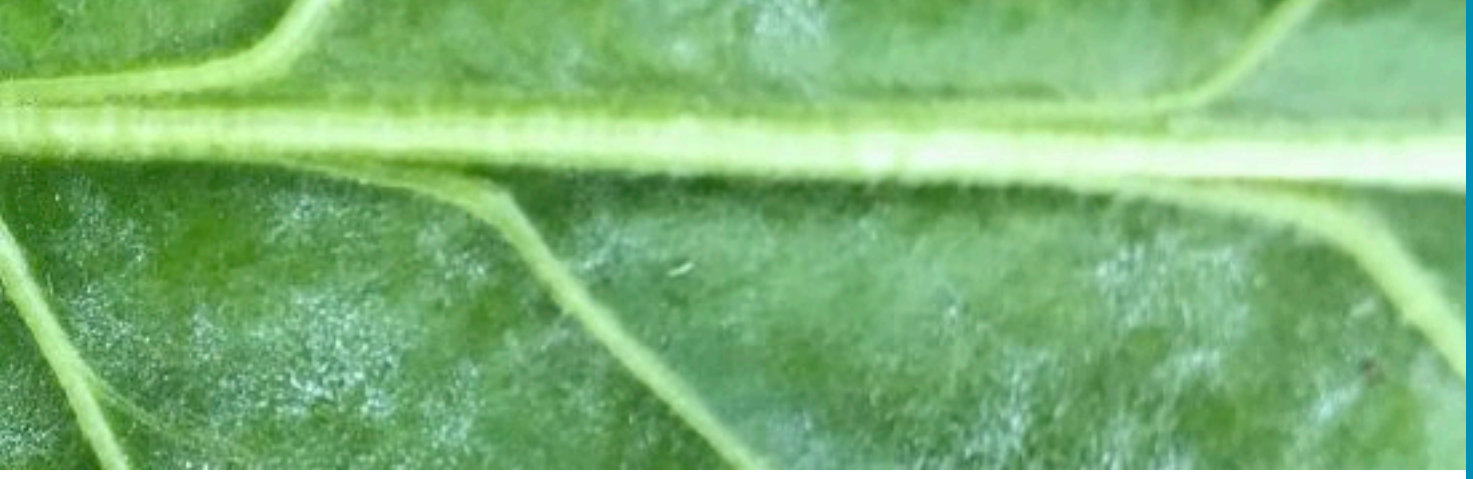
Foliar disease control

Foliar disease can be challenging especially with cercospora infection increasing and the impact of climate change. Whilst we focus on cercospora, it is vital that we don't lose sight of the overall key actions that should underpin your foliar disease control programme.

Eight-point plan for autumn disease management

1. Know what disease(s) are in your crop in order to select the best fungicide options (see back pages for available fungicides).
2. Cercospora leaf spot appears to be an increasing problem in the UK and strains of this fungus are potentially resistant (due to QoI resistance) to strobilurin fungicides. If in doubt contact the BBRO for help with disease identification.
3. As seen from previous BBRO trials, do not apply fungicides too early, wait for early symptoms to show.
4. Conversely, do not apply products too late otherwise effective disease control will be difficult for the remainder of the season.
5. Always follow label recommendations for applying products at the correct growth stage.
6. Ensure the gap between the first and second, or second and third applications, is kept to within 28 days to prevent significant re-infection occurring between treatments.
7. Ensure water volume recommendations are adhered to and are not cut back.
8. Know where specific varieties are sown within fields to monitor any variety-disease interactions.



Cercospora leaf spot

Cercospora leaf spot has become more established as a prevalent foliar disease in the UK over the last few seasons. The characteristic circular spots or lesions associated with the disease are quite distinct and typically once more than 5% of foliage is covered, there is an economic loss with root weight, sugars and impurities affected. Under conditions of high temperature and rainfall, cercospora spreads very rapidly increasing both in incidence and severity of symptoms. High levels of leaf wetness are associated with rapid disease progression. Severe infection can result in significant loss of the canopy. Plants often respond by producing leaf re-growth which is associated with a loss of sugar content in the root.

A BBRO study has shown that there are isolates of the fungus that are resistant to fungicides and traditional sugar beet fungicides may not provide sufficient levels of control. Isolates collected in the Cambridge area showed resistant to strobilurins and some insensitivity to the triazoles.

When: Mid July to October

Symptoms: Circular spots 3-5mm in diameter with necrotic, tan-grey coloured centres and reddish-brown border. Spots coalesce, leading to severe defoliation

Risk: Warm wet weather, with temperatures above 25°C

Severity: Potentially an increasing problem in the UK due to the increase in annual summer temperatures. In other countries yield losses have been known to exceed 50%

Advice: Increasing resistance to strobilurin and triazole products is limiting the effectiveness of fungicide control programmes against this fungal pathogen

The fungus overwinters on infected beet, old leaf residue in the soil and on some weeds such as bindweed. During warm (20-26°C) and humid (90-100%) weather, the fungus produces conidia which are then spread, primarily by the wind. Conidia then germinate and develop lesions on the leaves. Again, warm temperatures, 25-35°C and high humidity (90-100%) and/or high leaf wetness are key.

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Cercospora control strategy

- The reduction and removal of sources of infection from previously cercospora-affected crops is important. Leaf residue/trash, groundkeepers, growth on spoil heaps and weed beet can be sources. Survival has been shown to be greater following shallow tillage compared to deeper or inversion tillage. Where beet has been grown in close rotation (less than 4 years) there will a higher risk of disease carry over. AD beet, especially those crops left in the ground for longer will also carry a high risk of being infective sources.

- Monitoring the weather is vital to predict initial infection. BBRO will provide regular updates on this during 2022, using a network of in-crop weather stations and weather forecasts. Information will be posted on the BBRO website in the BBROplus section via regular editions of the BBRO Advisory Bulletin.

- Ensuring crops are protected in high-risk periods will be key. When high risk periods are predicted, crops should be monitored closely for the first sign of symptoms. Fungicides should be applied at the first signs of cercospora symptoms and not before.

- Keep the interval between fungicide applications to within 28 days when the risk remains high. It is likely that more than two fungicides will be required. This will depend on the interval between sprays (weather-related risk) the susceptibility of the crop, and the harvest date.

- Crops affected by other diseases, drought stress and in particular virus yellows are likely to be more susceptible to cercospora.

- If the crop is wilted, remember that fungicides are more effective when applied to a turgid hydrated canopy.

There are differences between varieties in their susceptibility to cercospora. BBRO provides information on the varietal susceptibility. Check the BBRO website https://bbro.co.uk/on-farm/cercospora-risk/.

There are new fungicides targeted for the UK from 2022 onwards. Trials have shown that these will provide more effective control of cercospora than traditional sugar beet fungicides. BBRO will release the latest information on these when they become available.

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Foliar Diseases

Downy mildew

When: Early spring, potentially recurring in autumn

Symptoms: Heart leaves thicken and become distorted. Undersides of leaves become covered with purple/grey downy spores. This spreads to upper leaf surfaces in wet conditions

Risk: Cool, wet conditions. Optimum temperature of 7-15°C, humidity >60%

Severity: Usually low, although heavy losses have been reported

Advice: Selecting appropriate varieties has been shown to be effective

Powdery mildew

When: July to early autumn

Symptoms: Grey mould on crop, starting on outer leaves

Risk: Mild winters, dry and warm conditions. Low resistance variety

Severity: Potentially one the most yield damaging foliar disease in sugar beet, in the UK. Early infections can reduce yields by up to 20%

Advice: Apply first foliar spray at the end of July/early August as soon as disease infection is seen

Ramularia

When: Mid to late autumn

Symptoms: Angular leaf spots with central silvery cells and sometimes a dark outer margin on older leaves. Spots are larger than those of cercospora

Risk: Cooler (17-20°C) and wet conditions

Severity: Usually very low

Advice: Rarely worth applying fungicides against ramularia alone, but if it is part of a multiple infection then control can be achieved by the use of triazole or triazole plus strobilurin fungicides

Rust

When: July onwards

Symptoms: Small orange/brown pustules on leaf surface, later defoliation can occur after frost

Risk: Damp conditions and temperatures between 15-22°C. Low resistance variety

Severity: Up to 10-14% yield reductions

Advice: Treat as soon as disease appears, this is usually mid-August to mid-September but can be earlier

Silvering Disease

When: May to August

Symptoms: Blue-grey matt colour with increasing silvering of the leaf surface as the leaf grows. Leaf can be seen to crack (similar to hailstone or Silver Y moth caterpillar damage). Occasional yellowing of vein leaves

Risk: Disease caused by a bacterium which appears to be associated with seed. Low number of cases seen in the UK

Severity: Single plants affected, at a low level in-field. Infected beet could yield up to 50% less

Advice: Contact the BBRO Plant Clinic if silvering disease suspected

Stemphylium

When: July to September

Symptoms: Disease starts with small, discrete, irregular yellow spots (0.5-2mm across). The spots begin to die from the centre forming brown spots 1-3mm across. Heavily infested leaves die and more yellow spots appear on new leaves. Progressive leaf loss follows in August to September with subsequent yield loss

Risk: Wet summers (high humidity) and other stress factors (eg BCN or low pH)

Severity: 22% - 42% yield loss shown in Dutch trials

Advice: Send leaf samples to the BBRO plant clinic for identification. If stemphylium is confirmed in your crop, assess the extent of the disease before deciding if appropriate to spray