

From aphids to whole crop insights

Crop monitoring has been a key part of BBRO's work for decades, but with a very narrow remit to monitor aphids and virus yellows. As we stand in 2026, the importance of aphid monitoring has not diminished but the need for broader scale monitoring has become apparent. The UK sugar beet crop faces challenges from a seemingly ever-expanding number of pests and diseases, the changing climate brings increasingly variable seasons, and regulatory pressures continue to drive to reduce agricultural inputs and use of plant protection products. Together, these factors highlight the need for enhanced crop monitoring systems that can provide timely, field-scale insights to support growers in managing risk, protecting yield, and improving crop resilience.

CropWatch

The CropWatch network was established in 2023 with 12 sites, and by 2025 was up to 20 sites. These are spread across the beet growing region – both to gain representative data from the whole area, and to provide locally relevant data to growers. Each site is equipped with a range of tools and sensors, and field observations are made one to two times per week to monitor a range of pests and diseases, agronomic factors and abiotic stressors.

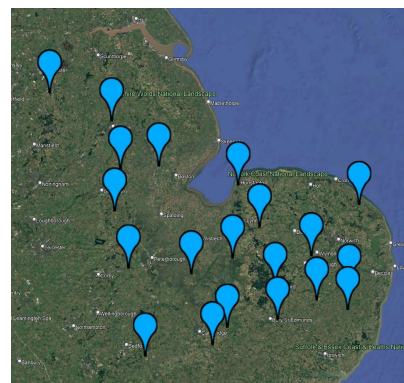


Fig 1. Location of CropWatch sites in 2026 showing distribution across the UK sugar beet growing area.



Weather monitoring

Each site has a weather station (Delta-T Celora weather station) with several sensors which record:

- Rain
- Air and canopy temperature and humidity
- Soil moisture and temperature
- Photosynthetically active radiation
- Leaf wetness

The weather stations provide vital data to support the analysis and understanding of other CropWatch components.

Soil health and nutrition

Soil samples are taken before beet is drilled to classify soil type, organic matter, and give baseline measures of soil pH, soil mineral nitrogen, and macro- and micronutrients.

Plants are sampled 60 days after drilling and tested for macro- and micronutrient levels.

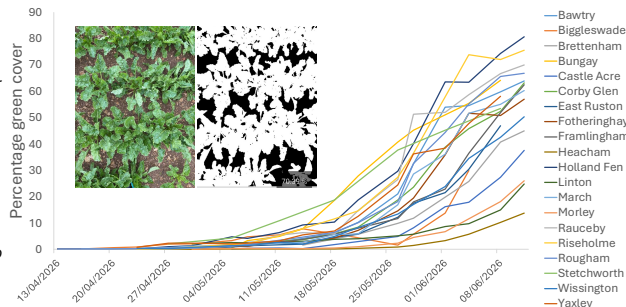
ABIOTIC STRESS

Key agronomic factors about each site are recorded. These include cropping history of the field, tillage practices, drill date, nutrient inputs and chemical applications to the crop.

Canopy cover

Weekly measurements of canopy cover at each site are made using the app Canopeo. This estimates the percentage of green in photographs taken in the field.

Fig 3. Green cover percentage measured over time at each CropWatch site and example results of green cover percentage using Canopeo app (inset photos)



Yield measurements

Fields are sampled before harvest to estimate yield at each site.

AGRONOMY



Fig 4. Yellow water pan

Aphids and Virus Yellows

Migration of winged *Myzus persicae* and *Macrosiphum euphorbiae* at each CropWatch site is monitored using yellow water pan traps which are collected twice per week during the spring aphid migration. Development of green wingless aphid numbers is recorded from

twenty plants at each CropWatch site - and a

further 25 AphidWatch sites to improve data resolution.

Maps of green wingless aphids are published to provide growers with warning to be checking their own crops. VY incidence is also scored in late summer.

Data from this monitoring is used to support and improve forecasting models and IPM strategies.

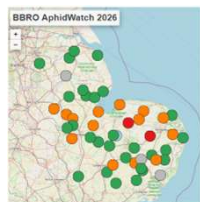


Fig 5. AphidWatch map as is published on BBRO website

Foliar diseases

The predominant foliar diseases in the UK are rust, powdery mildew, and Cercospora Leaf Spot (CLS).

Field incidence of these and other foliar diseases are recorded. Spornado spore traps are also used to monitor patterns of aerial spore dispersal for *Cercospora* and rust. [Poster 5.15](#) has more about spore trapping and CLS management in the UK.



Fig 6. Spornado spore trap

Nematodes

When discussing nematodes in sugar beet, the focus is on those which cause damage including beet cyst nematodes and some species of plant pathogenic free-living nematodes. However, a range of non-plant pathogenic nematodes can also have a significant role in soil health. Soil samples are taken from each site to assess the populations of nematodes present. Further information about this collaborative work can be found on [Poster 5.21](#)

Beet moth

The UK has experienced significant infestations of beet moth in recent years. Automated pheromone traps (xFarm Technologies Delta Pro) are being used to monitor numbers of beet moth each day. These data are used to track both the numbers of moths being caught and the time taken for each generation. More information about BBRO beet moth monitoring can be found on [Poster 5.4](#).



Fig 7. xFarm beet moth trap

PESTS AND DISEASES

With thanks to all the CropWatch site managers:

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