



Varroa Mite

A little pest that delivers big problems

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Thank you to Johnathon Davey, Executive Director, Melons Australia for your assistance with this article.

On 24 June 2022, the NSW DPI announced the detection of *Varroa destructor* in one of their surveillance hives at the Port of Newcastle. What followed has become the largest and most expensive biosecurity response plan in Australia's history, but for many of us there are questions.

How did this serious pest arrive in Australia?

How big of a problem is it really?

And what are the consequences for food production in Australia if we can't control Varroa?

There are two species of Varroa mite; *Varroa destructor* and *Varroa jacobsoni*. The Asian honeybee is the original host to both varieties, however two sub-types of *Varroa destructor* have spread to the European honeybee. Unfortunately for European honeybees, they are far more susceptible to these little pests.

Varroa mites are tiny red-brown parasites that feed on honeybees, either in the brood or on adult bees. While the mite is small, when compared to its host, it is one of the largest parasitic mites in the world. According to Dr Cooper Schouten, the project manager for the Bees for Sustainable Livelihoods Research Group and Lecturer at Southern Cross University, 'For a human, it would be like having a dinner plate sized tick on you'.

How does the Varroa mite affect a honeybee?

Varroa feed on the fat body (an organ akin to the liver in humans) by piercing through a membrane layer underneath the abdominal plates of the bee. They inject an enzyme that destroys the vital structure of the fat body, which allows the mite to more easily consume the fat. This process weakens the bee, leading to lower immunity, shorter lifespans and greater susceptibility to viruses. Left unchecked, the mites spread through the colony, causing parasitic mite syndrome, and ultimately the death of the hive.

How did Varroa mite get to Australia?

While Varroa mites are found in every other beekeeping area in the world, until now it has not managed to become established in Australia. As to how it has now made its way to Australia, this is unknown – it may have arrived via a transport container, it may have been present on a Queen bee intentionally smuggled in, or it may have come from another, unknown source.

At present, the infestation is believed to be contained within a series of defined zones within New South Wales. Activities taken so far to contain the outbreak have included the widespread euthanasia of both feral and managed hives.

There are strict permits in place for movement of hives to prevent the further spread, and the NSW DPI is reminding beekeepers across the state to carry out mandatory surveillance on their hives.

During the course of the response, the zones have been expanded as more and more mites have been found.

What do the emergency zones mean?

- The **red** represents the 10km eradication zones where honeybee hives will be euthanised.
- The **purple** shows the 25km surveillance zones, where officials are monitoring and inspecting managed and feral honeybees to limit the extent of these incursions.

We are fortunate in that there do not appear to be any passionfruit growers in a red zone, however we are conscious this may change. For those who are reliant on European honeybees for pollination, we have been observing other industries to understand what 'work arounds' are being trialled to ensure that pollination of crops can still occur.

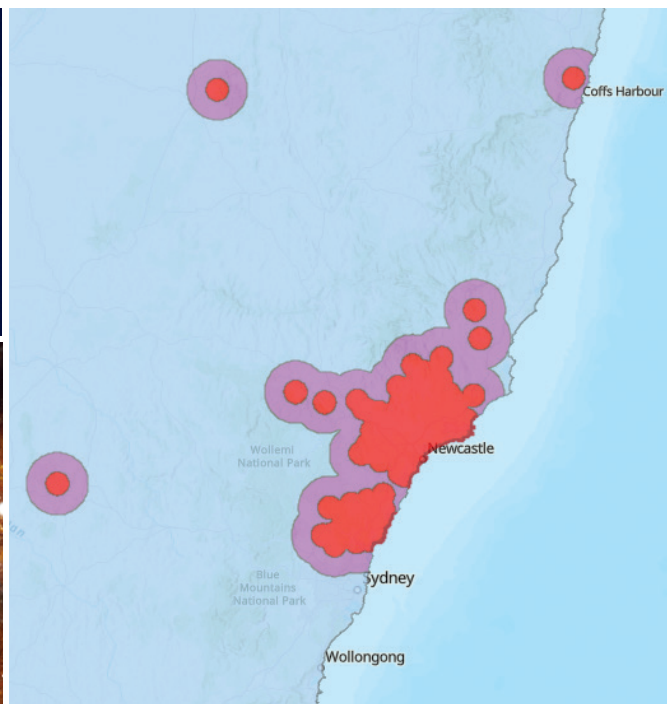
You can follow the *Varroa mite response* and get updates at:

www.dpi.nsw.gov.au/emergencies/biosecurity/current-situation/varroa-mite-emergency-response



Close-up of a Varroa mite and an adult female Varroa mite feeding on a developing bee.

Photo credit: Scott Bauer,
USDA Agricultural Research Service, Bugwood.org



The latest version (17 July 2023) of the Varroa mite emergency zone map showing the Red and Purple zones around infected hive detections.

Source: www.dpi.nsw.gov.au/emergencies/biosecurity/current-situation/varroa-mite-emergency-response

Can Varroa mite be eradicated and at what cost?

At this point there is a general consensus that eradicating Varroa is still technically feasible. Further, the costs of eradicating Varroa are minimal compared to the cost and consequences of having to live with it (the cost of Varroa establishing in Australia has been estimated at an eye-watering \$70 million per year).

The cost of eradication will be shared across 16 affected industries, the Commonwealth Government and State and Territory Governments and further funding directly from the NSW Government, under a formal cost sharing arrangement.

While the costs to eradicate are high, without feral hives to aid in pollination, growers will need to rely entirely on alternative pollinators as well as managed hives, which themselves will attract higher costs as beekeepers will need to actively monitor for and control Varroa mites.

How has Varroa mite affected crops in other countries?

The New Zealand experience of a *Varroa destructor* invasion commenced in April 2000, when the mites were detected in Auckland. A response was abandoned as Varroa was considered to have already become established. Since then, there have been dramatic declines in feral bee colonies, leaving agriculture to rely almost solely on managed hives, which have themselves become more expensive⁵.

Unfortunately for the industries involved, we will have to pay our share of the response costs. The total cost is still being worked through, and we anticipate being able to communicate these, along with the specific party breakdowns in the coming month. Fortunately, the Federal Government has agreed to underwrite Passionfruit Australia's contribution for ten years, which will allow us to amend our existing levy to repay the money, or find another method to repay the loan.

PAI's committee and secretariat have spent considerable time and resources keeping abreast of this program and addressing the passionfruit industry's interests in this regard. The passionfruit industry is legally required to assist in funding control measures and there will be future communications with the industry on funding options as soon as the options have been properly explored.