Best Practice Pollinator Management for the Rubus Industry (RB23002)

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Raspberry and blackberry growers have invested their research and development levy through Hort Innovation into a new project 'Best Practice Pollinator Management for the Rubus Industry' that is being delivered by the University of Melbourne. The main aim of this project is to provide Rubus growers with information about which insects, other than honeybees, are likely pollinating Rubus in their growing region and system, and what can be done to support these pollinators on their farms.

This project is particularly timely given the introduction of Varroa mite into Australia. This global honeybee pest may reduce pollination services provided by honeybees, but will not impact our native pollinators. Different native pollinators are present in different regions, so this study will develop region specific recommendations as a safety net for the Rubus industry's future.

Pollinating insects are important for Rubus production. Insects can move pollen within and between Rubus flowers and in doing so can increase fruit quality (e.g. number of drupelets), even in self-compatible varieties, by ensuring that more stigmas receive pollen. In Australia, Rubus pollination is often performed by managed and feral European honeybees. We currently have the highest densities of feral honeybee colonies in the world, making these bees an abundant resource for Rubus growers. With the recent arrival of the Varroa mite that has been responsible for honeybee colony collapses overseas, it is important to understand the reliance of Rubus production on these bees, and the role that alternative pollinators (e.g. native bees) can play.

One goal of this project is to understand the range of insects that pollinate Rubus flowers in Australia. There is already some evidence that native Australian insects pollinate Rubus. Notably, past studies have shown native reed bees (*Exoneura* species), furrow bees (*Lasioglossum* species), and stingless bees (*Tetragonula* species) to be effective pollinators of Rubus flowers in certain regions of Australia.

Our team's first task is to bring together existing knowledge about native insect pollinators, their known effectiveness, and information about where they are commonly found pollinating Rubus crops. Existing datasets and studies are, however, quite limited and regionally restricted.

To supplement existing knowledge, our team will be conducting extensive field work across south-east Queensland, northern NSW, Victora, Tasmania, and southern WA to gain a systematic understanding of the range of insects that provide important Rubus pollination services across Australia's primary Rubus production regions.

Native Reed bee on Rubus. Photo Credit: Alison Hoelzer

Another goal is to understand what growers can do to support Rubus pollinators on their farms. Again, we will synthesise existing knowledge, but our field work will also provide new information on possible management practices. Crop-pollinating insects often require non-crop flowers to provide pollen and nectar when crops are not flowering, and to provide a diversity of nutrients to maintain healthy insect populations.

When there are multiple pollinator species visiting crop and non-crop flowers, and limited space for growing non-crop flowers, it is important to select the plant species that will maximise support for the crop-pollinator community. We will collect data on the range of floral resources that Rubus pollinators use in each region, and then use computer algorithms to determine the sets of non-crop plants that maximise crop-pollinator diversity so that growers can make the best use of space available for planted flowers that maximise pollinator services to Rubus crops.

An important part of this project will be working with the research team from the current strategic levy investment project 'Integrated pest management approaches to address pest challenges in raspberry and blackberry (RB21000)' which is part of the Hort Innovation Raspberry and Blackberry Fund, to facilitate integration of Rubus pollinator and pest management. For instance, it may be possible to determine which set of non-crop plant species simultaneously maximise pollinators and natural enemies of Rubus pests within and surrounding Rubus fields.

We will make our findings available to growers in several ways. We will provide regular updates on results until completion in early 2027, including articles in this journal and information forums. Once all field and lab work are complete, we will make a 'best practice guide to supporting Rubus pollinators' available to growers.

If you're a Rubus grower interested in letting us collect insects on your farm, please contact Julian Brown on julian.brown@unimelb.edu.au

Further reading

Coates, JM, Brown, J, and Cunningham, SA (2022) Wild bees nest in the stems of cultivated Rubus plants and act as effective crop pollinators. Agriculture, Ecosystems & Environment, Vol. 325

Hall, MA, Jones, J, Rocchetti, M, Wright, D, and Rader, R (2020) Bee visitation and fruit quality in berries under protected cropping vary along the length of polytunnels. Journal of Economic Entomology, Vol. 113

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