

2019, NSW

# Pollinators of watermelon

Griffith, NSW

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## Thank you for participating in our watermelon research project.

We'd like to share some preliminary results from the 2019 season and give you a brief introduction to what we will be doing in the future. We hope you are keen to participate in our research again.



### A little information about pollination ecology:

Our research focuses on observing flower visiting insects in crops and assessing their efficiency as pollinators. Honey bees are versatile and efficient pollinators in many crops, but many wild insects, including native bees, wasps, flies, beetles, and moths, can be more efficient crop pollinators. Wild pollinators can provide pollination insurance as environmental changes occur. As such, it is important to observe and catalog existing pollinator communities in Australian crops.

Intensive management practices and chemical use in agricultural landscapes are putting increased pressure on wild pollinators in other parts of the world, but little is known about the impacts of these factors on Australian pollinators. In our research, we hope to collect information about management practices, land use, and environmental variables in an attempt to understand how pollinator communities might be affected by different management practices.

*"Wild pollinators can be diverse and include social and solitary bees, flies, moths, and butterflies"*



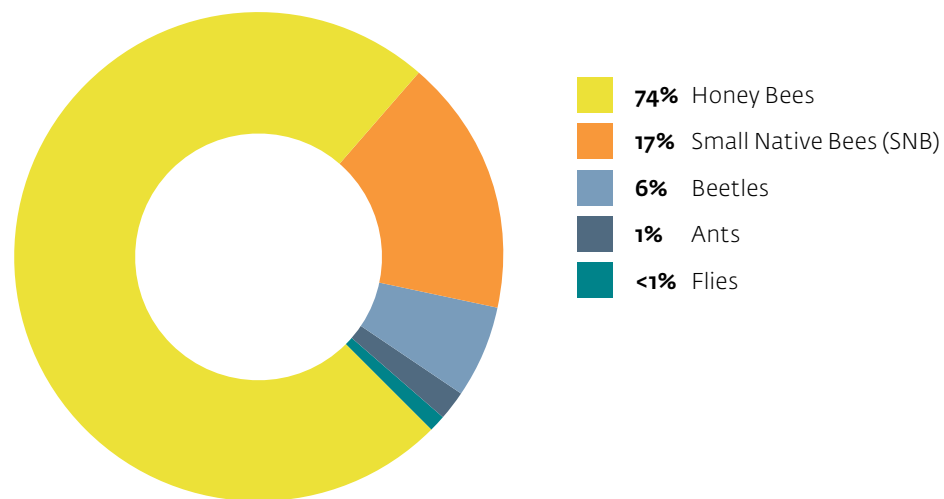


# What insects are visiting watermelon flowers in Griffith?

We saw 511 insect visiting watermelon flowers.

**Honey bees** were the most common visitor on watermelon flowers, making up **74%** of the total visits. **Small native bees** were the second most common insect visitor at **17%**. During our insect collections we found several species of native bees that we grouped into the 'small native bees' category for our analysis. *Homalictus*, *Lasioglossum*, and *Lepotriches* species were all found visiting watermelon flowers.

## Insect Visitor Pie Chart

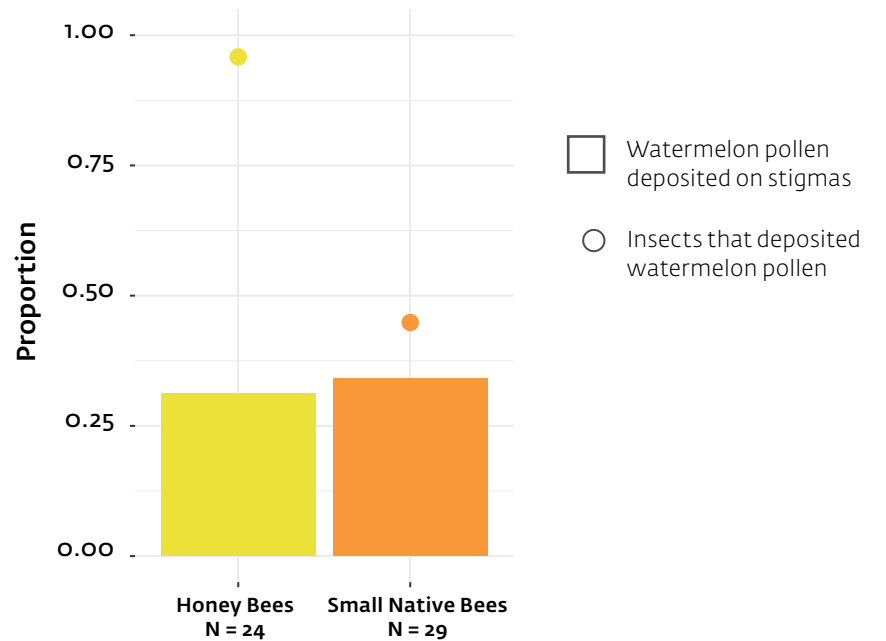


The frequency of insect visitors to watermelon flowers. Frequency was calculated by dividing the number of visits for each insect by the total number of visits. Honey Bees = wild and managed *Apis mellifera*.

# Pollinator Efficiency

Pollinator efficiency is calculated as the number of watermelon pollen grains deposited by a visit from an individual insect. To assess the efficiency of small native bees and honey bees in watermelon, we observed insects visiting virgin flowers and then counted and identified the pollen they deposited on the watermelon stigma.

We found **96% of honey bees** and **46% of native bees** are depositing watermelon pollen onto stigmas. Also, small native bees deposit about the same amount of watermelon pollen as honey bees per visit.

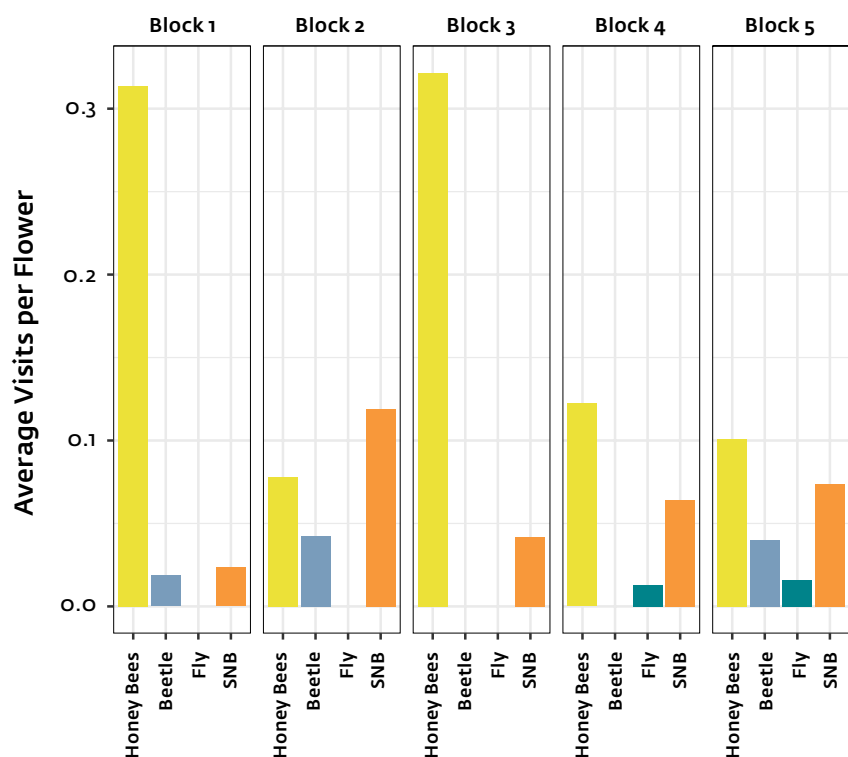


# Visitation Rates of Bees in Watermelon

Honey bees and small native bees (SNB) are present at all sites. Honey bees in this report are both managed and feral colonies, as we are not able to distinguish between the two during transect observations. Ants and beetles are not that common and are not found

at all sites. Some blocks are dominated by honey bees, while others are co-dominated by small native bees and honey bees. This variation indicates that there may be landscape variables affecting native bee and feral honey bee populations in the region.

Visitation rate is not significantly different between small native bees and honey bees, although there is a trend showing that honey bees are the dominant watermelon pollinator in the region.



The visitation rates for insect visitors at each farm site. Each grid section is a farm-block combination. Visitation rate was calculated for each transect by summing the visits for each insect and dividing by the total number of flowers observed. Mean visitation rate is represented by the black diamonds.



The visitation rates for Honey bees (*apis*) and small native bees (*snb*). Visitation rate was calculated for each transect by summing the visits for each insect and dividing by the total number of flowers observed. The predicted average visitation rate is represented by the black dots and the error bars represent the standard error.