



Samurai wasp EPA application – Q&A

What is the aim of the application?

The application will seek approval to import and release the samurai wasp (a parasitoid) in the event of an incursion of brown marmorated stink bug (BMSB, *Halyomorpha halys*) being detected in New Zealand. The application has been submitted by the BMSB Council (established under the Government Industry Agreement for Biosecurity Readiness and Response) to pro-actively prepare New Zealand for a significant social, economic and potentially environmental pest.

Why is BMSB such a threat?

BMSB is one of the highest risk biosecurity threats currently facing New Zealand and is frequently intercepted at the border. BMSB threatens an extensive range of New Zealand's commercial crop and amenity plant species, and establishment here would likely result in significant social and economic impacts, with the potential for detrimental environmental impacts. BMSB feeds on over 300 plant species, many of which are important horticultural crops, and it is expected that it may feed on New Zealand native plant species. It can reproduce and get to very high population numbers rapidly, destroying crops and gardens and getting into homes to cause significant social nuisance impacts.

Why samurai wasp?

The wasp is a natural enemy of BMSB and would be an important tool against BMSB if the pest were to arrive in New Zealand. Other control options are very limited, with use of broad-spectrum chemicals being one of the only tools currently available. Parasitoids can use cues to locate and target BMSB egg masses and would maximise the chance of controlling any outlier BMSB during a biosecurity response. In a longer-term situation (ie if BMSB cannot be eradicated and becomes established), the parasitoid would likely become a key tool in keeping BMSB population levels down and would provide growers with an alternative to increasing use of sprays.

Does the wasp sting?

The samurai wasp is not like the large exotic German or common wasps found in New Zealand. The samurai wasp is tiny (about the size of a pin head) and does not sting people.

What are the expected outcomes of a release?

It is expected that once released, the samurai wasp will establish a self-sustaining population on BMSB, keeping population numbers down, but not exhibiting total control. It is one of a range of tools that would be used to manage BMSB and would likely help to reduce the amount of insecticide needed to control the pest. If the wasp was to establish permanently in New Zealand there would be no feasible way to eradicate it.

What native insects might be harmed by the samurai wasp?

Overseas field and laboratory information shows that the samurai wasp only attacks insects in two insect families: Pentatomidae (stink bugs and shield bugs) and Scutelleridae (jewel bugs or shield-backed bugs). No species from the Scutelleridae family exist in New Zealand. Only eight species (and two sub-species) from the family Pentatomidae are present in New Zealand. Four of the eight New Zealand pentatomids are considered exotic, three are considered native (all are also present in Australia) and one species is considered endemic (as are the two sub-species).

Host testing has shown that under laboratory conditions, with no other hosts to choose from, the wasp will parasitise the eggs of New Zealand pentatomids. However, overseas experience shows that samurai wasp has a preference for BMSB over other hosts and tend to parasitise BMSB eggs over the eggs of other species given the choice.



Samurai wasp laying eggs inside BMSB egg mass

One species, the black alpine shield bug (*Hypsithocus hudsonae*), and one sub-species (*Cermatulus nasalis turbotti*) have not been tested. This is due to their distribution in remote locations making them difficult to collect (alpine mountain ranges in the South Island and the Three King's Islands off Cape Reinga respectively).

Although these species may turn out to be hosts, it is expected that the remote locations and possible differences in habitat preference, such as vegetation type, will mean their exposure to samurai wasp will be very limited, if any at all.

Economic cost:benefit analysis

The New Zealand Institute of Economic Research (NZIER) was contracted to provide an economic assessment of the options for managing BMSB. This report compared no management with three options for managing BMSB:

- Do minimum (some minor additional spraying is used to reduce yield losses).
- Precautionary chemical treatment (more intensive application of chemicals).
- Introduction of a biological control agent (ie samurai wasp).

The cost benefit analysis covered a period of 20 years. The report shows that while the biocontrol option is the most costly, it has the greatest net benefit (in terms of crop losses). Generally, the long-term costs for a classical biocontrol programme taper off very quickly after initial establishment of the biocontrol.

Social, environmental and cultural considerations

The cost benefit analysis did not attempt to quantify the social or environmental costs and benefits (for example infestation of domestic gardens and structures). These are considered in the table below. The risks posed by BMSB to natural habitats, taonga species and the environment in New Zealand are currently unknown but are considered likely to be far more significant than the risks posed by the biological control agent. The social cost from BMSB is known to be significant in countries where there are no effective natural enemies of BMSB.

Overseas considerable infestations have been recorded inside homes during winter with thousands of bugs invading people's living spaces – these are collected up daily. Therefore, the societal benefit from biocontrol adds further to the quantified benefit, with little, if any, additional cost.

Non-economic benefits and trade-offs of biological control for long term management of BMSB

Benefits	Trade-offs
<ul style="list-style-type: none">• Targeted and self-sustaining control of BMSB• Reduced use of chemical spray• Reduced disruption of integrated pest management systems• Produce quality maintained• Increased ability to maintain low insecticide residue limits for consumer, and foreign market acceptance• Increased protection of non-commercial host plants such as taonga species, native species, home gardens and amenity plantings that may be negatively impacted by BMSB• Support for export and regional development objectives• Increased protection from social nuisance Impacts.	<ul style="list-style-type: none">• Potentially high initial cost• Potential for incidental impact on non- target pentatomids.

How can I have my say?

If you'd like to lodge a submission (whether in support or opposition of the application), you can provide a submission via the EPA. Visit their website: www.epa.govt.nz

As you are completing your submission, you may wish to consider:

1. The potential impact of BMSB on:
 - your livelihood (ie your business/industry)
 - your lifestyle
 - your cultural, social and environmental values.

2. The samurai wasp as a control tool in comparison to the other available tools (overseas other options primarily include insecticide, trapping, exclusion netting).

3. Whether you support or oppose the release of samurai wasp in the event of a BMSB incursion being detected in New Zealand.