

TECHNICAL UPDATE 05

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“The weather continues to dominate conversations all over the UK with very changeable and unusual weather patterns. The current conditions have the potential to create a number of conundrums in terms of incoming disease and other potential pest pressures for the UK sugar beet cropping area.

With weed control strategies now complete, it is also important to remember that weeds if not controlled properly can sometimes cause problems later on in the growing season where they can act as alternative hosts in terms of introducing disease into a beet crop, particularly in relation to cercospora leaf spot.”

FOCUS ON DISEASES IN UK SUGAR BEET CROPS

Disease pressures in sugar beet crops are starting to appear due to the recent and very changeable climatic conditions.

Chart 1. Disease and conditions

Pathogen	Latin	Conditions	Temperature / humidity
Ramularia	<i>Ramularia beticola</i>	Cool wet humid	16 – 20°C, humidity 70%
Powdery mildew	<i>Erysiphe betae</i>	Dry and warm	>25°C
Cercospora leaf spot	<i>Cercospora beticola</i> Sacc.	Warm, wet and humid	17 – >25°C, humidity 90%
Beet rust	<i>Uromyces betae</i>	Cool and wet	15 – 22°C



Photo 1. Beet rust (*Uromyces betae*).
Source: Sesvanderhave 2023.

Beet rust (*Uromyces betae*)

Beet rust favours a typical English summer with temperatures between 10 and 22°C coupled with moist conditions. Rainfall can spread the disease within the crop population along with airborne transmission by wind. It is less important as a sugar beet disease as it often appears later in the growing season.



Photo 2. Powdery mildew (*Erysiphe betae*).
Source: Sesvanderhave 2023.

Powdery mildew (*Erysiphe betae*)

This disease appears in most UK beet crops and is favoured by warm, but dry weather. It is one of the more important fungal foliar diseases affecting UK sugar beet crops and can also cause the most significant yield losses.

Ramularia (*Ramularia beticola*)

Ramularia can sometimes be confused with cercospora leaf spot symptoms. However the key differences here are climatic in that temperatures of 17 and 20°C with lower humidity around 70% favouring the development of this beet leaf disease. Another significant key difference is that the conidia in cercospora are darker and in ramularia they are lighter in colour.



Photo 3. Ramularia (Lighter conidia showing in a ramularia infection).

Cercospora and the Importance of Good Weed Control

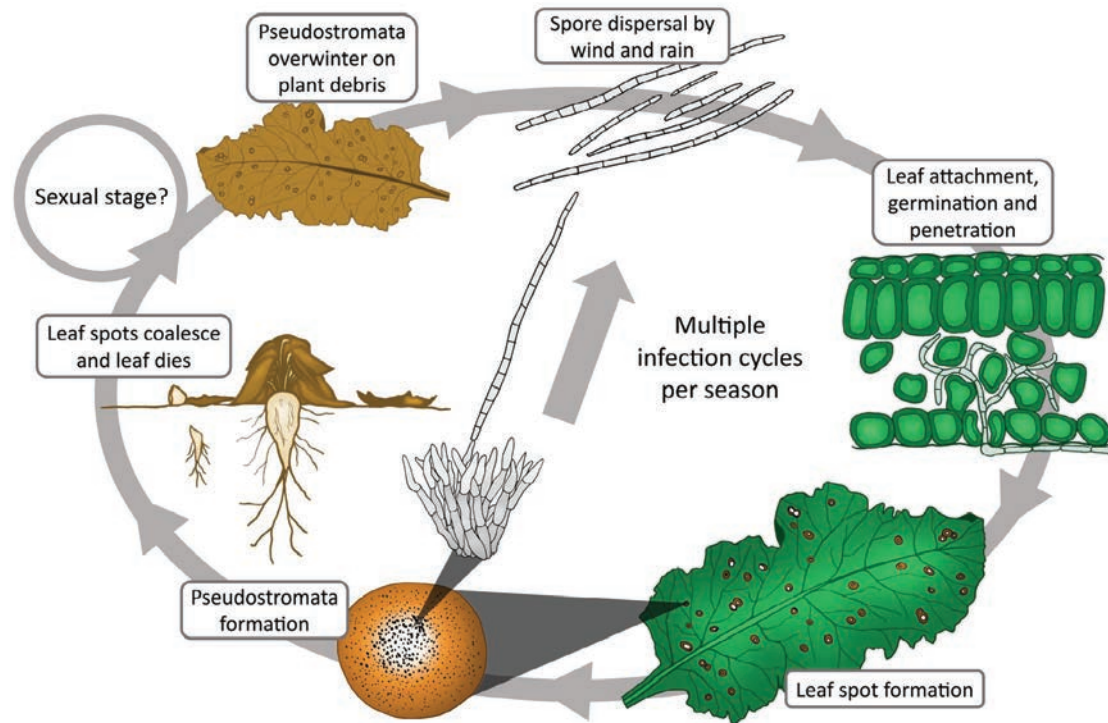
Cercospora leaf spot (*Cercospora beticola* Sacc.) favours high moisture and warmer weather conditions. Cercospora is starting to becoming more common in some parts of the UK and although not currently a major disease in the UK, an increasing number of occurrences are being reported, in particular where the weather conditions are conducive to infection.

The fungal pathogen can survive on leaf debris in the soil profile and the sclerotia-type mycelium can survive for up to two years. One thing to note also is that this fungal pathogen also infects other species of the genus *Beta* which includes a number of Chenopodiaceae species. Therefore, focussing back on weed control earlier in the growing season, can help in terms of controlling pathogen levels, especially in relation to control of fat hen; which can act as an alternative host if not managed effectively.



Photo 4. Cercospora leaf spot.

Diagram 1. *Cercospora beticola* Sacc. Lifecycle



Source: Molecular Plant Pathology, Volume 21, Issue 8 Aug 2020 pages 1005 – 1128.

Chart 2. Alternative hosts of *Cercospora* leaf spot

Family	Common name
Chenopodiaceae	Fat hen
Apiaceae	Celery, carrots and other umbelliferous weeds e.g. cow parsley, wild carrot
Asteraceae	Chrysanthemum, lettuce
Brassicaceae	Wild mustard
Polygonaceae	Some polygonous species e.g. broad-leaved dock, bindweeds, but specifically black bindweed (<i>Fallopia convolvulus</i>)

NUTRITION AND THE BENEFITS TO EARLY LIFTING CONTRACT BEET CROPS

Powdery mildew infection can easily cause yield losses that are as high as those with cercospora leaf spot due to loss of photosynthetic leaf area. However, the inclusion of a micronutrient such as sulphur found in UPL's **THIOPRON** can provide additional benefit to growers who have opted in to British Sugar's early lifting contract this year as it has no harvest interval.

THIOPRON has some useful benefits. In that it provides:

- Excellent rainfastness.
- Preventative curative and eradicator activity.
- Naturally occurring compound.
- Multisite mode of action.
- Useful if used as part of a spray programme in sequence or in tank mixes with other fungicides and some micronutrients as part of a resistant management strategy.

THIOPRON has a full registration as a fungicide for use in sugar beet crops and a tank mix compatibility sheet can be found on the UPL UK website.

REEF NEW PRODUCT FOR SUGAR BEET

REEF containing both sulphur and copper (32% sulphur trioxide + 5.5% copper) is now registered via the fertiliser regulations for use in sugar beet crops for foliar nutrition. The label rate of use is 4.0L/ha with typical use rates being 3.0 – 4.0L/ha.

REEF is an SC formulation that uses the same formulation matrix as **THIOPRON** delivering excellent rainfastness and leaf coverage. **REEF** is fully compatible with a range of other crop protection products including fungicides:

Crop	Max individual dose (L/ha)	Max number of applications	Water volume (L/ha)	Time of application
Sugar beet	4.0	2	100–400	Two leaf unfolded (BBCH12) up to and including beet has reached harvestable size (BBCH 49)
Vines	3.5	2	100–400	From bud burst (BBCH 07) up to the beginning of ripening (BBCH 81)
Cereals	3.0	2	Minimum 100	BBCH 12 – 61 inclusive in the autumn or spring

When to apply:

- When deficiency is diagnosed and also where crops are grown in soils where conditions are likely to cause deficiencies in the crop.
- As a maintenance dressing to maintain optimum crop performance.
- Apply **REEF** at growth stages (BBCH 39-49). A second application may be necessary 2–3 weeks later.

Tank Mix Compatibilities

REEF can be used as a micronutrient at a lower dose on its own at 3L/ha or as part of a tank mix including a fungicide in order to give an additional nutritional benefit to the crop.

Please note that the following tank mixes have been tested for physical compatibility with **REEF** at recommended rates of use and will mix in the sprayer tank. Physical compatibilities may not be approved tank mixes. These tests have not been undertaken to check for any adverse crop phytotoxicity or for the biological efficacy of the individual products when applied as a tank-mix.

UPL Europe Ltd (UPL) accepts no liability for physical compatibilities; therefore use is at grower's own risk. UPL will support the tank mix of **REEF** with any one of the following products.

Fungicides	Active Substance
Angle	azoxystrobin + difenconazole
Caligula	fluopyram + prothioconazole
Consul	flutriafol
Impact	flutriafol
Revystar XE*	fluxapyroxad + mefentrifluconazole
Priori Gold	azoxystrobin + difenconazole
Topguard	flutriafol

*Please note BASF do not support the use of Revystar XE in mixture with any other product in sugar beet.

Tank Mixing Best Practice

Suspension concentrate (SC) formulations are a solid active ingredient dispersed in water and/or other solvents. Prior to use, it is recommended for SC products to be thoroughly agitated by vigorous shaking of the container.

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