NSW GOVERNMENT
Department of Primary Industries
primefact

Best practice bee management in macadamia

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Bees (honey and native) and other insects play a critical role in pollinating macadamias. Inadequate pollination results in poor nut set and lower crop yields. It is important to have bees and other insect pollinators in the orchard at flowering to ensure successful pollination (Figure 1) and setting up the crop potential for the season to come.

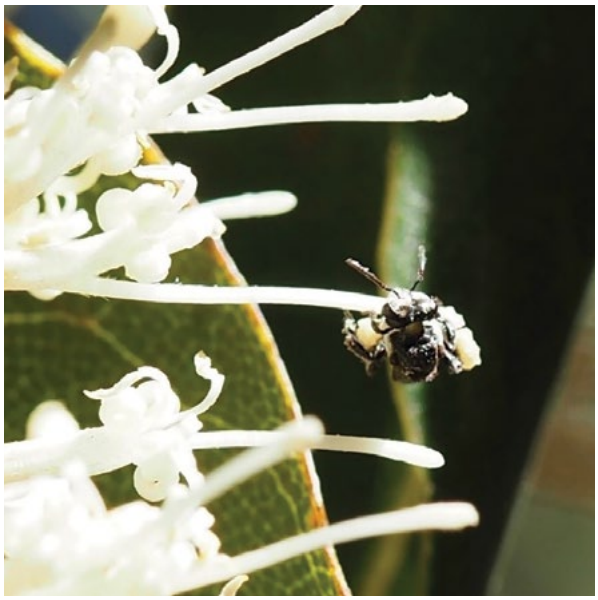

Figure 1. A native bee pollinating a macadamia flower. Photo: Chris Fuller.

Strategies to consider for protecting bees

Communication

Communication between the beekeeper, grower, spray operator and neighbours is vital, especially as honey bees can easily fly two kilometres from their hive to forage on flowers.

The BeeConnected app (Figure 2; https://www.croplife.org.au/resources/programs/beeconnected/) is a digital tool for growers who would like to be informed of, and be connected with, beekeepers near their farm, and beekeepers who want to be informed of crop protection activities near their beehives.

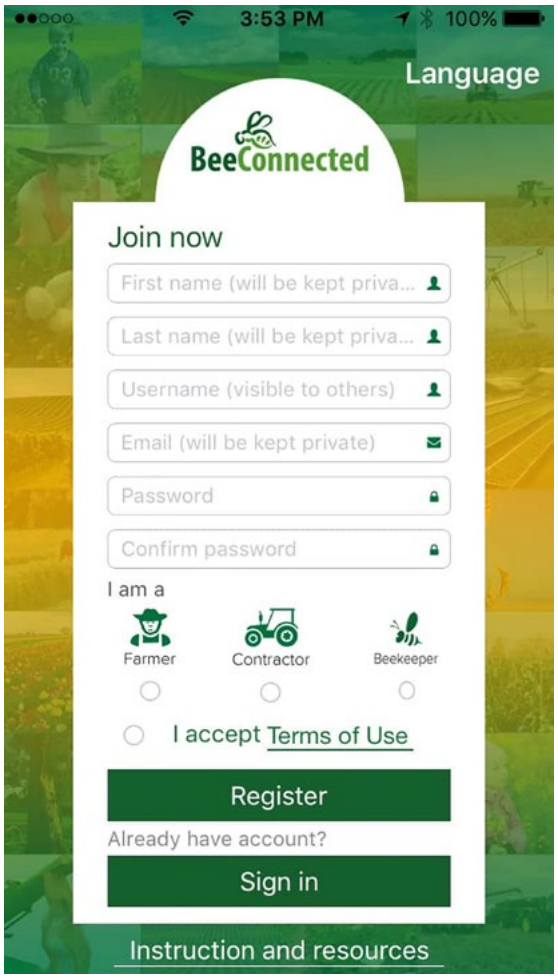

Figure 2. The BeeConnected app enables farmers, contractors and beekeepers to be connected. Source: CropLife.

As a BeeConnected user, growers input the location of their property. If this is within 10 km of a BeeConnected registered hive, the app will notify both the grower and beekeeper to enable proactive discussion relating to orchard activities and maintaining hive health.

When engaging in commercial pollination services, growers and beekeepers should agree upon each other's responsibilities in at least the following areas:

- pesticide applications
- number of frames/health of hives
- date and location for hive placement
- accessibility of colonies to beekeepers
- date of hive removal from the orchard.

Hive placement and bee care

Hive and colony strength should be assessed upon arrival by the beekeeper or a third-party auditor. This inspection should be observed by the grower.

To maximise pollination and protect bees from drinking pesticide-contaminated water, beekeepers and growers should ensure clean water is always available. Water supplies will need to be cleaned and refreshed regularly.

Hives should be placed:

- evenly throughout the orchard for better pollination i.e. not banked up in one area (Figure 3)
- where they are accessible and convenient at all hours for servicing and removal (Figure 4)
- with eastern and northern exposures for hive openings to encourage bee flight
- away from areas prone to shade or flooding
- where water sources can be covered or removed before a pest control treatment or emptied and refilled after treatment is made
- where alternative pollen sources for good colony strength and bee health are available; this could include flowering boundary plants.

Figure 3. Beehives should not be banked in one area.

Figure 4. A native beehive hotel. Photo: Chris Fuller.

Spray management

Pest inspections at pre-flower are recommended. Ideally you should have a pest scout check the green racemes (Figure 5) for the build-up of typical flower pests such as macadamia lace bug or felted coccid. An early strike on these pests will avoid the need for spraying while the crop is in full bloom.

Always warn nearby beekeepers of your intention to spray in time for them to be able to take all necessary steps to protect the bees. Give at least two days' notice and advise nearby farmers and neighbours.

Figure 5. Inspect green racemes for pests.

Spraying should occur late in the afternoon or evening (be aware of inversion layer conditions) when bees are not foraging and pollen is not present.

Always turn off nozzles when near beehives, even if at night and avoid directly spraying bees in flight or beehives. Bees that come in contact with agricultural sprays will not be able to fly because of the weight of the spray droplets on their wings.

Avoid spray drift at all times and never spray in conditions where spray might drift onto adjacent properties that could be supporting foraging bees.

If there is any flowering weed growth in or near the orchard, mow it before spraying orchards.

Chemical choice

When choosing chemicals to use in your orchard:

- always choose short-acting chemicals
- always follow the warnings on pesticide labels (Figure 6)
- dispose of waste chemicals or used containers correctly (for example, use the drumMUSTER program, http://www.drummuster.org.au/)
- be very careful if you use surfactants because these are designed to improve the effectiveness of chemicals by decreasing the droplet size or increasing the penetration of the chemicals into a plant or insect. Surfactants allow the water to penetrate the body hairs, which will kill bees
- aim to have your spraying finished at least 6 hours before bee activity.

PROTECTION OF WILDLIFE, FISH, CRUSTACEANS AND ENVIRONMENT
DO NOT contaminate streams, rivers or waterways with the chemical or used containers.
Dangerous to fish and other water-borne organisms.
Dangerous to bees. DO NOT spray any plants in flower while bees are foraging.

Figure 6. An example of a chemical label showing the warnings specific to bees.

Do not spray when bees are active

Further information

Wallace HM. 1999. Bees and the pollination of macadamia. *The Australian Macadamia Society Technical Papers*. https://beeaware.org.au/wp-content/uploads/2014/06/Bees-and-the-pollination-of-macadamia.pdf

Reference number: PUB20/**106**.