



Department
for Environment
Food & Rural Affairs

Plant Pest Factsheet

Brown Marmorated Stink Bug

Halyomorpha halys



Figure 1. Adult brown marmorated stink bug © D. Lance, USDA, APHIS, PPQ

Background

The brown marmorated stink bug *Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae), native to East Asia, is an invasive species that is expanding its range in North America (first detected in 1996) and in Europe (first detected 2004). It is highly polyphagous, damaging numerous crops. It has been intercepted in the UK on four occasions: associated with passenger luggage flown in from the USA; with stone imported from China; with sawn wood from North America; and with clothing from the USA.

Geographical Distribution

Halyomorpha halys is native to Asia.

Europe: France (2012), Germany (2001), Greece (2011), Hungary (2013), Italy (2012), Lichtenstein (2004) and Switzerland (2004).

Asia: China, Japan, Korean Republic and Taiwan.

North America: USA.



Figure 2. Brown marmorated stink bug eggs © D. Lance, USDA, APHIS, PPQ



Figure 3. Brown marmorated stink bug hatched eggs and first-instar nymphs © D. Lance, USDA, APHIS, PPQ



Figure 4. Brown marmorated stink bug third instar nymphs © D. Lance, USDA, APHIS, PPQ



Figure 5. Group of Brown marmorated stink bug fourth and fifth instar nymphs © G. Bernon, USDA, APHIS



Figure 6. Brown marmorated stink bug adult © S. Ellis



Figure 7. Brown marmorated stink bug adult on a peach © G. Bernon, USDA, APHIS

Host Plants

Halyomorpha halys is a highly polyphagous pest attacking more than 100 plant species, primarily fruit trees and woody ornamentals, but also field crops. Fruit crops: *Citrus* spp., *Diospyros* spp., *Malus domestica* (apple), *Morus* spp. (mulberries), *Prunus armeniaca* (apricot), *P. avium* (sweet cherry), *P. domestica* (plum), *P. persica* (peach), *Pyrus communis* (pear), *Rubus idaeus* (raspberry) and *Vitis vinifera* (grapevine). Field crops: *Asparagus* spp., *Glycine max* (soybean), *Phaseolus vulgaris* (common bean) and *Zea mays* (maize). Forest and ornamental trees/shrubs: *Abelia*, *Acer* (maples), *Aralia elata*, *Buddleia davidii*, *Cryptomeria*, *Cupressus*, *Decaisnea fargesii*, *Hibiscus*, *Lonicera*, *Paulownia tomentosa*, *Rosa rugosa*, *Salix* (willows), *Stewartia pseudocamellia* and *Tropaeolum majus*. In Asia, *H. halys* has also been found on weeds (e.g. *Actrium* spp.).

Description

The eggs are elliptical (1.6 x 1.3 mm) and light green in colour. They are attached side by side in groups of 20 to 30 on the underside of leaves (Figure 2). There are five nymphal instars. They range in size from 2.4 mm at the first instar to 12 mm in length at the last instar. Deep-red eyes characterize the immature stages. The abdomen is a yellowish-red in the first instar (Figure 3) and gradually turns to off-white with reddish spots in the latter instars (Figs 4-5). The pronotum of the nymphs is armoured with spines, and the tibiae of third to fifth-nymphal instars show a white band. Adults are approximately 17 mm long and are generally brown in colour (Figs 1 and 6). Distinguishing characteristics found on adult *H. halys* include lighter bands on the antennae and darker bands on the membranous, overlapping part at the rear of the wings (Figure 1). They also have patches of coppery or bluish metallic-coloured punctures on the head and pronotum. The scent glands are located on the dorsal surface of the abdomen and the underside of the thorax. It is these glands that are responsible for producing the pungent odour that characterizes "stink bugs."

Biology

In the USA, one generation has generally been reported, however recent hot summers in Eastern USA (2010 – 2011) have resulted in more than one generation per year. In its native range 5-6 generations per year have been reported. It overwinters in the adult stage (diapause). In summer, females lay eggs (50- 400 eggs, clustered in groups of 20-30) on the underside of the leaves. *H. halys* has a high minimum threshold for development (over 14°C).

Dispersal and Detection

Halyomorpha halys is a strong flyer which can move from host to host during the growing season. Over long distances, the pest can be disseminated by trade of host plants but also by movements of goods or vehicles. The pathways of introduction of *H. halys* into the USA or Switzerland remain unknown but it is suspected that the pest was introduced either as a hitchhiker on packing material or via plant imports.

Economic Impact

Like other true bugs, *H. halys* feeds by sucking plant juices. Adults generally feed on fruit, whereas the nymphs feed on leaves, stems and fruit. The most important crop damage results from insect feeding on pome and stone fruits, and on seeds inside legume pods (e.g. beans and soybean). Leaf feeding is characterized by small lesions (3 mm diameter) which may then become necrotic and coalesce. Fruit that has been fed on by *H. halys* may

have small necrotic spots or blotches, grooves and brownish discolorations. In cases of heavy infestations, fruit are severely disfigured and rendered unmarketable. In Asia, *H. halys* causes significant damage to soybean and various horticultural crops. In Northern Japan, apple crops have increasingly been damaged by *H. halys*. Forest trees are known hosts of *H. halys*, but no damage has been reported in Asian forests. However, in Japan *H. halys* is considered as a pest in nurseries producing seeds of cedar and cypress because it can feed on cones. In the USA, damage caused by *H. halys* was initially reported in suburban or urban environments on woody ornamentals and peach and pear trees. However in 2006, commercial fruit growers reported damage in apple and pear orchards. *Halyomorpha halys* is considered a vector of Paulownia witches' broom phytoplasma in Asia.

In addition to plant damage, *H. halys* can be a nuisance to humans because at the end of autumn, adults can aggregate in buildings and houses (on walls, window and door frames) seeking overwintering sites. When disturbed or crushed they discharge a characteristic pungent odour (unpleasant and long lasting!). In the USA, many homeowners are complaining about this nuisance. There have also been reports of the adult bugs entering buildings in Switzerland and of causing a nuisance to residents in Athens, Greece.

The potential economic impact that *H. halys* may have on the agricultural and horticultural industries, particularly on pome and stone fruit trees, in the UK is unclear. Although conditions are suitable for establishment, *H. halys* is not likely to cause significant impacts to UK crops since low summer temperatures will limit this species to one generation per year. Reports from the USA suggest that more than one generation per year is required before serious economic damage is observed. Climate data suggests that *H. halys* would not be capable of more than one generation per year, except in southern Europe, and it has not been reported damaging crops in Switzerland. Nevertheless, changes in the distribution and reproduction of this species need to be monitored because it may adapt to its new environment and climate change will also play a role. There is the potential for *H. halys* to become a nuisance pest in the UK as it has done in Greece and the USA.

Advisory Information

The biggest impact of *H. halys* in the USA has been as a nuisance pest when it congregates in domestic buildings. Filling the cracks around doors and windows with a silicone-based or similar sealant can help to prevent such invasions. Once *H. halys* have entered homes, removing the bugs with vacuum cleaners is recommended in the USA.

Pest management strategies for *H. halys* are still being researched in the USA, and there are a number of promising leads involving egg parasitoids and aggregation pheromones, but there are, as yet, no effective biological control agents available specifically for this pest in the UK. However, pyrethroid insecticides (such as deltamethrin and lambda-cyhalothrin) have been shown to be effective treatments. Pyrethroids have the drawback that they are likely to have an impact on non-target arthropods including predatory species. Products containing deltamethrin are currently approved for use by professional growers for use on apple and pear crops. Products containing lambda-cyhalothrin are currently approved on label for pear crops and have off-label approvals for apple crops. There are currently also insecticides registered for home and garden use containing lambda-cyhalothrin or deltamethrin. Pesticide approvals are constantly changing therefore the approval status of products should be checked before use. Approvals can be checked using the Chemical Regulation Directorate's internet search page (<https://secure.pesticides.gov.uk/pestreg/ProdSearch.asp>). All users of plant protection products should read and follow the instructions on the product label (and off-label approval notices when appropriate).

Although not a notifiable pest, reports of suspected outbreaks of brown marmorated stink bug would be appreciated by the relevant authority, to help monitor findings:

For **England and Wales**, contact your local **APHA Plant Health and Seeds Inspector** or the **PHSI Headquarters**, Sand Hutton, York. Tel: 01904 405138

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

For **Scotland**, contact the **Scottish Government's Horticulture and Marketing Unit**:

Email: hort.marketing@gov.scot

For **Northern Ireland**, contact the **DARD Plant Health Inspection Branch**:

Tel: 0300 200 7847 Email: planthealth@dardni.gov.uk

For additional information on UK Plant Health please see:

<https://secure.fera.defra.gov.uk/phiw/riskRegister/>

<https://www.gov.uk/plant-health-controls>

<https://www.dardni.gov.uk/>

Authors

C. Malumphy (Fera) and D. Eyre (Defra)

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