Research targets virus yellows solutions

BeetField22

In another difficult season for virus yellows control, *CPM* finds out about some more radical approaches to aid control at BBRO's BeetField22 open days.

By Mike Abram

> *"The reason why aphids are a good vector is that they don't really like sugar beet, so happily migrate through the crop."*

Research into different options has started despite BBRO waiting to hear whether Defra funding for a more extensive package will be given, says Dr Alistair Wright, BBRO's crop protection scientist.

The lack of clarity over funding has reduced the organisation's ability to deliver crucial research this spring, with no guarantees of future derogations for neonicotinoid seed treatments, he admits.

Rothamsted modelling predicts virus yellows levels of 69% in the absence of any control measures this season, with its associated prediction of first aphid flights by 19 April shown to be accurate to 24 hours.

Some non-neonicotinoid treated crops had already been sprayed twice by mid-May, while treated crops require close monitoring from eight weeks after drilling, with follow up sprays likely to be required with slow spring crop growth, says Alistair.

As the search for alternatives to neonicotinoid seed treatment continues, BBRO is taking an 'ABCD' approach to controlling the aphids which transmit virus yellows in sugar beet.

Alternative approaches

The high pressure makes it a good season to test more radical alternative approaches, alongside ongoing breeding efforts, with the 'A' in 'ABCD' standing for attractants, or alternative hosts to pull aphids away from sugar beet, says Alistair.

"The reason why aphids are a good vector is that they don't really like sugar beet, so happily migrate through the crop. Each time they land and feed they're transmitting virus, producing progeny, and then carrying on."

BBRO has found growing an alternative host, brassicas, has been reasonably effective at pulling aphids away in its variety trials. "In the autumn and next spring, we want to follow this up with some field strips. But asking growers to take several beet hectares out of production is an expensive exercise, which is why we need the funding from Defra to do it."

Beneficial biological control forms the 'B' in BBRO's programme. Last season a farm in the fens experimented by introducing beneficials, but no conclusive results were possible due to low aphid numbers, explains Alistair.

However, buying-in beneficials is very costly and not particularly hardy after ▸

A high-pressure season for virus yellows will help test the merits of different approaches for control, according to BBRO's Alistair Wright.

Ranman® TOP

- Controls foliar and tuber blight
- Market leading potato fungicide
- Easy to use formulation
- Excellent rainfastness
- Can be used throughout the growing season

BELCHIM CROP PROTECTION

Technical enquiries: 01480 403333 | www.belchim.co.uk

ABCD approaches to virus management

A – Attractants (alternative hosts)

B – Beneficials (biological control)

C – Camouflage (cereal cover crops)

D - Deterrents (essential oils)

▸ being reared in the glasshouse, so this year's trials are concentrating on building natural populations of beneficials. That's happening at Morley in Norfolk, where flower strips have been sown in beet fields to provide a bridge to move beneficials out into the beet crop, he continues.

"Research papers claim beneficials, such as lacewings and hoverflies, should move around 100m away from the flower strips. At Morley last year we saw a green border around the flower strips, but unfortunately only about 10m into the crop.

"It does work and hopefully with more research we can get some better results."

'C' is for camouflage, after some evidence from 2020 suggested growing cereal cover crops showed major reductions in virus yellows, says Alistair. "The idea is to use barley to obscure the beet from the aphid — they require contrast between the green and brown. The barley will compete with the beet for nutrients and water, especially in a dry spring, and in 2020 we also saw that yields were severely hampered (if competition wasn't removed early enough)."

BBRO has asked beet growers to test and help optimise this technique, particularly the timing for barley destruction, by growing strips of barley cover with non-cover strips. BBRO will use a combination of drone, satellite, and grower observations to assess the impact on virus levels later in the season.

Another way being tested to remove the green/brown contrast is spraying blue, red and green natural dyes to fields, says Alistair. "How long the dyes last will be affected by the weather and the soil colour, but it could extend the period before you need to use an aphicide."

A similar theory is to use essential oils to repel aphids — the 'D' for deterrent. "We're hoping to look at lavender, mint, garlic, and molasses to see if spraying these on when aphids are migrating into the crop causes them to fly in a different direction or avoid fields altogether."

Variety choice

Analyse sugar beet varietal performance on farm, both during and at the end of the season, to help guide decision-making for the following season, urges BBRO's head of knowledge exchange Simon Bowen.

While BBRO/BSPB's Recommended List and other variety trials provide a lot of information, performance can vary massively by soil type, he says. "I'm a great believer that some varieties suit some soil types or areas, and we can't always pick that up in the data."

Key characteristics to monitor are early canopy vigour, and later in season disease levels and vigour again, he suggests.

"Some varieties retain vigour and grow more strongly towards the end of the season, and clearly if you lift late, those are the kind of varieties you want in your mix."

Growth habit is also important — some grow very upright, such as BTS1915, he adds. "We think that's good for intercepting light in the autumn and good for late harvesting, but there's also a weed control consideration. In those varieties we have seen some later germinating weeds, such as fat hen come through."

Simon reckons the more prostrate varieties are probably more useful where there are problematic and high weed densities. "Think about those growth habits in relation to weed control, which is something we haven't had to do as we've had good chemistry. But as we lose chemistry, we have to understand how to use varietal traits."

Within a portfolio of varieties, as well as considering whether any specialist traits are required — such as tolerance to beet cyst nematodes, ALS-herbicides, beet mild yellows virus or aggressive rhizomania — look at drilling date suitability, recommends Simon.

"With the weather patterns we're having, we seem to have an opportunity to drill quite early. So it's worth having a variety that has a low resistance to bolting in your portfolio to take advantage."

Sugar content is another characteristic to look at, he adds. "There is variation,

BBRO is experimenting with novel approaches to prevent virus yellows in sugar beet crops, including spraying essential oils as an aphid deterrent.

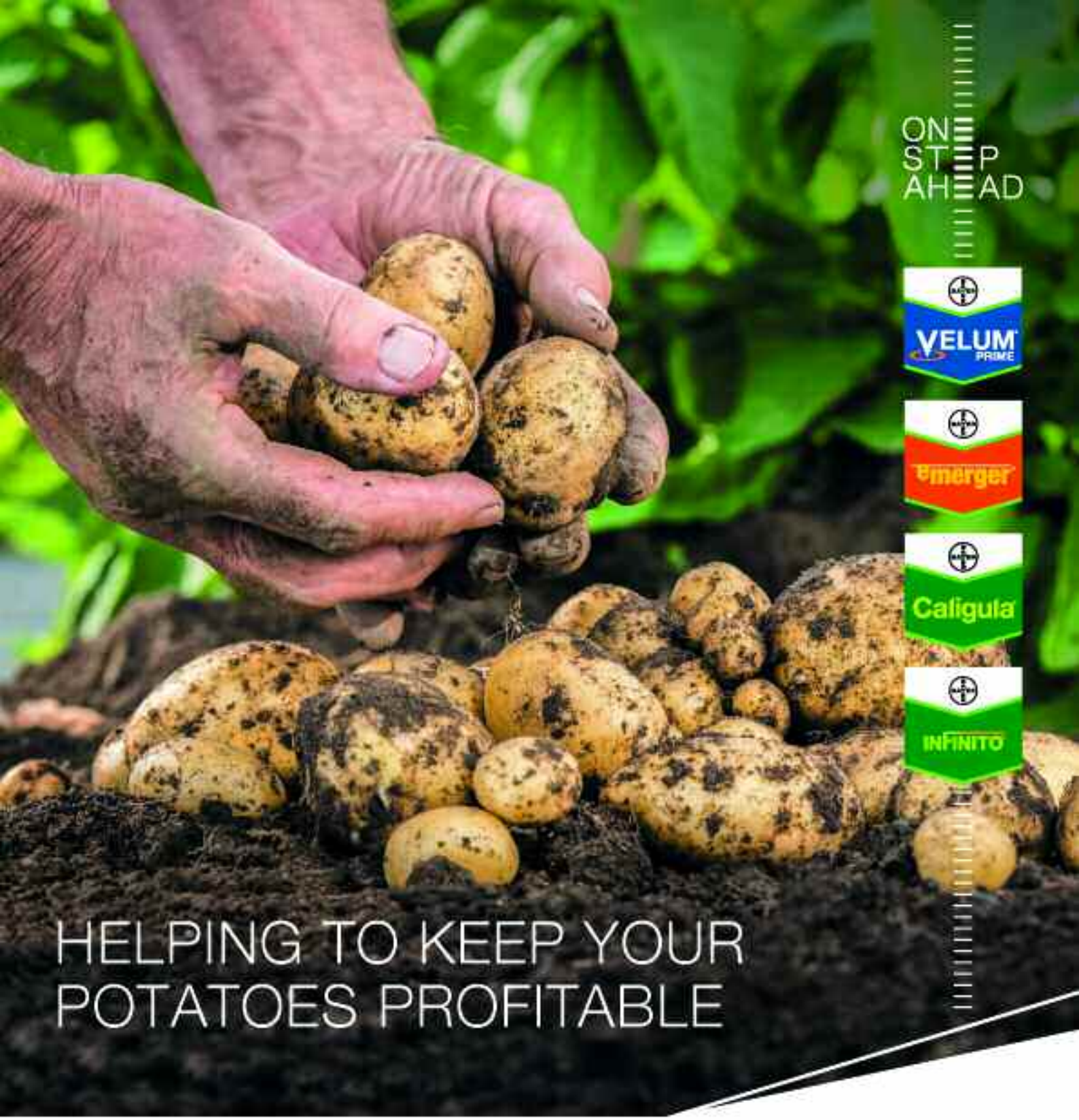
with the highest at 17.5% and lowest at 16.5%. If you're early lifting, avoid varieties with lower sugar content as they can proportionately be affected more bysummers like last year with low sunshine hours."

Finally, disease susceptibility is something else to consider. Cercospora ratings have been added to the RL after two years of trials, says Simon. "There's not much useful resistance currently but there are some differences. So use that rating and particularly for rust, where there are some bigger differences if you're later lifting."

Fungicide shortages?

Be aware of a potential shortage in options for sugar beet disease control this summer, warns Prof Mark Stevens. ▸

In the absence of Escolta, Mark Stevens is nervous about having an 8-10 week gap between sprays of Priori Gold or Angle in mid-July and mid-September.



HELPING TO KEEP YOUR POTATOES PROFITABLE

At Bayer, we know that potato growers are facing continued challenges from crop agronomy, to loss of actives and tightening market specifications. Our expert team is here to support you, providing trusted advice throughout the year, alongside our range of innovative, class-leading products. Whether it's improved *Alternaria* control with Caligula, easier PCN control with Velum Prime, or tried and trusted weed and blight control from Emerger and Infinito, we have the innovations to support your business.

To find out more, and to subscribe to our digital newsletter, Potato Monthly, visit **cropscience.bayer.co.uk/potatoes**

Trust Bayer to keep you one-step-ahead for potato growing success

Analyse variety performance and characteristics to help select next year's beet varieties, suggests Simon Bowen.

▸ Previous seasons' market leader Escolta (cyproconazole+ trifloxystrobin) is in its use up period and is no longer available to buy. Industry estimates suggest there's enough stock already in sprays sheds for one spray on around 10% of the beet area, says Mark.

That leaves Priori Gold and Angle (both azoxystrobin+ difenoconazole), plus Impact (flutriafol) as the remaining approved options, with the beet industry struggling to obtain an emergency approval for Bayer's Caligula (fluopyram+ prothioconazole).

One potential issue, particularly where Escolta isn't available, is a long gap between applications of the azoxystrobin+ difenoconazole products if Impact is used in between, he notes.

"Impact has activity against cercospora and ramularia, but it can open the door for rust and mildew. In a conducive year, it would make me nervous having an 8-10 week gap between sprays of Priori Gold or Angle in mid-July and mid-September. We need to think about all the diseases under UK conditions."

Focus on nutrition

Foliar feeding sugar beet crops might be worthwhile to push crops to get to the 12 true leaf stage as quickly as possible, particularly in dry springs that are becoming the norm, says Simon.

There are six key nutritional drivers for early canopy development: nitrogen, phosphate, magnesium, manganese, sulphur and boron, he explains.

Readily available phosphate is important for root growth, while magnesium and manganese are integral for chlorophyll production. Sulphur, if it hasn't been applied in the seedbed or the land isn't manured, can run short, while boron deficiency is becoming more common on light sandy soils or more acidic soils.

"With the dry springs these crops are struggling to get these nutrients at a time when they want to grow very quickly," he says.

Timing is key with foliar feeding — there needs to be enough canopy but before the crop is showing deficiency symptoms. "Feeding through the leaves can be more effective than through the roots, but application conditions need to be right."

Simon suggests that means temperatures below 20°C with some humidity, typically early morning or early evening, are ideal as this is when crops are actively growing. Keep droplet size relatively small to avoid scorch, he advises.

"I favour a little and often regime, with seven to 14 days between applications — depending on how stressed crops are. And if the product you're using doesn't have a sticker adjuvant, think about adding one as that helps stick the product onto the leaves and helps with penetration."

Simon also highlights the nitrogen response curve in sugar beet flattens off considerably above 90-100kgN/ha. With current high fertiliser prices means it's uneconomic to apply above that level, and is why BBRO recommends a 15-20% reduction this season, he says.

For next season he highlights some other areas to consider when thinking about nitrogen management. These include accounting for what nitrogen is already in the soil, especially after cover crops and manures, potentially using a soil mineral nitrogen test.

Using nitrogen more efficiently is obviously critical, he adds. "Make sure you're managing pH so your soils are working for you. When pH drops below 6.5, nitrification in the soil slows down and less nitrogen will be converted. So get it measured and make sure it's above 6.5 and ideally around pH7."

Placing nitrogen in a band 7-8 cm below and to the side of seed is another possible way to use fertiliser more efficiently. "We've shown it can advance canopy growth. Some growers using it on farm have found they can cut back rates from broadcasting 120kgN/ha to placing 100kgN/ha, which obviously with current prices is a big saving. It might mean changing a drill, but we are seeing agronomic advantages," he concludes. ■

BBRO has found growing an alternative host, such as brassicas, has been reasonably effective at pulling aphids away in its variety trials.

Slight differences in vigour could be seen at BeetField22 between neonicotinoid-treated sugar beet (right of larger row spacing) and untreated (left) in mid-May.

FMC An Agricultural Sciences Company

SPOTLIGHT® PLUS

The most reliable stem desiccant on the market

SPOTLIGHT® PLUS

Desiccant

- Approved to use on all ware and seed potato varieties
- For use on all soil types
- Rainfast after 1 hour
- 7 day harvest interval
- No following crop restrictions or cultivation requirements, plant any crop one month after application