

National Bee Pest Surveillance PROGRAM

ABOUT THE NATIONAL BEE PEST SURVEILLANCE PROGRAM

The National Bee Pest Surveillance Program (NBPSP) is an early warning system to detect new incursions of exotic bee pests and pest bees. The program involves a range of surveillance methods conducted at sea and air ports throughout Australia considered to be the most likely entry points for bee pests and pest bees.

The surveillance program supports two primary objectives:

Early warning of exotic bee pests and pest bees

To act as an early warning system to detect new incursions of exotic bee pests and pest bees. This greatly increases the possibility of eradicating an incursion and limits the scale and cost of an eradication program.

Trade support

To facilitate the export of queen bees and packaged bees to countries sensitive to a range of bee pests and pest bees. The program provides technical, evidence-based information to support Australia's pest free status claims during export negotiations and assists exporters to meet export certification requirements.

Exotic bee pests targeted in the NBPSP include *Varroa* mites (*Varroa destructor*, *V. jacobsoni*) and the viruses these mites can carry, *Tropilaelaps* mites (*Tropilaelaps clareae*, *T. mercedesae*), tracheal mite (*Acarapis woodi*), large African hive beetle (*Oplostoma fuliginea*) and Asian hornets (*Vespa velutina* subspecies *nigrithorax*).

Exotic pest bees targeted include exotic strains of Asian honey bee (*Apis cerana*), giant honey bee (*Apis dorsata*), red dwarf honey bee (*Apis florea*), bumble bee (*Bombus terrestris*), and exotic strains of the European honey bee (*Apis mellifera*), including Africanised honey bees (*A. m. scutellata*) and Cape honey bees (*A. m. capensis*).

Regionalised pests such as braula fly (*Braula coeca*), small hive beetle (*Aethina tumida*) and Asian honey bee (*Apis cerana*) are also monitored in specific states and territories.

For more information about these pests, and the damage that they could cause if they entered Australia, or spread to other parts of Australia, please visit beeaware.org.au/pests

SURVEILLANCE METHODS

To detect these pests, a variety of surveillance methods are used by the NBPSP. Some of these methods include:

Sentinel hives

Hives of European honey bees (*Apis mellifera*) of a known health status that are maintained at locations believed to be of high risk throughout Australia. These hives are visually inspected every six weeks for large African hive beetle, braula fly and small hive beetle. Acaricides (miticides) are used to check for external mites. Samples of adult bees are taken to labs for diagnosis of internal mites and viruses.



Sentinel hives are set up at locations across Australia and are regularly inspected for exotic pests like mites

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Swarm and nest capture in port areas

Swarms and nests can be routinely found around port environments. For this reason, regular capture of swarms and nests of bees can lead to the early detection of exotic bee pests and pest bees.

Once captured these bees are examined to determine if they are established honey bees which have swarmed into the port environment, or any of the exotic bee species which have entered on an incoming vessel. Collected bees are examined for internal and external exotic mites and sent to the lab to see if they are carrying exotic viruses.

Catchboxes

Catchboxes positioned in high risk port areas assist in the early detection of exotic species of *A. mellifera* including Africanised honey bees (*A. m. scutellata*) and Cape honey bees (*A. m. capensis*).

Newly arriving swarms of European honey bee (i.e. inadvertently imported on cargo/vessels) as well as the local *A. mellifera* population may also be picked up using catchboxes and can subsequently be sampled for exotic mites on a regular basis.



Catchboxes are set up at ports to capture swarms that may arrive on vessels and cargo

Remote surveillance catchboxes

A remote surveillance catchbox is an empty hive fitted with a mobile phone camera and sensors that can detect when honey bees are present in the hive.

The phone captures an image at frequent intervals and performs image analysis to determine the presence of a swarm. The phone uploads an image on a daily basis or if activity is detected by image analysis. Power to the phone is provided by a solar panel and batteries in the catchbox lid. An electronic door on the catchbox entry can be triggered remotely to close and open the hive door.



Remote surveillance catchboxes have a camera and sensors to automatically send an alert if a bee swarm enters

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Floral sweep netting

Floral sweep netting has been proposed as the most efficient and effective surveillance method to provide early detection of high priority pest bees including the red dwarf honey bee (*A. florea*), the giant honey bee (*A. dorsata*), exotic and established strains of Asian honey bee (*A. cerana*), and European honey bee (*A. mellifera*) or bumble bees (*Bombus terrestris*).



Floral sweep netting is used to detect any foraging exotic pest bees.

Hobby beekeeper involvement

As part of the NBPSP, coordinators in each state or territory actively seek the involvement of local beekeepers in high risk port areas. Awareness training about exotic bee pests is provided and volunteer beekeepers are shown how to conduct routine surveillance on their hives.

COORDINATION OF THE SURVEILLANCE PROGRAM

In January 2012 the management of the National Sentinel Hive Program was transferred from Animal Health Australia to Plant Health Australia. This followed the transfer in responsibilities for bees at a national level from Animal Biosecurity to Plant Biosecurity. These changes have been made, and are continuing to be made, within state and territory governments.

The change in management prompted a name change to the National Bee Pest Surveillance Program.

The surveillance program is implemented nationally through the expertise of state and territory apiary officers and biosecurity staff, as well as volunteer beekeepers. Plant Health Australia's role includes:

- being the national coordinator and administrative contact for the program
- establishing and managing 5-year contracts with each jurisdiction and partners of the program
- ensuring the program is meeting objectives
- ensuring a relevant and up-to-date NBPSP Operations Manual is available to all coordinators so that consistent methods are used nationwide
- developing summaries of surveillance methods and techniques
- holding chemical use permits
- purchasing sticky mats and chemical strips on behalf of the program and distributing them to state or territory coordinators
- managing surveillance data provided by state or territory coordinators
- writing program reports for state and territories, national and international bodies, and NBPSP funding providers.



Australia has a healthy honey bee population and the National Bee Pest Surveillance Program is trying to keep it that way.

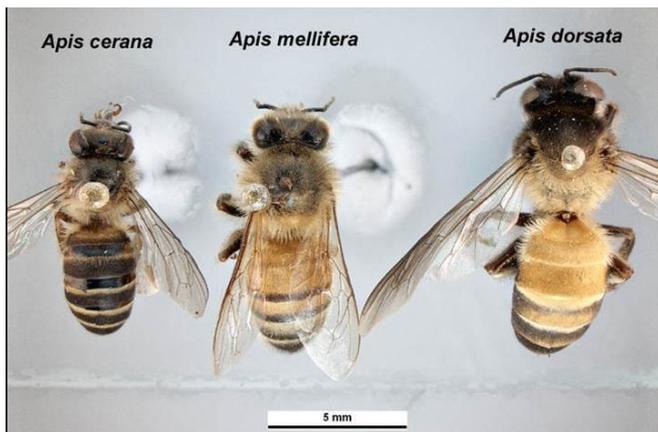
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PROGRAM IMPROVEMENTS

In 2013 CSIRO released their 'Risk assessment of ports for bee pests and pest bees'. The results of this survey were used to assist in the technical and statistical review and redesign of the surveillance program in 2016 (supported through Hort Innovation).

A number of improvements have been made to the program as a result, which will ensure effective targeting for bee pests and pest bees at all high-risk ports. These include:

- incorporating a total of 33 sea and air ports
- increasing sentinel hive numbers from 26 in 2011 to 178 in 2018
- inspecting and testing sentinel hives every six weeks
- repositioning sentinel hives and catchboxes around ports to ensure adequate coverage
- incorporating surveillance methods for exotic honey bee viruses, large African hive beetle and Asian hornets
- deploying improved remote surveillance catchboxes nationwide
- increasing floral sweep netting activities at 17 of the highest risk ports.



Comparison of three species of bees. L-R Asian honey bee (*A. cerana*), European honey bee (*A. mellifera*) and giant honey bee (*A. dorsata*). If you see any unusual bees, call the hotline on 1800 084 881.

RESEARCH PROJECTS

Australian Government Agricultural Competitiveness White Paper funding is contributing to a number of research projects. These projects will further enhance surveillance and the early detection of exotic pest bees and bee pests, and include:

- establishing an exotic honey bee virus diagnostic network with CSIRO and state laboratories
- improving remote surveillance catchbox technologies and sensitive in-swarm detection
- improving floral sweep mapping and netting skills at high risk ports
- developing and trialling Asian honey bee specific catchboxes
- trialling specific Asian hornet traps at key port locations
- developing a new management system to collate national data.

The research findings will be applied to the program by mid-2019.

PROGRAM REPORTING

The data and summary reports collected as part of the surveillance program are reported every six months to funders, stakeholders and all states and territories, and annually in the *Animal Health in Australia* (which is presented at the World OIE meeting) and the *National Plant Biosecurity Status Report*. These are the formal reporting avenues; however, requests for reports can be received at any time.

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FUNDING FOR THE PROGRAM

The Enhanced National Bee Pest Surveillance Program 2016-2021 is funded by \$2.5 million from Hort Innovation's Hort Frontiers Pollination Fund, part of the Hort Frontiers strategic partnership initiative. This includes contributions from nine pollination dependent industry research and development levies, \$500,000 from the Australian Honey Bee Industry Council, \$100,000 from Grain Producers Australia, and matched contributions from the Australian Government.

In-kind contributions for the implementation of the program are also provided through each state and territory's Department of Agriculture and volunteer beekeepers. At a national level, Plant Health Australia coordinates and administers the program.

Through the Agricultural Competitiveness White Paper, the Australian Government has provided a further \$587,000 to enhance the program. This funding will contribute to virus diagnostics and surveillance, increase Asian honey bee surveillance, improve catch-boxes in remote locations or areas of high risk, and trial Asian hornet traps at key ports. The White Paper is the government's plan for stronger farmers and a stronger economy.

Together, this provides over \$3 million of funding for the program, and is an excellent example of a strong industry-government biosecurity partnership in action.

**IF YOU SEE ANYTHING UNUSUAL,
CALL THE EXOTIC PLANT PEST HOTLINE**

1800 084 881

