

VG15013 Improved Management options for Cucumber Green Mottle Mosaic Virus (CGMMV)

CGMMV AND EUROPEAN HONEY BEES: RESEARCH UPDATE - FEBRUARY 2018

Cucumber green mottle mosaic virus (CGMMV) is a plant disease which was exotic to Australia until September 2014.

There is strong evidence that honey bees can introduce CGMMV into clean cucurbit plants. Trials in Israel have shown that bees are able to transfer CGMMV from infected cucurbit plants to clean cucurbit plants in a shade house under specific conditions (Darzi et al 2017). Two honey bee field trials have been conducted in the Northern Territory and each time, CGMMV was found in the flowers but not the leaves thus suggesting an introduction by pollinators.

Hive products from the Northern Territory and Queensland have been tested for the presence and viability of CGMMV. All hive products (adult bees and brood, honey, pollen, empty cells, propolis) have been shown to contain CGMMV. Of those samples tested pollen, honey and adult bees have the highest prevalence of CGMMV. The viability of CGMMV in hive products has been tested. So far, viable virus (capable of causing infection in plants) has been isolated from pollen, honey and adult bees.

It is not known how long CGMMV remains viable inside bee hives. Viable samples of CGMMV have been collected from bee hives in the Northern

Territory and Queensland in 2017, but we suspect that the source of this virus is a recent reintroduction rather than the virus persisting over years. Pollen samples from hive product testing have been reserved for future work to determine what plant species the CGMMV is coming from.

The Hort Innovation VG15013 project team is currently finalising a sampling protocol for the detection of CGMMV in bee hives. It is likely that this protocol will recommend taking small samples (e.g. three bees, three pollen cells) from multiple hives within an apiary.

We do not understand how bees move CGMMV around in the environment. The crucial question is, can honey bees move live virus out of their hive to infect clean plants? This would present a significant risk if managed pollinators are exposed to the virus and then moved between locations. We are pursuing opportunities to continue this work.

Darzi, E., Smith, E., Shargil, D., Lachman, O., Ganot, L., & Dombrovsky, A. (2018). The honeybee *Apis mellifera* contributes to *Cucumber green mottle mosaic virus* spread via pollination. **Plant Pathology** 67(1) 244-251.

For further information please contact:

Project leader: Dr. Lucy Tran-Nguyen
Principal Molecular Scientist

Department of Primary Industry and Resources

E: lucy.tran-nguyen@nt.gov.au

P: 08 8999 2235

