Australian Government
Department of Agriculture, Fisheries and Forestry

Investigation into the origins of the Varroa mite incursion in Williamtown area

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Acknowledgement of Country

We acknowledge the continuous connection of First Nations Traditional Owners and Custodians to the lands, seas and waters of Australia. We recognise their care for and cultivation of Country. We pay respect to Elders past and present, and recognise their knowledge and contribution to the productivity, innovation and sustainability of Australia's agriculture, fisheries and forestry industries.

Foreword

Australia's agricultural sector faces ongoing challenges from biosecurity threats, with the Varroa mite incursion in Williamtown representing a significant event for our nation's beekeeping and food production industries.

This report details the collaborative investigation undertaken by government agencies and research institutions to trace the origins of the outbreak and inform future responses.

The findings highlight the complexity of biosecurity management and the importance of continued vigilance, scientific inquiry, and cooperation across jurisdictions. As we move forward, the lessons learned from this investigation will strengthen our collective ability to protect Australia's vital agricultural resources.

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Summary

The Rural and Regional Affairs and Transport References Committee Inquiry - adequacy of Australia's biosecurity measures and response preparedness, in particular with respect to foot and mouth disease and Varroa mite - recommended that the Department of Agriculture, Fisheries and Forestry (the department) and the New South Wales Department of Primary Industries now the Department of Primary Industries and Regional Development (NSW DPIRD), publicly report on findings from their investigations into the origin of the Varroa mite incursion in the Williamtown area.

This report presents the findings of a comprehensive investigation into the origins of the Varroa mite incursion in Williamtown. Despite extensive review of digital and physical evidence seized during the investigation, as well as genetic testing, no direct evidence was found implicating any entity in illegal importation of bees infected with Varroa mite.

Analyses conducted by the NSW DPIRD, Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Australian National University (ANU) indicate the outbreak likely stemmed from a single introduction, but subsequent genetic diversity and hive movements complicated efforts to pinpoint the source.

The investigation concluded with no prima facie evidence of a criminal offence, which was confirmed in consultation with the Commonwealth Director of Public Prosecutions (CDPP). The department will re-evaluate the investigation should new evidence become available.

Introduction

On 6 May 2023, NSW DPIRD referred information to the department regarding the NSW Varroa Mite Emergency Response. As a result of that information, the department commenced an investigation into a potential breach of the *Biosecurity Act 2015* (Cth) (Biosecurity Act) relating to the Varroa mite incursion and its pathway into Australia.

The investigation sought to clarify the circumstances surrounding the Varroa mite incursion by leveraging scientific expertise and cross-jurisdictional cooperation to inform Australia's biosecurity response and preparedness.

The investigation involved extensive domestic and international inquiries, the execution of search warrants across multiple locations, and close collaboration with NSW DPIRD and CSIRO. These partners conducted detailed epidemiological and genetic analyses of mite samples from hives around Newcastle, providing insights into the outbreak's origins and spread.

Findings

An examination of the digital and physical evidence seized during the investigation did not identify any direct evidence of any entity committing offences pursuant to the Biosecurity Act.

The results from both the search warrant digital data and genetic testing were inconclusive as to the possible source of the Varroa mite incursion. In addition, the evidence does not indicate owners associated with properties initially infested with Varroa mite were involved in the illegal importation of bees infected with Varroa mite.

Analyses conducted by NSW DPIRD, CSIRO and ANU indicate the outbreak likely originated from a single, small introduction of mites. While evidence points to possible origins in Kempsey and or Newcastle, the exact timing and source of the incursion remains inconclusive due to limitations in available data and testing. It cannot yet be conclusively determined when Varroa mite entered Australia.

The department consulted with the CDPP who agreed that based on investigative findings no prima facie evidence existed. The investigation has since been finalised, however should new information become available the investigation can be re-evaluated.

Detection and Genetic Testing

In June 2022, the NSW DPIRD detected Varroa mites within sentinel hives around the Port of Newcastle. Subsequent investigations revealed that numerous hives in and around Newcastle were infested with Varroa mites to varying degrees.

The ANU analysed Varroa mite samples from hives around Newcastle. Their epidemiological analyses suggested that the outbreak originated from a single, small introduction of mites. Further testing and data analysis identified a heavier Varroa mite infestation some distance away from the Port of Newcastle. Based on this finding NSW DPIRD considered it unlikely the Varroa mite were introduced by hitchhiking on bees through the port.

Researchers from the ANU conducted genetic analysis and at the time provided advice that the Varroa mites likely originated from North America, most probably Canada.

Genomic evidence indicated likely incursion points in the initial days of the Varroa mite response. The infestation rates suggested the outbreak may have begun between June 2021 and March 2022. By mid-2023, about 12 months into the response, Varroa mites were detected in Kempsey, NSW, approximately 230 km north of Newcastle.

Testing within the Kempsey area suggested the Varroa mites were introduced around January 2023. However, due to extensive infestation and inconclusive data patterns, which may suggest Varroa mite suppression by apiarists, it is possible the infestation began much earlier.

NSW DPIRD and CSIRO now believe that Varroa mite may have originated in Kempsey or arrived in Kempsey and Newcastle around the same time. It is possible infected bees had been moved to Newcastle prior to Varroa mite being identified in the sentinel hives. Viruses identified on the Varroa

mites and bees link the two regions and rule out the possibility of two separate Varroa mite incursions.

There is currently inconclusive data and testing to indicate where the Varroa mites may have originated from in Kempsey. Additionally, an exact date period for when the Varroa mite infestation commenced in Kempsey has yet to be confirmed. As the region of Kempsey was outside the original quarantine zone, hive movements continued for at least a year after the Varroa mites were identified in the sentinel hives.

It cannot yet be conclusively determined when Varroa mite entered Australia based on the testing and data from NSW DPIRD. Whilst the Newcastle data indicates the infestation possibly commenced around June 2021, it could have been earlier due to inconclusive data from the Kempsey region and the possibility Varroa mite was being treated for some time prior.

Further inquiries were carried out by CSIRO around the earlier mite genome comparison. On the basis of this work, CSIRO advised that they had no confidence in any conclusions in relation to the international origin of the Varroa mite. CSIRO stated that there is a considerable amount of heterogeneity between sample collections, often associated with loss of genetic diversity. As Varroa was moved around Australia, each subsequent population became increasingly dissimilar to the one that arrived initially, making a global comparison of mite genomes difficult.

In May 2025, NSW DPIRD advised that recent studies in collaboration with a university researcher in relation to a virus that is carried by the Varroa mite, now suggested a likely overseas origin. NSW DPIRD is continuing to pursue this line of inquiry and is liaising with overseas contacts to obtain virus samples that might provide more conclusive evidence of the international origin of both the virus and Varroa mites that were detected in Australia in 2022.

Origins Investigation

The department’s investigation into the origin of the Varroa mite incursion in the Williamtown area has involved the execution of 19 search warrants across Australia. These warrants resulted in the seizure and analysis of a significant volume of digital data and physical exhibits. Interviews were also conducted with a number of persons of interest.

An examination of the seized digital and physical evidence was conducted, which did not identify any direct evidence that any entity had committed offences.

Both digital data and genetic testing is inconclusive as to the possible source of the Varroa mite incursion. Despite considerable investigative resources utilised in the investigation, the evidence does not indicate owners associated with properties initially infested with Varroa mite were involved in the illegal importation of bees infected with Varroa mite.

Conclusion

The department consulted with the CDPP who agreed that based on investigative findings no prima facie evidence existed. The investigation has since been finalised, however should new information become available, the investigation can be re-evaluated.