Aphid and Virus Yellows control

BBRO's Virus Yellows Tactics22

1

WITHOUT FAIL YOU MUST:

Remove or destroy any beet growth on clamps or in spoil heaps. Remove any energy/fodder beet in the vicinity of drilled crops and destroy any cover crops well ahead of drilling.

2

ADDITIONAL THINGS YOU CAN DO TO PROTECT YOUR CROP:

Encourage beneficials to your farm. Consider using under-sown barley (see page 72) especially where an early aphid migration is expected.

3

DO THE BASICS BRILLIANTLY:

Good seed bed preparation and appropriate seed rates to give optimal plant population of 100,000 plants/ha. Drill as soon as conditions are right, focusing on drill accuracy. Ensure adequate nutrition for rapid growth, carefully targeting weed control whilst avoiding herbicide damage.

4

CHECK YOUR CROP FOR APHIDS AT AN EARLY STAGE:

Keep up to date with latest info on aphids from BBRO. The cold winter, will reduce both the number of aphids and delay their migration which will reduce the impact of Virus Yellows considerably. The derogation for the use of Cruiser SB may not be triggered, so it is vital that you check your crops regularly from emergence onwards.

5

CHECK – DOES YOUR CROP NEED A FOLIAR INSECTICIDE?

Check your crops daily to assess whether the threshold of 1 green wingless aphid per 4 plants triggers the need for a foliar insecticide. Don't delay in applying where required.

Virus Yellows is a complex of 3 viruses; Beet mild yellowing virus (BMYV) and Beet chlorosis virus (BChV) which are closely related, with the third virus being Beet yellows (BYV). These viruses are transmitted when the aphid feeds, with the peach potato aphid *(Myzus persicae)* being the main concern.

Infected crops will show yellow patches in the field. However, the symptoms of yellowing can be confused with many other symptoms such as drought and nutritional deficiencies.

Reduce all potential sources of aphids and virus

- Ensure there is no beet, especially AD beet left growing in the vicinity of your crop. Check and control any leaf growth on piles of fodder beet.
- Ensure all pre-season cover crops are destroyed at least 5 weeks ahead of drilling beet.
- A difficult harvesting campaign can result in beet being left in the ground. Check for and destroy any growth on beet ground keepers in field. Check spoil heaps and destroy any leaf growth here also. Remember these will act as sources of foliar diseases such as cercospora too.
- Monitor other potential host crops on the farm to assess the risk of potential sources of virus. Some weeds can host both the virus and the aphids. Check the BBRO website for more information on virus host crops and weeds.

Good beet crop establishment

Aphids prefer and are more effective vectors of virus in young immature beet plants. Gappy crops are more attractive to aphids. Uniform crops with high plant populations (>80,000/ha) tend to lose less yield due to virus compared to crops with poor plant populations. Select your seed rate to match conditions. Aim to produce the best possible seed bed for good moisture retention and plant establishment.

Don't miss the opportunity to sow the crop early when conditions are good but ensure you choose a low bolting variety if drilling before mid-March. Avoid dry cloddy/cobbly seed beds. Use the weather forecast to decide whether it is worth waiting for conditions to improve before you establish your seed bed. Be patient, remember crops in good seed beds develop more quickly and often overtake crops that were drilled earlier into poor soil structure.

Rapid canopy development is key. Remember, from the 12-leaf stage onwards (circa 40% crop cover) the crop starts to become more resistant to virus transmission.

Ensure sufficient nitrogen and phosphorus are available to plants from early emergence. Placed N & P have been shown to improve early canopy development. Don't delay in applying foliar manganese and magnesium to young plants and if dry, consider applying boron and sulphur as well.

Select your herbicides carefully, especially in relation to weather conditions to avoid damaging the growth of the crop.

Monitor your crop

Check the BBROplus website for aphid warnings in your area. We will be providing regular aphid reports from the yellow water pan network and from a team of people scouting the crops for aphids and the level of beneficial insects.

However, as beet crops emerge, it is **essential** that you monitor your own crop regularly for aphids. Don't rely solely on the more general information or on what has been reported in other areas.

Aphid distribution can be very variable, within fields, between adjacent fields and certainly in fields at different locations across the farm.

Check open and more exposed areas of fields as well as near field margins and headlands.

Check for aphids:

1. on heart leaves (especially in windy and cool conditions)
2. within the folds at leaf margins
3. on the underside of leaves

The threshold for applying an aphicide is based on the number of green wingless aphids in your crop. BBRO recommend counting aphids on 12 plantsin 5 different locations across the field. If the threshold of 1 green wingless aphid per 4 plants up to the 12-leaf stage is reached, then treatment is justified.

If triggered the Cruiser SB seed treatment will be applied at the rate of 45g/100,000 seeds, this has been shown to maintain protection for up to 10 weeks from drilling, depending on the size of aphid migration. Start checking crops before this period has elapsed.

Apply a foliar insecticide, only if needed

- Count the number of green wingless aphids per plant; at least 12 plants in 5 locations across the field.
- Use the threshold trigger for spraying of **1 green wingless aphid per 4 plants** (3 green wingless aphids per 12 plants) up to the 12-leaf stage. If the crop has more than 12 leaves, use the threshold trigger for spraying of one green wingless aphid per plant.
- Spray if threshold reached in any area of the field.
- Products available for forthcoming season will be notified in the Advisory Bulletin
- Others to be confirmed subject to EA or other approval.

Know your aphids

Myzus persicae

These aphids are vectors of the yellowing viruses. You do not need to identify aphid species to determine if your crop is at threshold, just look for green wingless aphids.

Host species

Myzus persicae has a large range of host plants. These include: brassicas, potatoes, legumes, lettuce and sugar beet. Further virus hosts listed below:

Beet yellowing virus (BYV)	*Beet mild yellowing virus (BMYV)*
Common chickweed *(Stellaria media)*	Scarlet pimpernel *(Anagallis arvensis)*
Common orache *(Atriplex patula)*	Shepherd's purse *(Capsella bursa-pastoris)*
Common poppy *(Papaver rhoeas)*	Corn marigold *(Chrysanthemum segetum)*
Common purslane *(Portulaca oleracea)*	Red dead-nettle *(Laminum purpureum)*
Corn spurry *(Spergula arvensis)*	Common poppy *(Papaver rhoeas)*
Garden orache *(Atriplex hortensis)*	Groundsel *(Senecio vulgaris)*
Red dead-nettle *(Laminum purpureum)*	Corn spurry *(Spergula arvensis)*
	Common chickweed *(Stellaria media)*
	Field pansy *(Viola arvensis)*

Encourage natural aphid predators (beneficial insects)

Hedgrow and field margins have been shown to support beneficials that contribute to reducing aphid numbers. Numbers of beneficials increase when prey numbers are high, so control tends to lag behind. Increasing beneficials in the field margins will give them a 'head start'. When the aphid migration is very early as in 2020 and beneficial numbers low, virus transmission will be exacerbated.

Consider establishing field margins or drill strips with plant species which encourage beneficial insects such as ladybirds, ground beetles, lacewings, hover flies and parasitic wasps. Early establishment of field margins will help to build beneficial numbers earlier in the season.

Use a mix of grasses and wild flowers in field margins to provide ground cover and sources of food for beneficials. Information on plant species that encourage beneficials can be found on the BBRO website.

There is limited data on the tactic of releasing beneficials into crops to predate on aphids. The number of predators and the timing of release is critical, especially if aimed at reducing early virus transmission. It is likely to be an expensive option to establish sufficient numbers of predators. BBRO are currently evaluating this as an option for IPM.

Avoid using pyrethroid foliar insecticides during the season. Aphids are widely resistant to these and BBRO work has shown that the use of these reduce the number of beneficials, therefore increasing the aphid numbers.

The best course of action it to check your crops regularly.

Threshold for treatment:
1 green wingless aphid per 4 plants up until 12 leaf stage. Between 12-16 leaves the threshold is 1 green wingless aphid per plant.

DON'T BE TEMPTED BY PYRETHROIDS!

OVER 80% OF PEACH POTATO APHIDS (*MYZUS PERSICAE*) ARE RESISTANT TO PYRETHROIDS

Use of an under-sown barley cover crop

There are some limited data that shows having an under-sown barley cover crop can reduce virus symptoms when there is an early aphid migration. This is thought to be associated with reducing the ability of the aphids to identify young beet crops, thus diverting them away.

This tactic is considered to be most effective when aphids arrive early in crops with small canopies and may be less effective when aphids migrate into the crop later in the season with more established canopies.

Aim to drill barley at a seed rate of 50-60kg/ha, 5-7 days before drilling beet. If using the barley to also stabilise windblow you will clearly need to drill the barley earlier.

Ensure the beet canopy is well established, ideally beyond the 4-6 leaf stage, before destroying the barley. The decision will need to be based on how vigorous the cover crop is and the forecasted weather conditions, to assess how quickly the cover will be killed. We have measured reduction in beet yields where the cover crop has been destroyed too late, allowing it to compete with the beet crop.

Use of graminicides as opposed to more general herbicides with adjuvants will reduce the risk of herbicide damage to the beet. Remember to allow some time for the herbicide to work fully.

Use of Conviso® SMART beet varieties may be an option but don't compromise herbicide timings for the control of other weeds.

Virus yellows

When: June onwards

Symptoms: Thick, brittle yellow leaves

Risk: Mild, dry conditions which favour the aphid vectors

Severity: Previous trials show yield losses of up to 30% with BMYV and up to 47% with BYV

Advice: Currently, one application of Teppeki (flonicamid) is authorised for the control of virus-carrying aphids. The BBRO does not recommend the use of pyrethroid and carbamate insecticides on virus-carrying aphids as 80% of peach-potato aphids are resistant