

Groundbreaking insights to help secure pollination in raspberries

European honey bees are abundant pollinators of raspberries, but new research has revealed that native bees also play an important role that has been overlooked.

That's one of the key findings for the raspberry industry from the project, *Securing Pollination for more Productive Agriculture: Guidelines for effective pollinator management and stakeholder adoption*, delivered as part of the Australian Government Department of Agriculture, Water and the Environment Rural R&D for Profit program.

The four-year project saw Australia's most knowledgeable bee and pollination researchers assess the contribution of pollinators to a range of pollination-dependent crops including raspberries, from June 2016 to February 2021.

Its recommendations are aimed at strengthening pollination security and resilience, and optimising yield by identifying the insects that contribute to crop pollination and the way they relate to the landscape.

Key findings

Researchers identified crop visitors and assessed their abundances on raspberry crops in the Coffs Harbour region of NSW and in Victoria's Yarra Valley. They also investigated the pollination efficiency on raspberries of the most abundant pollinators.

The nesting resources that support stem-nesting bees that pollinate Rubus crops, both in the orchard and in nearby forest habitats were also examined.

Dr. Julian Brown said the study identified several native bee species visiting raspberry flowers.

"The most common native bees detected visiting flowers and carrying pollen in Victorian Rubus berry crops were reed bees (*Exoneura* species) and furrow bees (*Lasioglossum* species)," Dr Brown said.

"We also examined how important native bees are as pollinators, and how growers can encourage visitation.

"We found that bee pollination had a big impact on the size and shape of berries, and that a visit from a native bee was just as good as a visit from a honey bee."

Top crop visitors

In the Coffs Harbour region, honey bees were the main visitors to raspberry flowers, accounting for 71% of flower visitation.

Stingless bees, *Tetragonula carbonaria*, were also frequent visitors to raspberry flowers, providing 26% of visits.

The ground-nesting solitary bee *Homalictus urbanus*, an occasional visitor, contributed the remaining 3% of observed visits to raspberry flowers.

Dr. Romina Rader said both stingless bees and ground-nesting bees may be suitable species for targeted farm management practices to increase nesting habitat and nutritional resources to enhance crop pollination service delivery by wild pollinators.

Who is visiting your raspberry farm?

Honey bees are the most common pollinator for raspberries, but many other species are just as effective.

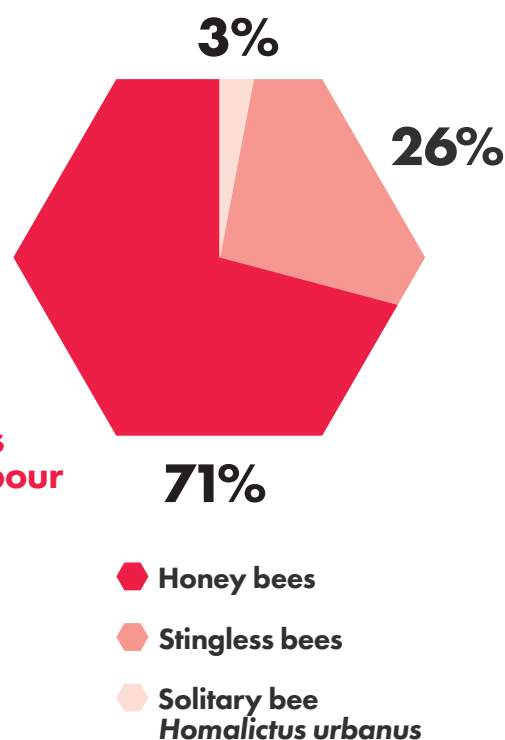
The Securing Pollination for More Productive Agriculture: Guidelines for effective pollinator management and stakeholder adoption project studied raspberry farms to determine what insects were visiting.



Coffs Harbour

Did you know?
Targeted farm management practices to increase nesting habitat & nutritional resources can help enhance crop pollination service delivery by wild pollinators.

Did you know?
Bee pollination had a big impact on the size & shape of berries & that a visit from a native bee was just as good as a visit from a honey bee.



This project is supported by funding from the Australian Government Department of Agriculture, Water Resources and the Environment as part of its Rural R&D for Profit program.

Project partners include Horticulture Innovation Australia, University of Sydney, University of Adelaide, University of New England, Adelaide and Mount Lofty Ranges Natural Resources Management Board, Almond Board of Australia, Apple and Pear Growers Association (SA), Australian Mango Industry Association, Australian Melon Association, Australian National University, Costa Group, Department of Environment Water and Natural Resources SA, Greening Australia, Lucerne Australia, Native Vegetation Council Natural Resources Northern and Yorke, O'Connor NRM, Primary Industries and Resources SA, Raspberries and Blackberries Australia, South Australian Apiarist Association, Terrestrial Ecosystems Research Network Eco-informatics, Trees For Life.

Busy little reed bees

Reed bees were the most common flower visitor in some berry orchards, and not only nest in berry crops but pollinate them too.

Reed bees are small (6-8mm long), and usually have a black head and thorax and a red-brown abdomen. There are many species in Australia, mostly found in wetter temperate regions, and are generalists, visiting a range of crop and native plants.

The name 'reed bee' refers to the habit of females to dig a nest in pithy stems of plants such as tree ferns, and grass trees, although they rarely nest in reeds. They also nest in non-native plant species such as lantana, brambles and berry canes.

Researchers found reed bees nesting in the canes of raspberry and blackberry, meaning the rubus berry orchard environment provides them with both a home (nests) and food (flowers).

Reed bees will nest in dead canes that they can enter at a damage point or an opening created by pruning. However, because the bees do not tunnel through live tissue, they do not harm the plant.

They prefer canes that are upright and not too thick (stems less than 9mm diameter were preferred). Further research is needed to find out which pruning strategy can help bee nesting, and researchers are encouraging growers to make their own observations.

Areas of the orchard with more nests in canes also had more reed bee visits to flowers, confirming the bees live and work locally.

Reed bees actively forage for most of the year, although less so in winter, and as a result, require floral resources outside of crop flowering times. They forage on native plants such as Acacia and Hakea before crops were flowering, and Kunzea and Pultenaea after crops finished flowering.

They can forage as far afield as one kilometre from their nest, meaning your local area and bushland may provide many of these flowering resources at different times of year and support your on-farm pollination.

