

# Elicitors bring a new dimension to blight control



*“By using elicitors regularly within blight programmes, we may be able to slow down or stop the selection of more aggressive strains.”*

LAWRENCE VERYSSE

As new late blight strains emerge and the traditional fungicide armoury becomes more limited, control programmes are having to adapt. Using elicitors to bolster plant defences could be an important part of this new approach, *CPM* learns why.

By Rob Jones

**T**here's little margin for error when controlling late blight (*Phytophthora infestans*), especially as strains evolve, become more aggressive and cycle faster. Early action to keep crops clean from the start is widely recognised as crucial, and so, elicitors could play an important role in slowing disease progression even of new, more aggressive genotypes.

Elicitors work by mimicking an attack on the plant to 'prime' its natural defence mechanisms, thereby boosting protection against fungal

threats including late blight. Individual products achieve this in various ways (see box), and when used preventatively early in the programme, can make a genuine difference to late blight protection, suggests SRUC senior plant pathologist, Neil Havis.

Importantly, this activation of defence mechanisms applies to foliage present at the time of application and new leaves emerging afterwards, although the longevity of protection varies depending on disease pressure, he adds. “You can reapply most products to trigger the defence mechanisms



## Preventative action

SRUC's Neil Havis says elicitors should be used before a pathogen arrives to induce a response and 'prime' the plant ready to repel attack. ▶

## Biostimulant boosts potato resilience

Status not only improves potato yields, but can also play a role in protecting against abiotic stresses during the bulking period

**T**he latest results from a series of trials indicate that applications of Status (MTU+ pidolic acid) deliver a typical yield increase of 10% in potatoes, rising to more than 40% in seasons with low rainfall and high temperatures.

According to IntraCrop's technical officer, Emily Way, MTU (1-(2-methoxyethyl)-3-(1,2,3-thiadiazol-5yl), is a single molecule technology shown to increase the activity of photosystem I in a range of crops.

"This helps to protect the photosynthetic apparatus of the plant during stress conditions, improving its ability to produce energy and sugar while increasing chlorophyll content to keep it greener and photosynthetically active for longer," she explains.

"We've actually seen MTU increase

chlorophyll levels by as much as 20%. The more chlorophyll there is, the greater the rate of photosynthesis, the more CO<sub>2</sub> assimilation takes place, the more sugars are produced and the healthier the crop is."

According to Emily, the process also improves nitrogen use efficiency (NUE) by increasing the carbon:nitrogen ratio in the plant, as well as building the resilience required to overcome abiotic stresses.

"In trials with wheat, for example, leaves exposed to periods of drought, heat or salinity show those treated with MTU remain green for longer and recover much better when the stress is removed," she adds.

MTU's efficacy is significantly enhanced when it's paired with pidolic acid, a signalling compound at the heart of the nitrogen assimilation

cycle, suggests Emily. "Pidolic acid increases the production of glutamic acid, which combines with ammonia to form glutamine which is a building block of many amino acids and further helps improve plant growth."

When it comes to potatoes specifically, independent replicated trials carried out by Dyson Farming Research during 2025 indicate the product delivers substantial yield improvements in potato crops exposed to environmental stress.

Two field experiments, one on irrigated heathland with the variety Elland, and one on siltland with Caledonian Rose, were assessed, explains Emily.

"The 2025 potato growing season was certainly challenging with multiple heatwaves, high transpiration rates and lack of rainfall creating

Ed Scaman,  
Bayer Technical  
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### Real results

According to IntraCrop's Emily Way, MTU can increase chlorophyll levels by as much as 20%.

conditions that were difficult for crop growth, disrupting tuber bulking and impacting overall yield.

"This was very much the case at our two trials sites providing a great opportunity to evaluate the effects of Status. On the irrigated heathland site, mid-season stress caused untreated plots to stall, with no further increase in tuber weight.

"However, the Status-treated plots maintained bulking at a reduced but sustained rate, resulting in a 26% yield uplift, from 66t/ha to 83t/ha."

Emily points out that at the siltland site, early-season stress limited total yield potential across the board. "However, the treated plots delivered a 41% increase in final yield, rising from 32t/ha in untreated plots to 45t/ha.

"These results support findings from trials carried out with a large potato processing company where Status applications

increased yields from 77t/ha to 87t/ha – a 13% gain."

Status is a unique mode of action and carries the CE mark under the EU Fertilising Products Regulation, and is approved for broadacre arable crops as well as woody perennial crops, vegetables, ornamentals, aromatic and medicinal plants.

"That level of validation is pretty unusual in an area of technology often high on claims but light on credibility and science," raises Emily. "But as our climate is becoming more variable and extreme than previously, and growers face increasing challenges, such proven routes to improving resilience will become increasingly important.

"The evidence of real-world results and credibility around MTU continues to grow and is proof that such technologies can deliver tangible benefits in a very unpredictable future," she concludes.

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# ROOTS Potatoes



## Integrated disease management

While elicitors aren't a replacement for conventional fungicides, they could form a useful part of integrated control strategies.

again, but generally, the greatest response is from the initial treatment."

Research in other crops suggests there could also be a trans-generational benefit from some elicitors, where enhanced disease defence is passed to progeny in seed, highlights Neil.

"We've seen it in oilseed rape, for example, where we induced a defence response to clubroot and found the seed sown from that crop was more resistant. It's not something we've looked at in potatoes yet though."

While elicitors aren't a replacement for conventional fungicides, they could form a useful part of integrated control strategies, especially early in the season, he says. "They should be used before the pathogen arrives to induce a response and 'prime' the plant ready to repel any attack."

Doing so may, therefore, reduce the pressure on early chemistry. However, in many cases, a partner fungicide will be included with the elicitor to control any disease present, and applications will be followed by a robust spray programme, explains Neil.

With fewer conventional fungicides available, and a desire to alternate



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products and modes of action to mitigate resistance risks and tackle new strains, having elicitors as an extra option could help to prolong the longevity of chemistry, adds Lawrence Veryser, Certis Belchim laboratory trialist.

Lawrence was one of the team that discovered the elicitor properties of valifenalate (available in co-formulation with cyazofamid

as Areli), that help to boost blight protection, and mitigate the risks of selecting for resistant populations.

Furthermore, research by Certis Belchim supports the argument that elicitors can help control new, more aggressive blight strains. In trials comparing the effectiveness of Areli against a moderately aggressive EU36 and a very aggressive EU43, there was a notable advantage against the more aggressive strain, notes Lawrence.

“Although valifenalate is a CAA inhibitor fungicide, to which there is known resistance in EU43, we’ve seen that it’s still bringing added value compared with using cyazofamid on its own,” he adds.

The reason for this is that aggressive blight pathogens have evolved to target ‘easy wins’, where they can get into the plant quickly and multiply rapidly, explains Lawrence.

“By using an elicitor that makes it harder for the pathogen to get into the leaf in the first place, it’s more likely to be killed on the surface by other environmental conditions such as UV radiation or dryness.

“By using elicitors regularly within blight programmes, we may even be able to slow down or stop the selection of these more aggressive strains, which would be sustainable for the whole sector in the long-term.”

With an ever-changing blight population featuring resistance to some key actives, Neil believes any tools, such as elicitors, that can support and protect existing chemistry to prolong its future use, are a critical ‘building block’ of integrated management strategies.

“Because elicitors aren’t specifically targeting one chemical process like many fungicides, it’s unlikely the pathogen will completely overcome the defence mechanisms induced in the host plant.”

Although valifenalate is a CAA

inhibitor, Neil says any additional benefits from its elicitor properties should be taken into consideration. “Think of the bigger picture when it comes to managing blight. IPM requires

us to use as many different products and approaches as we can, so why not use elicitors as part of that?

“Chemistry is still at the top of the IPM pyramid, but we

have to support it with everything else available, whether that’s elicitors, blight monitoring, or cultural controls. If we have something that can elicit a defence response, that can only be a good thing.”

**“If we have something that can elicit a defence response, that can only be a good thing.”**



### Heightening control

By using an elicitor that makes it harder for a pathogen to get into the leaf in the first place, it’s more likely to be killed on the surface by other environmental conditions, highlights Certis Belchim’s Lawrence Veryser.

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► The co-formulation of cyazofamid with valifenalate endorses FRAC advice to use actives in combination, and only in curative situations may any additional mix partner be required.

According to Neil, the way elicitors prime plants to resist fungal attack means their benefits aren't exclusive to late blight. "Strengthening cell walls or producing anti-microbial compounds will help against any fungal pathogen that lands on the plant."

Indeed, Lawrence says research suggests Areli could potentially offer some benefit against alternaria, for example. The reason for this is that valifenalate induces the expression of a particular protein (a chitinase), which binds to chitin in the cell walls of alternaria, inhibiting spore germination and hyphal growth.

"Chitin isn't present in phytophthora, but it is in alternaria, so even though Areli isn't registered for controlling alternaria, it does have potential for some side efficacy against these potential threats."

Some may worry that stimulating plants to divert more energy into disease defence rather than growth

## Elicitors explained

Elicitors offer purely protectant activity, so must be applied early, before disease is present, and are often paired with a fungicide to tackle any disease that's already there.

Individual products work differently, but there are two main ways elicitors prime plant defences, namely:

- Systemic acquired resistance (SAR) – influences the release of a defence hormone (salicylic acid) that regulates various functions within plants, affecting growth, development and stress tolerance. This can include strengthening cell walls, enhancing chlorophyll and activating enzymes.
- Induced systemic resistance (ISR)

– where the production of protective chemicals and enzymes is enhanced to degrade fungal pathogen cells.

Valifenalate works by binding to the plant's pathogen recognition receptor (PRR), effectively tricking it into thinking it's being attacked. This sends a signal to the cell nucleus to produce salicylic acid, which increases production of different 'PR (Pathogenesis-Related) proteins', some of which are anti-microbial to destroy spore cells, while others increase lignin production in cell walls to build a stronger physical barrier.

Laboratory work supervised by Certis Belchim's Lawrence Veryser and his team has successfully measured the expression of these PR proteins in response to treatment with valifenalate, showing a clear increase compared with other chemistry.

and development could result in a yield penalty, however, Neil points out that research suggests this isn't the case.

"What we did find in cereals, is a varietal effect, with some

varieties responding to elicitors better than others, however we don't yet know whether there are similar varietal differences in potatoes," he concludes. ●



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