

**Hort
Innovation**



Bees and virus transmission – an industry perspective

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Summary

- ▶ Overview of industry
- ▶ Seedless watermelons
- ▶ Dependence on pollinators
- ▶ CGMMV – impact on industry
- ▶ Research

The melon industry

The Australian Melon Industry consists of approximately 250 growers producing around 200,000 tonnes of melons annually on 6,000 - 8,000 hectares.



30% rockmelon



10% honeydew



60% seedless watermelon

Production and Research

The industry has:

- a research & development levy
- A Plant Health Australia (biosecurity) levy
- An Emergency Plant Pest Response levy



Seedless pollination

- ▶ Seedless watermelons (triploid) are a hybrid between a tetraploid (female fruiting parent) and a diploid (the pollinator).
- ▶ Growers plant seedless and seeded plants in a ratio of 4:1.
- ▶ Fruit set of seedless watermelons (and diploid) can be induced by either pollination or application of growth regulators.
- ▶ Triploid watermelon has undeveloped whitish seed coats and 3-5 real seeds.

Fruit set

- ▶ Fruit set of seedless watermelons is affected by weather, plant growth, fertilizer, water and bee activities.
- ▶ Diploid watermelons requires at least **8-10 bee visits** between 6 - 10 am.
- ▶ Seedless watermelon require at least **16 bee visits** before 10 am.

Cucumber green mottle mosaic virus

Detected in 2014 in Northern Territory.

Most likely due to seed transmission.

Subsequently, in Queensland and Western Australia.

Thirteen melon farms affected over 3 years + other cucurbit farms

Destroys over 30% of crop.

Losses estimated at \$40 million.



Impact of CGMMV

- Initial quarantine (2 years) followed by other farm regulation.
- Ongoing infections.
- Long lasting and highly transmissible in soil & organic material.
- No resistance in melon varieties and no control methods, other than long rotations and clean seed.
- Australia now has the highest level of testing for seed-borne virus in the world.
- CGMMV National Management Plan developed.

Bees and CGMMV

- ▶ CGMMV found in all bee & hive parts including larvae, and workers, pollen, wax, honey and bee bread.
- ▶ It is not known what, if any, contribution bees, and beekeeping practices, make to the transmission of the virus between host plants and between sites.
- ▶ CGMMV is transmitted by artificial pollination, most likely by mechanical damage.
- ▶ Research currently occurring in Israel and Australia.
- ▶ In Queensland, CGMMV-infected hives cannot be moved off farm.

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