end of the season to run alongside the desiccation programme, says Nick.

"This means we can use the two Quinone inside Inhibitors (QiI) products, amisulbrom and cyazofamid, with a suitable mixing partner and in alternation with products containing another mode of action, such as Infinito (fluopicolide+ propamocarb).

"The approach will change again in 2023 as we expect to have a new product come to market that will expand the product choices," he concludes. ■

Sums add up for potato weed control

Greater use of natural regeneration breaks and cover crops in arable rotations means the weed seed burden of some of the more troublesome weeds for potatoes are on the increase, according to Syngenta.

Potato growers feeling the pinch of price pressures this spring could look at simplifying herbicide mixes for more cost-effective pre-emergence options, advocates Syngenta technical manager, Andy Cunningham.

"Recent potato herbicide introductions have increased agronomists' options. In many instances, simple mixes can achieve everything growers want at lower relative cost," he suggests.

Many of the key weeds during early potato emergence can be controlled using the strength of mixes to widen the specific weed spectrum, adds Andy.

In recent trials, a mixture of Defy (prosulfocarb) at 4.0 l/ha plus metabromuron at a reduced rate of 1.0 l/ha, achieved full control of broadleaf weeds present, which included chickweed, mayweed, cleaver and shepherd's purse. Untreated weed pressure from these species was more than 70/m2.

That combination, typically costing just £43/ha hectare at current prices, was even more effective overall compared with Defy at 3.0 l/ha and metabromuron at a rate of 2.0 l/ha, which would cost nearly £55/ha and proved slightly weaker on cleavers, he says.

Using Defy at 4.0 l/ha plus metribuzin at 0.5 l/ha could also reduce costs, believes Andy, but the trial showed that overall effects on some weeds may be reduced. "It's important to know the target weed spectrum when putting together mixes of the most cost-effective actives and appropriate rates."

As well as the wide spectrum of broadleaf weeds controlled by Defy, it also offers control of grassweeds including meadow grasses and ryegrass, he says. "Using a higher rate extends the residual activity and means applications can be conveniently made soon after planting, until soil is rising over emerging potato shoots, to keep fields clean through to crop emergence."

New Syngenta potato trials for the 2022 season are set to investigate the extra benefit of total weed spectrum control from increasing Defy rates to 5.0 l/ha, at marginal extra cost in a high-pressure situation, as well as mixes with new and existing herbicides.

Andy Cunningham suggests simple herbicide mixes can achieve everything growers want at lower relative cost.

"Some options with newer herbicides in the trial add up to in excess of £100 per hectare, with others as low as £20. It's vital to tease out what each component is contributing, to enable better informed decisions in the future," he adds.

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