

Alternaria – another evolving threat?

“Crop health is a factor in early blight disease onset.”

Roots Potatoes

Early blight has become a more significant disease in some varieties in recent years. New research in Europe warns that it's also a disease that is evolving into something that's more aggressive and harder to control. *CPM* finds out more.

By Rob Jones
and Lucy de la Pasture

Across Europe, growers are being encouraged to give greater thought to how they protect crops against early blight (*Alternaria spp.*), also known as target spot, following the detection of isolates showing reduced sensitivity to fungicides belonging to the Quinone outside Inhibitor (QoI) group of fungicides.

Speaking at the Bayer potato conference from his office in the

Netherlands, Bert Evenhuis of Wageningen University and Research, reported that a novel genotype of *Alternaria solani* has been shown to be more aggressive than wild relatives and less well controlled by products containing pyraclostrobin, azoxystrobin and famoxadone.

Rising threat

The rising threat of early blight has increased steadily since the turn of the century as a changing climate has created conditions more favourable for the disease, he explains. Efforts to protect crops have led to the increased use of fungicides and, in some cases, this has resulted in reduced sensitivity to certain modes of action. This has been hastened by a lack of breeding focus on alternaria resistance in new varieties.

Isolates with reduced sensitivity to QoI fungicides were first detected in Germany by researchers at the Technical University of Munich and more recently in the Netherlands and other European countries. New research in Europe has also just identified reduced sensitivity to some SDHI active substances, particularly boscalid.

The challenge facing growers is that

they're dealing with two distinct species that make up the alternaria complex when seeking to protect crops.

“Early blight is caused by *A. solani*, the principal pathogen threat and by *A. alternata*, a secondary threat that enters the plant via earlier damage. Both species can be found wherever early blight is detected,” says Bert. ▶



Bert Evenhuis says that alternaria pathogens are evolving to be more aggressive and with insensitivity to some active ingredients.

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The challenge facing growers is that they're dealing with two distinct species that make up the alternaria complex when seeking to protect crops.

► Data on the prevalence of *Alternaria spp.* or their sensitivity to fungicides in the UK is sparse, but it's a disease that's present in most seasons.

"The two species are virtually indistinguishable in the field, but *A. solani* is the more damaging as it produces bigger lesions and can infect crops without first needing an entry point caused by an unrelated event. Most varieties have good tolerance to *A. solani*, but Markies, Ramos, Lady Christl and Aveka have been found to suffer problems and other varieties might be affected too."

As with programmes for late blight (*Phytophthora infestans*), interventions should be timed before the disease pressure begins to build. Achieving this in

practice is often difficult because predicting the onset of disease is notoriously hard, he says.

"Developing more accurate decision support systems will be essential to promote protection against both early and late blight. The early systems lack the capacity to consider crop development, crop stress and the presence of other diseases which can hinder protection practices, so further work is needed."

Production practices, especially nutrient availability, have been found to have an impact on disease development but more work is needed to fully understand this relationship, he adds.

"We've seen that crop health is a factor in early blight disease onset, especially

Quantis can help heat-stressed potatoes

Syngenta has joined the biostimulants race by launching Quantis, a biostimulant product which helps crops cope with the impacts of heat stress.

Quantis has undergone extensive field trials in the UK and analysis of the data has revealed significantly increased yield for crops that had been under prolonged or extreme heat stress. The results indicate the product may have an important role in potato agronomy programmes from tuber initiation until the end of the crop bulking phase, believes Dave King, head of technical at Syngenta.

He adds that its value is even more apparent with the increasing incidence and severity of heat events that's become a feature of British summers over the past few seasons.

Quantis delivers a readily available blend of organic carbon, amino acids, potassium and calcium that supplement the plant's own molecular cell function, explains Dave.



Several years of trials in the UK suggest that Quantis can give crops significant help in overcoming the effects of prolonged heat stress.

"Acting directly as an anti-oxidant, it can help to counter reactive oxygen species (ROS — free radicals) which can cause significant damage, particularly within the foliage if leaves get too hot. It's believed to activate and enhance the potato plant's natural capability to adapt to heat stress to prevent damage."

The strength of Quantis lies in its relatively high proportion of short chain carbon molecules, which are particularly effective at helping the plant to prevent the creation of ROS during periods of stress, he explains. It also helps with the scavenging of accumulated ROS to minimise their adverse effects.

"By filling the organic carbon gap when a plant comes under stress, Quantis can act to minimise stress effects. It also contains a level of amino acids that can help to protect plant structures from nitrogen and protein degradation when under stress."

In addition, Quantis provides osmoprotectant regulators to help plants manage cell osmosis, which could help contribute to the heat stress mitigation, he adds.

Trials have shown best results from three applications at a rate of 2.0 l/ha, at the onset of tuber bulking; a second two weeks later and third at canopy closure. Last season, at 32 trials sites which experienced conditions of greater than 25°C for more than four hours on 14 days (or more) from the first application through to 31 Aug, yields were, on average, 2.2 t/ha greater than the control. The 14 sites that experienced a heat event in excess of 30°C over that period recorded an average 1.9 t/ha yield increase.

In previous years, the greatest effects on yield and tuber size were recorded in 2018, which coincided with an extremely hot and stressful growing season, he recalls. "It was notable from



Dave Kings says Quantis is believed to activate and enhance the potato plant's natural capability to adapt to heat stress to prevent damage.

in-season assessments that effects were apparent in the second phase of tuber bulking, when the crop came under extreme stress."

Reviewing historic weather has shown the variability in heat events — from season to season and by location — but at some stage most crops will be subject to some effects. As climatic conditions have changed over recent years, extreme and prolonged heat periods are becoming more frequent, he points out.

Continued Syngenta field research in 2021 will look at refining application timings. More controlled trials will also seek to tease out differences between varieties and other variables, such as irrigation and crop duration.

Syngenta's New Farming Technologies team is pioneering predictive heat forecasting models, with the aim to identify potential for precision targeting of applications prior to stress periods in the potato growing season.

New Syngenta-funded research at Nottingham University will also investigate how Quantis is working to alleviate heat stress and drought effects in more depth, he adds.

Real Results extends into potatoes

BASF has traditionally been a relatively small player in the potato sector, but a shift of focus has elevated the crop to more prominence in the manufacturer's portfolio. This is reflected by a burgeoning pipeline of new actives on course to growers over the next few years, says Matt Goodson, specialities marketing manager at BASF.

"In the near future we have three new fungicides for late blight, alternaria and tuber diseases; two herbicides — one for grassweeds, the other for broadleaf weeds; and two insecticides, which include a biological for wireworm and an aphicide."

The company has just launched 'Perfecting Potatoes Together' — a platform which will provide a collaborative and holistic approach in

developing solutions to the agronomic problems facing growers, using both cultural methods and chemistry.

"The success of Real Results in cereals has helped us to understand the challenges for growers. As an R&D company it's easy to be out of touch with what's happening on the ground, so by working with potato growers and industry experts, it will help BASF be connected during the product development process. In this way, we can be sure the new products fit in and growers can get the most out of them."

BASF are inviting potato growers to join them on their journey and help shape the company's product strategy for the future. As well as networking with like-minded growers, the Perfecting Potatoes Together initiative will



BASF is extending its Real Results circle into potatoes to help fine-tune their new product pipeline.

provide expert help on producing crops, innovation trial sites and its Real Results programme will give participants the opportunity to trial innovations on their farms under real world conditions.

www.agricentre.basf.co.uk/real-results/potatoes

where nitrogen availability is restricted. This can be through low application rate or low soil reserves. This is another reason to favour split applications to promote canopy growth and delay senescence, but beware that too much, too late can impair tuber quality."

Control options for early blight have been falling by the wayside so the approval of a new product with strong activity on alternaria will likely be welcomed by growers given the uncertain future for mancozeb, which has been the mainstay for controlling the disease.

Caligula, a new fungicide from Bayer containing 125 g/l fluopyram and 125 g/l prothioconazole in a suspo-emulsion (SE) formulation, was launched by Bayer at their conference earlier this spring. Caligula has demonstrated a level of protection against early blight in trials that looks set to secure it one of the highest ratings of any product on the Euroblight early blight league table, believes its manufacturer.

"While late blight is regarded as the bigger threat to crops, early blight is a disease of increasing significance in the UK," explains Grant Reid, Bayer commercial technical manager for central Scotland.

Increased prevalence

The reasons for its increased prevalence aren't fully understood but it's thought to be due to a combination of factors, including the introduction of more susceptible varieties, the spread of *A. solani* isolates less sensitive to Qol fungicides, and more favourable weather in the early spring supporting sporulation.

The damage alternaria inflicts on crops varies according to the season. In the published research, measured losses in unprotected crops may be from 5 to 78% — depending on the extent of canopy defoliation.

"In registration trials spanning six seasons between 2013 and 2018, Caligula was compared directly with programmes

featuring Narita (difenoconazole), Amistar (azoxystrobin), or Signum (boscalid+ pyraclostrobin)," says Grant.

When applied in a preventative sequence at 14-day intervals, Caligula delivered 84% control of early blight in the susceptible phase of the crop. Comparable treatments with Signum achieved 47% of control, whereas Amistar delivered 68% control and Narita 80%. The average extra yield from Caligula over all other treatments, delivered by this higher-level control, was 3%.

"Trials also considered its incidental control of sclerotinia compared with Shirlan (fluazinam). A preventative sequence of Caligula treatments delivered a 30% reduction of stem infection by sclerotinia, whereas a similar sequence with Shirlan resulted in an 11% reduction. A Caligula sequence resulted in significantly lower incidence of sclerotia within stems (94% control, recorded in one trial), compared with a 40% reduction for fluazinam," he adds. ■

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