

Bemisia tabaci – the tobacco whitefly (also known as the silverleaf or sweet potato whitefly)

What is it?

Bemisia tabaci is a worldwide pest and virus vector. Originally known as a pest of sub-tropical crops, the species is now widely distributed under glass in temperate areas including most of Europe. It is not established in the UK but it could establish in protected environments, where it has the potential to be a major pest, particularly of glasshouse salad crops such as tomato and cucumber.

Why the concern?

B. tabaci is a major vector of more than 110 virus species. In the UK, the risk of virus transmission presents a serious threat to protected crops, particularly vegetables. Tomato yellow leaf curl virus (TYLCV) and Cucurbit yellow stunting disorder virus (CYSDV) are of particular concern. Symptoms of TYLCV include small abnormally developed leaves and flower drop. If tomato plants are infested at an early stage, the disease may lead to total yield loss due to failure of fruit formation. TYLCV is the main limiting factor on tomato production in certain areas of the world including parts of Spain, Portugal, Israel and Tanzania. In addition to virus transmission, *B. tabaci* causes direct damage by its' feeding activity and indirect damage can be caused by the sooty moulds that develop on honeydew excreted on the host plants.



Tomato crop infected with Tomato yellow leaf curl virus (TYLCV) transmitted by *B. tabaci*





Curcurbit yellow stunting disorder virus (CYSDV) CYSDV causes mosaic and mottling in cucumbers damage to a cucumber crop in Spain

What are the hosts and how does it spread?

B. tabaci is a pest of an extremely wide range of host plants, and the number of recorded hosts is increasing. They include crops grown outside in the tropics and sub-tropics (including cotton, soyabean and cassava), vegetable and salad crops grown under glass in Europe (e.g. cucumber, aubergine, peppers and tomatoes) and ornamental plants (e.g. poinsettia).

There are a number of biotypes of *B. tabaci* and it is the B and Q biotypes that present the most risk to the UK. The B biotype, or poinsettia strain, is of major concern as it develops faster than other biotypes, producing greater numbers of off-spring. It also produces larger amounts of honeydew, has a broader host plant range, is more insecticide resistant and induces several different phytotoxic disorders in certain plant hosts (e.g. squash silverleaf disorder which affects tomatoes and cucurbits). It has been spread in trade, greatly expanding its range to include European glasshouses. The Q biotype is thought to have originated from the Mediterranean region and has been associated with whitefly control problems. It is known to have resistance to pyriproxyfen, buprofezin and reduced susceptibility to the neonicotinoid insecticides imidacloprid, acetamiprid and thiamethoxam.

How does the pest arrive in the UK?

The first outbreak of *B. tabaci* in the UK was in 1987 on poinsettia cuttings and poinsettia have continued to be the major source of interceptions and outbreaks of the pest. However, the worldwide spread of this pest and its ability to survive on numerous hosts have led to interceptions on a diversity of plants from a range of source countries. Some of the other hosts on which *B. tabaci* has been intercepted are plants for planting including *Ajuga*, *Ficus* and *Hibiscus*, cut flowers especially *Solidago*, herbs such as thyme and rosemary and on the foliage of vegetables such as sweet potatoes. The pest has been found on material coming from other European countries, North and South America, Asia and Africa.



Poinsettia showing chlorosis of new foliage caused by heavy feeding by immature *B. tabaci*

Photo courtesy of the University of Florida

What does it look like?

B. tabaci adults are about 1mm long and similar to the glasshouse whitefly (*Trialeurodes vaporariorum*). The two species are difficult to distinguish in the field, but differ slightly:

The wings of *B. tabaci* are held tent-like above the body and slightly apart, so that the yellow-tinged body is more apparent.

Adult females tend to lay eggs randomly, either singly or in scattered groups, usually on the under-surface of leaves, whereas the glasshouse whitefly usually lays its eggs in a semi-circle. However, on smoother leaved plants, such as *Ficus*, *B. tabaci* generally lays eggs in semi-circles.

There are four immature stages (larvae) of *B. tabaci*, of which only the first is mobile. Their appearance differs slightly, depending on the host plant, but the 'pupae' or fourth larval stage are generally more yellow and pointed at the rear end than those of the glasshouse whitefly.

In comparison with the glasshouse whitefly, *B. tabaci* pupae appear flatter, and do not have a marginal 'fringe' of wax filaments or long waxy rods on the dorsum.

Adult *B. tabaci*



B. tabaci eggs



Adult *T. vaporariorum*
(glasshouse whitefly)



B. tabaci pupa (fourth larval stage)



T. vaporariorum pupa

Best Practice – How can nursery outbreaks be avoided?

- Seek assurance from commercial suppliers that plants are free from this pest as part of your commercial contract.
- Thoroughly inspect all new plant material for all stages of the pest when it first arrives at the nursery, particularly on the lower leaves where immature stages are likely to be most visible.
- Keep recently received plants isolated to monitor closely and prevent the spread of any potential infestation.
- Monitor crops throughout the growing season with yellow sticky traps. Check for the presence of whiteflies by agitating plants to encourage flight by adults and inspect the leaves for immature “scales”.
- Never mix ornamental and vegetable crops in the same cropping area. A *B. tabaci* outbreak in such a situation would be difficult to control due to the limited number of insecticides registered for use on glasshouse edibles and the risk of virus spread.
- In high risk crops such as poinsettias, preventative release of biological control agents or an application of a systemic insecticide is recommended as soon as plants are brought on to the nursery.
- If any life stages of the pest are detected, begin whitefly treatment programmes immediately to ensure prompt eradication.
- At the end of the season, dispose of remaining plants and thoroughly clean and sterilise the glasshouse area. A complete crop break will help ensure complete eradication of the pest and prevent carry-over into subsequent crops.

Keep a good look out

If you do suspect the presence of this pest you should immediately inform your local Defra Plant Health and Seeds Inspector (PHSI) or:

PHSI HQ, York

Tel: 01904 455174

Fax: 01904 455197

Email: planthealth.info@defra.gsi.gov.uk

web: www.defra.gov.uk/planth/ph.htm