Managed and wild pollinators for crop production

Fact sheet 3

August 2020

Honey bees

Honey bees (*Apis* species) are not native to the Oceania region. European honey bees (*A. mellifera*) are widely recognised and often considered the quintessential bee[4], but they were introduced to the region in the 1800s as managed pollinators for food crops and for honey production[5]. *Apis cerana* is only recently arrived in some parts of the region, e.g. far north Australia, Solomon Islands, New Guinea, and is considered a biosecurity risk.

New Zealand has an estimated 880 000 managed honey bee hives, and the industry is growing rapidly[6]. Beekeeping is also an income source for many rural communities in Pacific nations[7]. While honey bees are efficient pollinators and contribute to reproduction of many crop and native plant species, they do pose some environmental risks. *Apis* species can spread pathogens, and they swarm regularly, forming feral colonies that may compete with native wildlife for food and nesting resources[2,5].

Exotic bees

In New Zealand and the island state of Tasmania (Australia), bumble bees — *Bombus terrestris* in Tasmania and *B. terrestris, B. hortorum, B. ruderatus* and *B. subterraneus* in New Zealand — were introduced for crop pollination[1]. These species are excellent buzz pollinators (Fact sheet 4). However, being exotic species, their introduction has the potential to disrupt native pollinator communities[2,3]. Other species introduced to New Zealand for their crop pollination potential include the Lucerne leaf-cutter bee (*Megachile rotundata*), the red clover mason bee (*Osmia caerulescens*) and the alkali bee (*Nomia melanderi*). It is unclear what impact these species may be having on wild pollinators.

The Oceania Pollinator Initiative aims to monitor pollinator decline, its causes, and impacts on pollination services in the Oceania region. The OPI also promotes the conservation, restoration, and sustainable use of pollinators in agriculture and ecosystems. More: www.besnet.world/oceania-pollinator-initiative-opi

Wild pollinators for crop production

Exotic managed species and wild pollinators all help to support food production across Oceania.

Australia has the largest bee fauna in Oceania, being home to more than 1600 formally identified species of bee (the number is estimated to be around 2000 species, but many are waiting in museums to be identified)[8]. New Zealand has ~40 bee species—seven of which are species that have been introduced, both accidentally and for pollination of food crops[9]. The Pacific island nations are considered to have a more recently evolved bee fauna, originating from Australia and parts of Asia[10] (see Fact sheet 2 for more detail on the bees of Oceania).

Some native bees are excellent candidates for pollination services in managed crop systems. Stingless bees (*Tetragonula* and *Austroplebeia* species) are both very efficient pollinators that also form large colonies and are widespread across northern Australia and New Guinea[11]. Their use in commercial crops has increased over the past few decades, and they are becoming a vital part of the pollination industry[12]. Other native bee species (e.g. *Amegilla, Megachile, Exoneura, Lasioglossum* and *Homalictus* species) have been less studied, but are likely efficient pollinators of some commercial crops.

Many of these native bees are commonly found pollinating vegetables, herbs and native plants across a range of environments, including farms and urban gardens.

Fly species are also good candidates for pollination in some crops and some species can be managed accordingly[13]. To date, other pollinator groups such as wasps, butterflies and beetles have not been extensively investigated for their management potential, and it is unlikely they could be managed in the same way bees are, but they do add to the list of our amazing diversity of wild pollinators in Oceania.

Pollinators can be managed actively (via domestication) or passively (via habitat creation) to enhance pollination services to both wild and crop flowers.

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