

# Brown Marmorated Stink Bug

## *Halyomorpha halys*



BMSB is rapidly emerging as one of the most significant biosecurity threats to the New Zealand kiwifruit industry, as pressures at our borders increase. The risk of this pest entering New Zealand is now considered extreme and if it were to arrive eradication would be a significant challenge with a low likelihood of success and kiwifruit growers could expect fruit loss of around 30% on affected orchards, from feeding damage and subsequent storage rot.



Figure 1. Adult BMSB with ruler to indicate large size (top), nymph and egg mass (bottom).

BMSB can hitchhike on inanimate objects such as cars and shipping containers from Asia, the USA and Europe. If it were to enter New Zealand it would have no problem establishing due to our highly suitable climate and abundance of host material. Its entry and establishment would result in significant production impacts to many horticultural industries.

## Identification

**Every kiwifruit grower should know what BMSB looks like, and ensure their friends do too; early detection is our best line of defense.**

BMSB is most easily recognised by its large size, 14-17mm which is roughly the same size as a \$1 coin and larger than other shield bugs found in New Zealand.

BMSB has a shield-shaped body that is mottled brown with white banding on the antennae and alternating light/dark bands on the outer edge of the abdomen.

Nymphs look different to the adults and are brightly coloured with black and white banding on legs, dark reddish eyes and a yellow-reddish underbelly with black stripes (Figures 1 and 4).

Eggs are white or pale green and cylindrical shaped, laid on the undersides of leaves in clusters of about 25. The eggs are only 1mm in diameter but become apparent when nymphs emerge as they stay with the egg mass for several days.

## Signs and symptoms

BMSB have a very wide host range of over 200 plants, including kiwifruit. BMSB adults and nymphs suck on the sap of leaders, young leaves, shoots and fruit. Injured fruit typically has black spots or blue scars on the skin, flower or fruit drop and deformed fruit. The injured parts of fruit usually turn white and “spongy” and eventually rots (Figure 2).

Reports from kiwifruit growers in Italy, China and Korea indicate fruit loss on affected orchards can be 30% or more.

Adults are mobile and readily move from plants with early ripening fruit to ones with later ripening fruit. They seek shelter in houses/protected areas in autumn/winter. Egg masses and nymphs may be seen on the undersides of leaves.



Figure 2. BMSB feeding damage to Hayward kiwifruit from a laboratory trial (UCR, CA)

## Distribution and climate range

BMSB is now present across three major continents (Figure 3). It is native to Asia and found in China, Japan and Korea. In 1996, it invaded the USA where it rapidly spread across 42 states. In 2007, it was detected in Switzerland and has now spread to 14 countries in Europe and is increasing in numbers and spreading to rural areas including Italian kiwifruit orchards.

BMSB has recently established in Santiago, Chile, the first population in the Southern Hemisphere. This potentially increases the risk to New Zealand given our seasonal alignment.

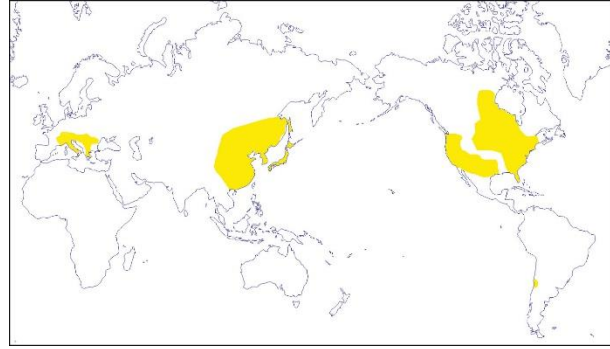


Figure 3. Distribution of BMSB (in yellow)

## Control

Eradication of BMSB is extremely difficult and early detection is crucial for success. While traps are available for monitoring, these are not suitable for use in a surveillance network for early detection like we have for fruit flies. Public reporting of suspect finds is critical. KVH has produced fridge magnets for all growers and community members - please ensure you and the people around you are aware of this threat and contact us if you would like more magnets or other material.

Insecticides may be an important tool in an eradication attempt, but are unsuitable for long term management given the residue issues that would be associated with repeat applications at high dosage rates.

Therefore, if BMSB were to establish in New Zealand, kiwifruit growers would likely manage impacts through a programme of more sustainable control tools such as exclusion with netting, use of trap crops, traps, and 'softer' chemicals. The most promising tool is the parasitoid wasp *Trissolcus japonicus*, aka. the Samurai wasp, which is capable of parasitizing over 80% of BMSB egg populations. KVH is part of a steering group, with the Ministry for Primary Industries (MPI) and other horticultural sectors, currently seeking Environmental Protection Agency (EPA) approval to release this biocontrol agent should BMSB establish here.

Significant research efforts are being put into developing new tools and technology to detect, control and reduce the impacts of BMSB:

- internationally; such as STOPBMSB in the USA (50 researchers across 18 organisations);
- nationally; approach in New Zealand involving MPI, B3 and industry organisations;
- kiwifruit specific readiness programme, led by KVH/Zespri to overcome knowledge gaps specific to our sector that are not being addressed elsewhere.



Figure 4. Nymphal stages of BMSB. 2nd to 5th instar, adult male and adult female. Photo W. Hershberger

## What should you do if you think you have seen this pest?

Phone: MPI on 0800 80 99 66 or KVH on 0800 665 825

### How to distinguish BMSB from other New Zealand shield bugs



Brown shield bug (*Dictyotus caenosus*)

Approx. 10mm long

**Present in New Zealand**



Pittosporum shield bug (*Monteithiella humeralis*)

Approx. 9.6mm long

**Present in New Zealand**



Brown soldier bug (*Cermatulus nasalis*)

Approx. 15mm long

**Present in New Zealand**



Brown form of green vegetable bug (*Nezara viridula*)

Approx. 17mm long

**Present in New Zealand**

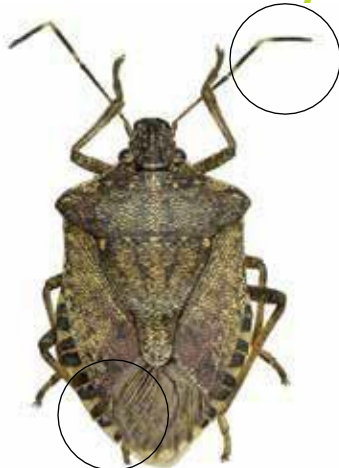


Brown Marmorated Stink Bug (*Halyomorpha halys*)

Approx. 17mm long

**Not present in New Zealand**

### How to identify BMSB



There are currently other species of stink bugs found in New Zealand that could be confused with the BMSB. Key distinguishing features of the adult BMSB are:

its size (14 - 17mm long)

- white banding on the antennae
- alternate black and white markings on the abdomen.