



Issued: 16<sup>th</sup> February 2021

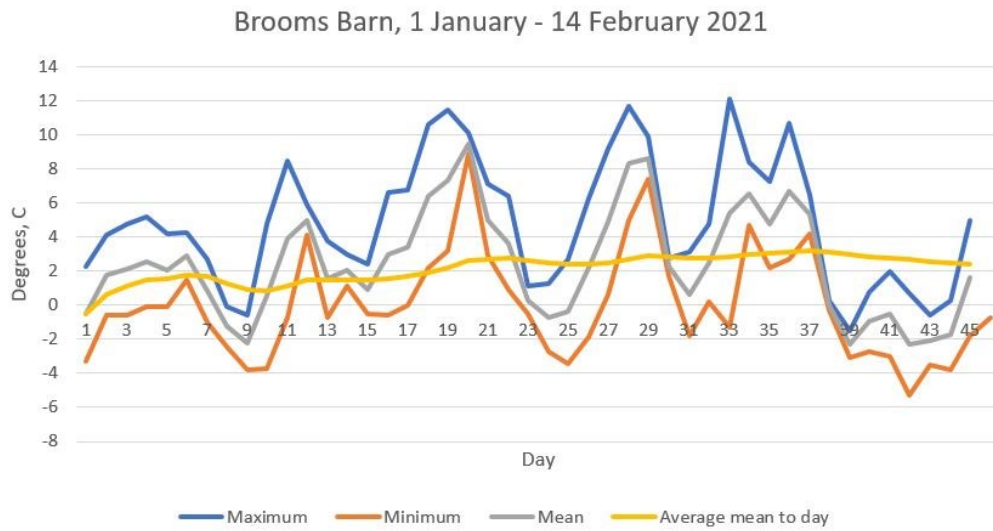


## IN BRIEF

### Impact of cold weather on aphids and the risk of virus yellows

- The wintry weather has had a significant impact on overwintering aphid populations, both reducing their numbers as well as the date of their migration into the 2021 crop.
- It is expected that virus infection in 2021 will be significantly lower compared to 2020 as a result (despite the potential of large numbers of carry-over virus sources). This is great news, reinforcing the fact that freezing weather is one of the best insecticides we have.
- The Rothamsted virus model which is used to predict the proportion of the crop which will be infected by Virus Yellows at the end of August is primarily based on the interaction of winter temperatures with aphid population dynamics. This has been shown to be historically accurate over many years. Last year, 70-90% of the crop was forecasted to be affected by Virus Yellows. The 2021 forecast will be made at the end of February, but it will be significantly lower.
- There is good scientific evidence that demonstrates the effect of temperature on aphids. This science is an integral part of the Rothamsted model. Cold and especially freezing temperatures reduce aphid populations. The LT50 (lethal temperature to kill 50% of the aphid population) is between -6/-7°C. Fluctuating temperatures (many individual frost events) have more impact than constant low freezing temperatures. There have been twice as many ground frosts recorded this winter compared to last year.
- Historically, temperatures in January and February have been shown to be the most closely related to aphid numbers and virus levels.
- To date, a current **average** temperature of <3°C has been recorded during January and February. This is one of lowest average temperatures on record for many years and below the average recorded in 2018 ('Beast from the East' year). 2018 is a good benchmark comparison for what we can expect in 2021. The Virus Yellows forecast (without neonic seed treatment) was for **6.5-9.8%** of the crop to be affected, depending on drilling date and factory area. As 2021 is colder, there will likely be a greater suppression of aphid numbers than in 2018.

Figures 1 and 2 show the actual temperatures for Brooms Barn in 2021 and the accumulated temperatures for 2018-20 and 2021 to date.



Provided by Electronic Rothamsted Archive (eRA), Rothamsted Research

Fig 1: Actual temperatures measured. (We thank the Lawes Agricultural Trust and Rothamsted Research for data from the e-RA database. The Rothamsted Long-term Experiments National Capability (LTE-NC) is supported by the UK BBSRC (Biotechnology and Biological Sciences Research Council, BBS/E/C/000J0300) and the Lawes Agricultural Trust.)

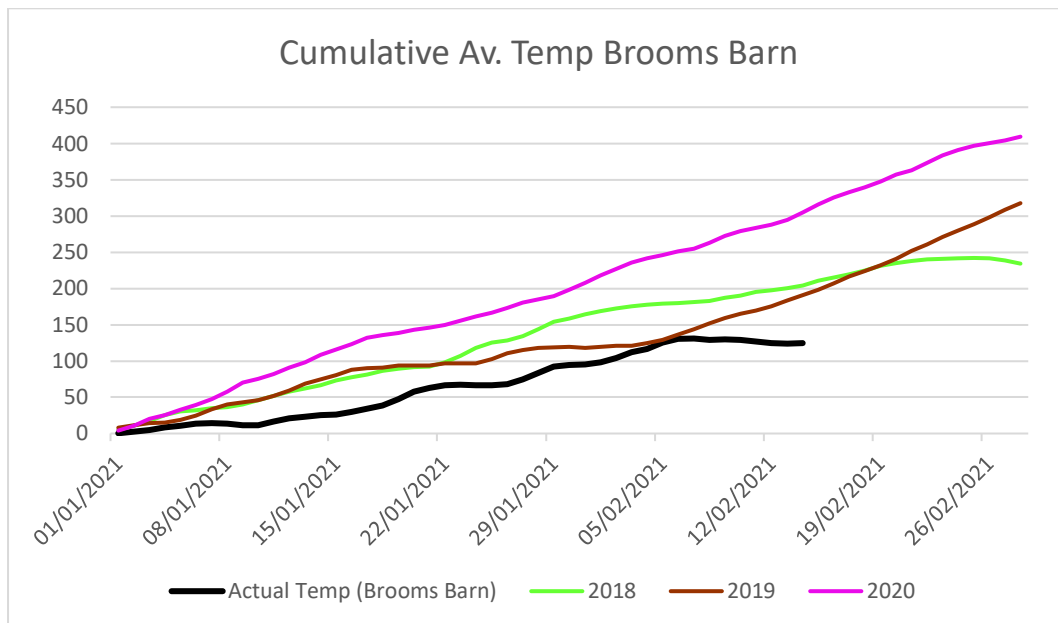


Fig 2: Comparable cumulative temperatures

- The later arrival of aphids in crops this season is significant. Crops planted at normal dates are likely to be more mature and less susceptible to virus. In 2020, with an average winter temperature of 6.5°C, the first aphids were recorded by the end of March. In the cold year of 2018, the first aphids were not recorded in crops until the last week of May, peaking in the first week of July, a good month and half later due to the cold weather. It is expected that there will be a similar effect in 2021 with aphids arriving in late May/early June.
- It is looking increasingly likely that the virus level forecast for the end of February 2021 will be below the threshold (**9% of area affected by VY**) for triggering the Cruiser SB

derogation. Historically, it has been shown that a seed treatment is not needed at this level. It is estimated that there is a 16% chance that the threshold will be reached at the end of February when the official forecast is made. A mild spell during the remainder of February will have a relatively small impact on the virus levels as aphid populations have already been affected by the cold.

- Whilst aphid vector activity will be much reduced following the freezing weather, it remains critical to ensure potential sources of virus are removed, especially before temperatures start to rise as we go into late spring and early summer. Groundkeepers, leaf growth on beet spoil and fodder beet heaps and particularly any energy/AD beet or unharvested sugar beet still in the ground will all be potentially key sources of virus (and foliar diseases such as cercospora too), as soon as the current difficult conditions allow, remove, or manage these virus-infected sources.



## ADVISORY

### Aphid numbers

2020 saw unprecedented levels of aphids and by far the largest number of winged *Myzus persicae* (peach potato aphids) caught in the Broom's Barn suction trap since records began (Figure 3) and is in stark contrast to the numbers caught in 2018 (third point from the right).

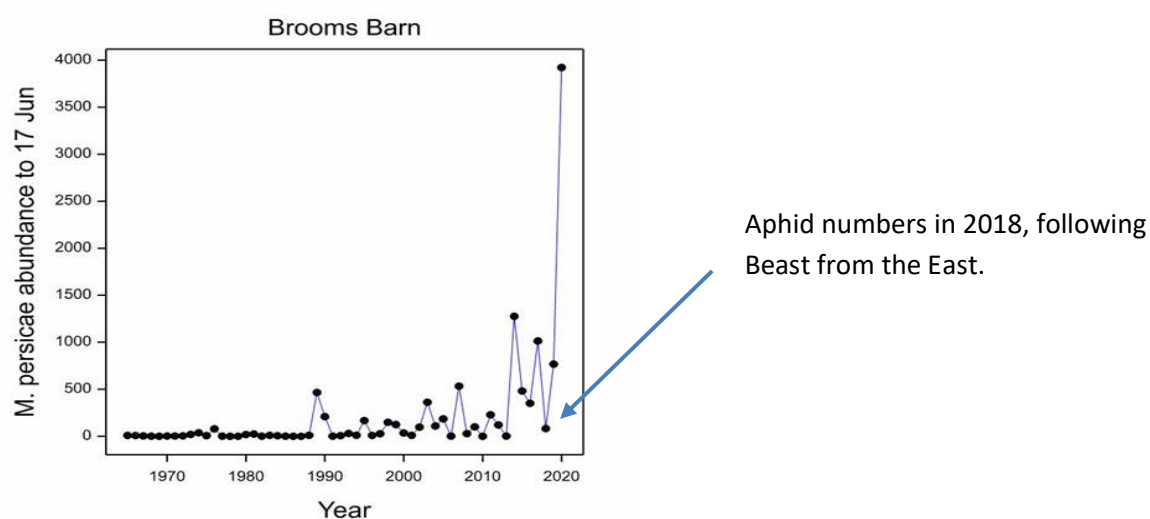
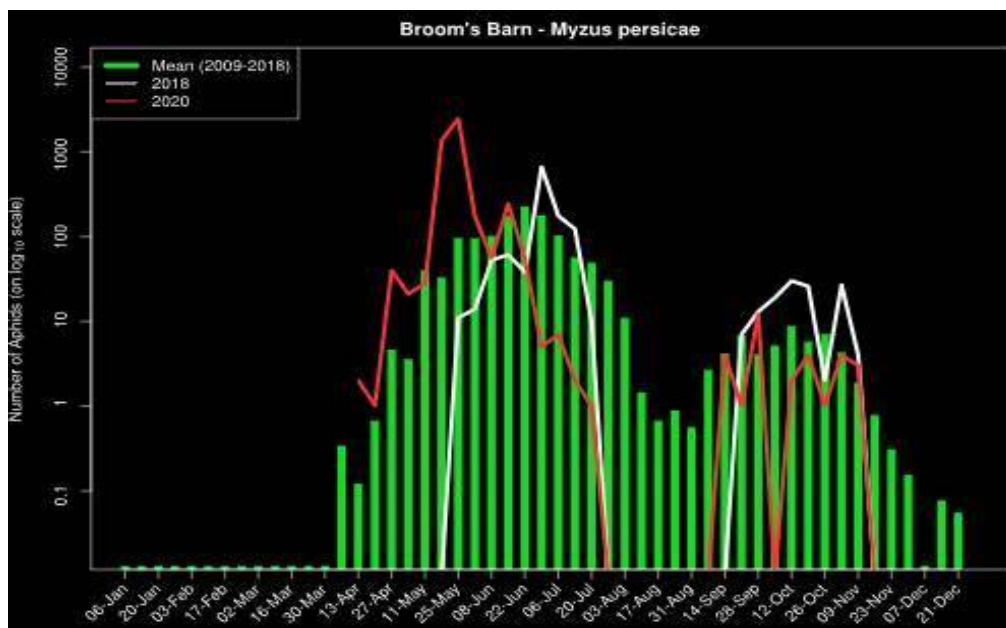


Figure 3 (left): Abundance of *Myzus persicae* in 2020 compared to previous records.

In 2020, the model predicted correctly that the first aphid flights would be in late March. Figure 4 shows just how early these aphids were in 2020 (red line), peaking in mid-May, compared to the long-term average (green bars) in mid-June. With temperatures currently following a broadly similar trend to 2018 (if not even colder), the peak of aphid numbers is likely to be similar to those seen in 2018, at the **end of June/early July** compared to **mid-May** in 2020. The aphid numbers at their peak in 2018 were also approximately 5x lower than 2020.

To date, BBRO and agronomists have recorded exceptionally low aphid numbers on monitored sites in January and early February 2021 (these samples were taken before the latest cold spell too).

Figure 4 (below): *Myzus persicae* numbers in the suction trap at Brooms barn in 2020.



Therefore, we anticipate that aphid numbers migrating into the 2021 crop will be significantly reduced and will arrive much later compared to 2020. Crops drilled in the second half of March/early April are likely to be at a more mature growth stage, compared to the young, highly susceptible stage they were at in 2020.

If the Cruiser SB derogation is not triggered, this advanced growth stage, plus the use of foliar insecticides, where required, will be key to helping to control virus transmission. Bear in mind that on any later drilled land, crops will be younger and more susceptible by the time of the later 2021 migration so will need careful monitoring and management for aphids.

There is existing approval for one foliar spray (Teppeki) and applications for Emergency Authorisations for two more foliar products have been submitted. These applications are currently being processed and we will advise you on these as soon as we can. This should be well ahead of any application dates. The supply of these products has been planned.

If the Cruiser SB derogation is triggered, seed treatment at the 45g/100,000 seeds rate has been shown to maintain protection at 10 weeks from drilling. Depending on the weather and timing of the aphid migration, you will need to start checking crops for aphids before this period has elapsed. This will be important with an anticipated later aphid migration, with aphids arriving towards the end of the afforded protection period by the seed treatment. Therefore, timely use of foliar aphicides may be needed where aphid thresholds are exceeded in crops.

BBRO aphid monitoring and mapping services will provide an early warning of aphid numbers.

Below is a reminder of the following crop rules which must be adhered to if Cruiser SB is used on seed.

	Non-restricted	Restricted	Extended Restriction
Rules	No restrictions following Sugar Beet	A minimum of 22 months from drilling of Sugar Beet	A minimum of 32 months from drilling of Sugar Beet
Crops	All cereals including Wheat, Barley, Maize, Oats, Rye, Triticale, Millet Cereal-only cover crops	All other crops excluding Oilseed Rape  Cover crops excluding Oilseed Rape	Oilseed Rape

The conditions of the derogation also state that sugar beet growers are required to minimise weeds in the area the crop is growing. For many, this will involve deploying standard herbicide programmes, but particular attention may be needed to control bolters and potato volunteers. **This condition does not include areas outside of the crop such as field margins.**

BBRO will be providing comprehensive information of weed and weed beet control during the season.



## EVENTS

Book now for BeetTech21, our virtual winter conference for updates on Virus Yellows, weed control, seed bed preparation and drilling in current soil conditions and cercospora control. The event will commence with the release of 4 short videos on Monday 8<sup>th</sup> March and culminate in a live discussion on Thursday 11<sup>th</sup> March – please book to ensure you don't miss out.

<https://bbro.co.uk/events/>



## CONTACTS

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## BASIS POINTS

Two BASIS points in total (not per bulletin) have been allocated for the period between 01/06/20 and 31/05/21 reference **CP/100686/2021/g**. To claim these points please email [michele@basis-reg.co.uk](mailto:michele@basis-reg.co.uk)

Two NRoSO points in total (not per bulletin) have been allocated between 01/06/2020 and 31/05/2021 reference **NO468433f**. To claim these points please email [NRoSOC PD@cityandguilds.com](mailto:NRoSOC PD@cityandguilds.com)