Rethink beet disease control?

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Roots
Sugar beet disease

The 2020 season threw up some massive challenges for disease control in sugar beet. *CPM* examines how the experience may prompt changes to traditional spray programmes this summer.

By Paul Spackman and Lucy de la Pasture

After a slow start to the season, sugar beet, like many other crops, has raced through growth stages and caught up quickly over recent weeks. So with good soil moisture, decent establishment and far less aphid pressure than last year, yield potential generally looks promising.

Keeping crops healthy and free from foliar diseases is key to fulfilling this potential. It maximises the photosynthetic capacity of canopies while the sun is at its strongest, thereby helping plants build root mass and sugar content well into the autumn.

Traditionally, rust and mildew have driven beet fungicide decisions in the UK's maritime climate, with the first treatment usually applied at the onset of disease symptoms around mid- to late-July. However, unusually widespread issues with cercospora last season could complicate decisions if similar conditions favour the disease again, believes Farmacy agronomist Peter Riley, based in Norfolk.

Summer 2020 was something of a 'perfect storm' for cercospora, as hot weather followed by heavy rain in mid-August created ideal conditions for the infection of crops, many of which were already struggling against unprecedented levels of virus yellows. This highly infective period also fell between the first and second fungicide applications on many farms, meaning some crops may not have been as well protected as they could have, he highlights.

Little protection

"Last year, virus wiped off a lot of old leaves which had been treated with the first fungicide — as new leaves emerged, they had little protection and were more at risk of infection," notes Peter. "It was virus yellows that did the main damage to many crops yields last season, but cercospora finished some of them off."

Early intervention at the first signs of infection is vital to prevent any foliar disease from becoming established, especially as control options become more limited, either due to regulations or fungicide resistance.

While the weather favoured cercospora last season, problems may have been made worse by an element of complacency within the industry that meant the threat was not tackled until it was too late, says Darryl Shailes, Hutchinsons' root crop technical manager.

Cercospora was first identified in the UK in the 1930s but is more common on the continent. Until 2020 it had been an incidental disease in most of the UK, with rust and mildew being dominant. "But where crops had been treated with a more continental-type programme, they suffered less," he says.

"In the rest of the world cercospora is the dominant disease, so we need to learn from them. They have the advantage of resistant varieties being developed and more contact protectant fungicides, but DMI's are still used widely. We only have sulphur available to us as a broad-spectrum fungicide, but trials do indicate its addition will help."

Daryl explains that cercospora presents a double whammy to the fungicides available for disease control in the UK. "The trouble with this disease is its resistance to strobilurins, which are the mainstay of the rust and mildew programme in this country, and its aggressiveness against the DMI (or triazole) group of actives. This means the DMI component in fungicide programmes is less persistent than it is against rust and mildew and the strobilurin part has no effect."

He believes the traditional approach to summer beet fungicides where the first spray is applied in early July and is followed up a month later, should be adjusted — with growers being preprepared to act quickly on any warnings that come from the BBRO's new cercospora alerts.

The warning system, similar to the AHDB's blight forecast, is based on a Daily Infection Value (DIV) which is calculated using daily temperature and humidity figures to indicate ▸

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Darryl Shailes says the difficulty with cercospora control is the lack of fungicides available with efficacy against the disease.

▸ when conditions are suitable for infection. If the relative humidity is more than 90% for seven hours on two consecutive days when temperatures are also favourable, then there's a high risk of cercospora developing.

In high-risk situations, it may be necessary to apply strong DMI-based products at shorter intervals to take out disease as soon as it appears and protect crops until the next treatment, says Darryl.

"We know from work on the continent that making applications at the earliest sign of infection is key to good control, so in high disease pressure situations an intermediary spray may be required if symptoms occur between the main fungicide timings," adds Peter, who acknowledges this can pose a logistical challenge at such a busy time of year.

While it's important to be alert to the cercospora threat, rust, powdery mildew and ramularia remain the primary disease pressures in more typical, cooler and wetter UK summers.

"For many growers in this region, brown rust has been the more prevalent disease in recent years, and we've found that the onset of disease, and therefore the first fungicide application, has crept forward slightly," he says.

Given the necessity to keep spray intervals to 28 days as a maximum, that may have implications for following sprays to avoid products running out of steam and letting disease in. "Brown rust can defoliate a crop incredibly quickly, so the aim is to keep a good, clean canopy all the way through the season."

Disease pressure

For late-lifted crops, that may mean applying a third or even fourth fungicide, depending on disease pressure and the scheduled lifting date, he says. "If disease is allowed to establish and crops lose leaves, they will start producing more new leaves and this uses up valuable energy from the root. Any new leaves will also be unprotected by fungicides."

He also notes that fungicides should be applied when crops are turgid, so the timing is application is important to avoid periods when the crop may be wilting.

Two products — Escolta (cyproconazole+ trifloxystrobin) and Mirador Xtra (azoxystrobin+ cyproconazole) — have been the mainstay of many sugar beet fungicide programmes for several years.

Cyproconazole and strobilurins are both effective against brown rust and mildew, with some useful activity against cercospora. But the removal of authorisation for cyproconazole means both products will be lost from the armoury beyond November 2022, further limiting the options for grower, explains Peter.

Epoxiconazole has also been withdrawn, but any supplies that remain on-farm can still be used before the final cut-off date, although growers should check revocation dates carefully as they do vary, he warns.

Fungicides should be applied to turgid crops for best effect so aim to spray in early morning during hot weather.

Peter says good alternative options are coming through the pipeline though, including a new flutriafol-based fungicide with label approval for cercospora and ramularia control. There's also an azoxystrobin+ difenconazole co-formulation, which in French trials has shown efficacy against cercospora, despite strobilurin resistance.

Finally, he reminds growers of the importance in ensuring crops remain well-nourished and healthy, which improves their resilience to stress or disease. Magnesium, manganese and copper are particularly important, so a foliar treatment may be worth including with the main fungicide where required, he notes.

BBRO trials last season suggest there may be some differences in the susceptibility of different varieties to cercospora, which Peter believes growers can use to help prioritise crop inspections and treatments should conditions favour the disease.

Strip trials at Bracebridge Heath in Lincolnshire and Thorney in Cambridgeshire, suggest varieties could be grouped into three categories based on the severity of symptoms, although the BBRO acknowledges the trials were not specifically looking at cercospora, so other factors may also have come into play. Observations from the Beet Yield Challenge last season indicated that varieties selected for later harvesting with higher rust ratings on the BBRO/BSPB Recommended List, maintained healthier canopies where cercospora was also present in crops. Work is continuing this season with more intensive monitoring of untreated varieties in the RL trials for cercospora. ■

What to look for

Cercospora overwinters on infected beet, old leaf residue in the soil and on some weeds, such as bindweed. During periods of warm temperatures (20-26°C) and high relative humidity (>85%) the fungus produces conidia which then spread, primarily by wind.

Conidia land on leaves and germinate when conditions are suitable (warm and humid). Symptoms on leaves may become apparent 5-20 days later, depending on conditions. At the very early stages of infection, beet leaves may still look fairly healthy, explains Dr Kate Oram, research assistant at BBRO.

"In early stages of infection, cercospora lesions can be quite small but these can expand to about 3-5mm as the infection progresses. Classic symptoms are small, circular lesions with light brown or grey area in the centre surrounded by a very definitive reddish ring," she explains.

Classic symptoms of cercospora infection

"In time leaves become yellow and eventually whole areas may turn brown. Under the microscope it's possible to see black spots in the centre of lesions which are spores."

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