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Plant Health Australia's submission on the Inspector-General of Biosecurity Review of the effectiveness of biosecurity measures to manage the risks of brown marmorated stink bug (BMSB) entering Australia, and what if any improvements should be made.

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Plant Health AUSTRALIA

Improving national biosecurity
outcomes through partnerships

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Plant Health Australia (PHA) is the national coordinator of the government-industry partnership for plant biosecurity in Australia. Our members comprise all major plant industry bodies that represent Australian growers and beekeepers, plus all state and territory governments and the Australian Government.

PHA independently advocates on behalf of the national biosecurity system to benefit plant industries and the environment. Our goal is to minimise plant pest impacts on Australia, boosting industry productivity and profitability and enhancing market access.

PHA welcomes the opportunity to provide a submission on the Inspector-General of Biosecurity Review of the effectiveness of biosecurity measures to manage the risks of brown marmorated stink bug (*Halyomorpha halys*: BMSB) entering Australia, and what if any improvements should be made.

Comments on the review

Potential impacts of BMSB

The BMSB is one of the top ten high priority plant pests to Australia. Overseas experience has shown that if the bug established in Australia it would have a significant impact on horticulture, grains and cotton crops, nursery stock and ornamental plants, along with potential damage to other plants in our environment. The bug also causes significant issues for the general community as it can be found in the thousands seeking shelter in buildings and equipment and has a foul-smelling odour when crushed or disturbed.

Hosts

The BMSB is a voracious feeder that causes damage to plant tissue through its saliva. The juvenile or nymphal stages cause the most damage.

BMSB is known to feed on more than 300 hosts, including significant horticultural crops in Australia. These include apples, pears, grapes, peaches, pears, tomatoes, corn, vegetable crops such as beans, field crops such as soybeans, cotton and some grains, along with some ornamental plants.

Buildings and vegetation, including wild and ornamental plants, provide refuge for adults, which can then be a source of re-infestation for nearby crops.

The Centre for Agriculture and Biosciences International (CABI 2016) has found evidence that BMSB can cause:

- losses of up to 90% for pome and stone fruit
- damage exceeding 50% under heavy infestations of vegetable crops
- taint and contamination of harvested fruit, particularly for small fruit and grapes

An analysis for responses to recent BMSB detections in Australia recognised 15 cropping sectors being potentially impacted, whilst there is limited data to suggest that a further eight sectors could be affected.

BMSB would also be expected to impact many of our amenity plans and adapt to native flora, causing significant environmental impact.

Dispersal

The BMSB can spread rapidly. Since it arrived in the US in the late 1990s, where no restrictions were in place, it has spread to 44 states. It has proved far more damaging and difficult to control than other stink bugs as many insecticides are ineffective or require multiple sprays to provide control.

An examination of the potential risk of the pest to Australia found that there are suitable climates for the pest on the east coast and southwest Australia and in New Zealand.

Economic impact

A study on the likely economic impact of BMSB on the New Zealand economy (NZIER 2017) found that the bug would significantly reduce horticultural yields and impose surveillance and treatment costs on orchard owners. For example, it indicated a yield loss of 47 and 45% for apples and pears respectively due to BMSB uncontrolled depredation, and even with chemical control, losses of 25% were forecasted once BMSB was established in NZ.

The study estimated horticulture export values would fall by between NZ$1.4 and $3.0 billion in 2028 and between NZ$2.0 billion and $4.2 billion in 2038 as a result of presence and impact of BMSB. It said the bug's

presence would not only result in additional pesticide costs, but also reduced labour productivity, lower export prices, new machinery requirements, the cost of planting sacrificial crops to draw BMSB away from priority crops and additional netting. This cost could be reduced if a biocontrol agent for BMSB could be found, but this task is more difficult in Australia as there are a wide range of native bugs that could also be impacted.

Increasing risk of entry to Australia

The abilities of the BMSB to lie dormant and travel around the world hidden in cargo, to fly, and to feed on a wide range of plant hosts, has enabled it to make its way to new regions and spread rapidly. This has led the bug to spread from eastern Asia to North America in the late 1990s, and more recently to Europe. Thus, there are increasing opportunities for the pest to enter Australia, especially on cargo.

PHA is aware that since 2014, increasing numbers of live BMSB adults were intercepted as hitchhikers on various goods coming to Australia. From December 2014 larger numbers of live BMSB were intercepted in cargo from the USA, requiring the Department of Agriculture and Water Resources (the Department) to put urgent response measures in place during the BMSB season of 1 September to 30 April. Between 2015 and 2017 the Department applied seasonal measures to certain goods shipped from the US. In 2017–18 the Department initially extended measures to vehicles and machinery shipped from Italy, due to the detection of increasing numbers of BMSB on these goods. Measures were then extended to a wide range of containerised goods from Italy due to high rates of BMSB detected on these goods.

For the 2018–19 season the Department extended the seasonal BMSB measures for imported sea cargo to a further seven European countries, as well as subjecting vessels from Japan to heightened surveillance for BMSB. During the BMSB season the Department again revised import arrangements for shipments of specific goods arriving from certain countries to address a significant number of BMSB detections at Australia's border and post-border.

Since 1 September 2018, three ships infested with BMSB were prevented from docking in Australia. Other shipments have been required to be fumigated/treated both offshore and onshore to prevent live BMSB reaching our shores.

This season there has already been a total of seven post-border detections of BMSB occurring in Queensland, Victoria and Western Australia, an increase on the three post-border detections in the previous season. Live and dead bugs were found on a variety of imported cargo, all non-agricultural origin, such as machinery, cars and terracotta pots. The Department is working closely with each of the affected state governments under nationally agreed response arrangements.

It should also be noted that in 2017–18, two nationally cost-shared responses between agricultural industries and governments were implemented under the Emergency Plant Pest Response Deed (EPPRD). Each detection has seen swift and effective response measures put in place. This has involved assessment of the risk, fumigation, trapping and monitoring to prove freedom of the pest.

Funding emergency responses

The current partnership model for emergency plant pest responses under the EPPRD is that government and agricultural industry signatories considered the beneficiaries of the eradication decide and fund any response.

Under this arrangement if pest eradication is deemed not possible, or if an eradication program is not successful, then the pest would become established in Australia, with ongoing impacts and costs to industry, the environment and the community.

For the emergency responses to two detections of BMSB in Australia in 2017-18, 15 different cropping sectors (including many horticulture industries, the cotton and grains industries), along with the federal and state/territory governments, funded the emergency responses.

With the current risk of BMSB arriving in Australia being as of result of the management of non-agricultural imports into Australia, this raises the prospect that the potential risk creators (quarantine agencies in source countries, the companies exporting goods to Australia, treatment providers, shipping/logistics companies which pack and transport goods to Australia and importers and agents in Australia) should bear some responsibility for funding the cost of an emergency plant pest response.

RECOMMENDATIONS

1. With all incidents of BMSB being intercepted en route to Australia or detected in Australia being found on non-agricultural commodities, it is therefore most appropriate that the risk creators (listed above) bear responsibility and the cost of keeping the pest out of Australia. The risk creators should therefore be required to continue to pay for the cost of treatment of goods and vessels infested with BMSB.
2. If there are further detections or incursions of BMSB, the risk creators (listed above) should be called upon to contribute to the BMSB eradication programs; and if eradication is not possible, to contribute to the significant management costs for the bug for industry and the Australian environment.
3. With a significant number of BMSB detections at Australia's border and post-border this BMSB season, the Department should assess:
    a. the success of their communication program targeting relevant stakeholders about Australia's import regulations to protect against BMSB
    b. the compliance of the stakeholders listed above with Australia's import regulations to protect Australia from BMSB
    c. the need for import regulations on goods transported via air cargo, incoming mail or through passenger transport to protect Australia from BMSB.

BACKGROUND

PHA has been involved in several initiatives to help address the increased risks of BMSB to Australia, focused on surveillance, detection and management of BMSB. Australia is working closely with New Zealand on several biosecurity initiatives and priorities relating to BMSB.

Joint Workshop with New Zealand, September 2017

PHA and Better Border Biosecurity (B3) New Zealand held a workshop entitled 'Brown Marmorated Stink Bug: An Imminent Threat to Australia and New Zealand' in Brisbane on 25 September 2017. Participants were from the Australian and New Zealand governments, research organisations, funding bodies and industries. The workshop heard that models predicting regions in which BMSB would establish in Australia and New Zealand indicate the risk of establishment for large parts of Australia and New Zealand. It was recommended that further investigation is required to determine the effect of BMSB on Australian and New Zealand native plant species and that a surveillance strategy should be developed for Australia in consultation with work being undertaken in New Zealand. Australia and New Zealand are continuing work to pre-register potential chemical controls (emergency permits) for BMSB.

Research workshop, December 2018

The Plant Biosecurity Research Institute (PBRI) held a 'trans-Tasman' workshop on 4 December 2018 in Sydney to present the combined R&D efforts on the cross-sectoral pests BMSB and *Xylella fastidiosa*. The primary purpose of the workshop was to identify gaps in research and determine if there were opportunities to collaborate with New Zealand particularly with the increasing detections of BMSB in Australia and NZ.

As a result, two proposals on BMSB have been progressed by PBRI in collaboration with Better Border Biosecurity, New Zealand (B3 NZ).

- The first is the development of environmental DNA methods for detecting BMSB. This project will include a range of activities designed to evaluate the use of eDNA for the rapid detection of BMSB, including:
    - eDNA based assays for detecting BMSB and ground-truth sensitivity/specificity
    - eDNA sampling methodologies at ports and in the field
    - validation of real-time in-field eDNA detection
    - sensitivity of current detection methods and optimisation of surveillance protocols (for Australia) using a current BMSB outbreak situation (e.g. Santiago, Chile), and

    - training biosecurity officers in environmental sampling and real-time in-field eDNA testing for BMSB.
- The second proposal being developed will utilise the IBM deep learning system to develop an in-field diagnostic tool for identifying BMSB from indigenous species. The project will involve:
    - collating of an image library of the target species and other species that may be confused with BMSB
    - an artificial intelligence system that will then learn to identify and distinguish BMSB from others, and
    - deployment of an AI tool that could be deployed using mobile devices to enable in-field identifications of suspect species by surveillance teams and growers.

Wine Australia and Hort Innovation will co-invest in these proposals with interest in co-investment from B3, the Department of Agriculture and Water Resources, Wine NZ and Kiwi Vine Health NZ, mainly on the eDNA proposal. The workshop discussion concluded that it was important to work with affected trading partners on keeping BMSB populations down in their respective countries.

New Zealand action on BMSB

New Zealand has established a Brown Marmorated Stink Bug (BMSB) Council, part of the Government Industry Agreement for Biosecurity Readiness and Response (GIA), made up of horticulture industries and the Ministry for Primary Industries. The Council is seeking the following outcomes:

- maintaining and enhancing on-going public, importer and tourist awareness campaigns
- successfully and rapidly detecting BMSB post-border, eradicating any population(s) before BMSB can establish, and reducing the spread and establishment potential of any populations detected
- continuing to develop and improve readiness and response plans, including targeted research and development activities that will measurably improve the ability to respond to a BMSB incursion
- planning to reduce the impact of a BMSB incursion on production, processing and sales
- developing transition plans and funding arrangements for long-term management of BMSB, and
- enhancing the integrity and effectiveness of New Zealand's wider biosecurity system and enhancing the social license for BMSB activities.

Through implementing programs to address these goals, New Zealand has led the way on addressing the threat of BMSB from the perspective of reducing the risk of the bug arriving in New Zealand and preparing for its possible arrival and spread.

New Zealand has made significant progress in research on a biosecurity control agent, the Samurai wasp, for a potential incursion of BMSB in New Zealand. In August 2018 their EPA approved the importation and release of these wasps as a biocontrol for BMSB if an incursion of BMSB occurred. Further research is required on the suitability of this or other biocontrol agents for BMSB in Australia.

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