

STAGE 5: SUSTAINABLE BIOMES



A honeybee pollinates a flower (Creative Commons). Source: https://en.wikipedia.org/wiki/Honey_bee#/media/File:Pollinationn.jpg

POLLINATORS, BEES and FOOD

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POLLINATORS

Pollinators include bees, insects, birds, and other animals that move pollen from one flower to another, fertilising plants and allowing them to reproduce. Native pollinators are species native to a specific region. Although bees are the most common pollinators, other insects and animals, including wasps, butterflies, flies, beetles, bats, and birds are also important. The wind plays role in pollination while some plants are also self pollinating.

Bees, food and biomes

A large proportion of global food production and food security depends on the bees and insects which pollinate fruit, vegetable and pasture crops. Opportunities to increase the size and quality of crop harvests for up to 70 per cent of the world's main crops depends on continued honeybee pollination. In many biomes the biodiversity of plant species also depends on pollinators.

Approximately 30 percent of global food and fibre crops depend upon pollinators for reproduction. The fruits and seeds from these crops provide 15 to 30 percent of food and beverages consumed by people.

The role of bees in food production

Podcast: The power of pollinators Food and Agriculture Organization of the United Nations – <http://www.fao.org/news/podcast/tzh-06-the-powerof-pollinators-why-more-bees-means-better-food/en>



"In Australia, two-thirds of all horticultural and agricultural crops need honeybees for optimal pollination. Many fruits, such as apples, raspberries and peaches, are more productive, produce better, more attractive fruit and even store better and for longer when they are serviced by honeybees. Lucerne, which is an important crop for feeding livestock such as cattle, is also much more productive when sufficient numbers of honeybees are available to promote pollination. Almond blossoms rely completely on honeybees for pollination—so, no bees, no almonds. It has been estimated that the value of honeybee-reliant agriculture in Australia is AUD \$4–6 billion per year and rising"

From: AustralianAcademy of Science: Getting the buzz on the value of bees – <https://www.science.org.au/curious/everything-else/bees>



SUSTAINABLE BIOMES: POLLINATORS, BEES AND FOOD

Threats and challenges

Pollinator species are in decline along with global biodiversity. Since the 90's, the worldwide bee population has declined rapidly. There are many possible reasons for this decline including the usage of pesticides, habitat destruction and climate change. The challenge to future food production is maintaining honeybee numbers along with other pollinator species and halting the decline in global biodiversity.

World Bee Day

World Bee Day was an initiative launched in Slovenia on 2014 to increase global awareness about the need to protect bees due to the serious decline in bee populations worldwide. In December 2017, the UN, supported by all UN states, declared May 20th to be World Bee Day. As awareness increases opportunities to restore bee health and bee numbers also increases.

Opportunities

Australian universities and research organisations such as the CSIRO have researchers working on understanding bee behaviours, the threats to honeybee populations and ways to combat their decline. Thousands of honey bees have been fitted with tiny sensors as part of a world-first research program to monitor the insects' movements. Understanding bee behaviour while they travel through farm crops will help scientists trouble shoot immediate threats to their survival.

"CSIRO is also involved in bee research initiatives, leading the Global Initiative for Honeybee Health. This includes a project where 5000 bees have been fitted out with tiny sensors, then let loose into the environment. When the bees pass certain checkpoints, the sensors are detected, allowing the researchers to create a map of the bees' movements and better understand how they move through the landscape"

Australian Academy of Science – <https://www.science.org.au/curious/everything-else/bees>

Bee with a backpack... of the sensor variety



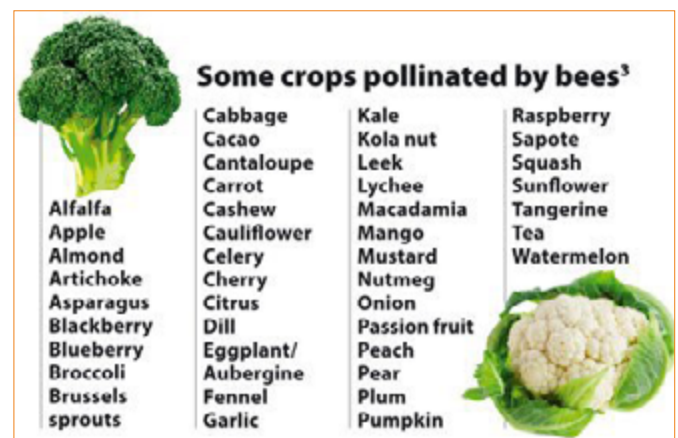
Source: Photo CSIRO – www.csiro.au/en/Research/BF/Areas/Protecting-Australias-agricultural-industries/Robot-technology/Swarm-sensing

Growing demand for bee services

Although the process of pollination occurs naturally, there is a growing demand in Australia for bee services where professional beekeepers help with the process as a business operation. These honey bee pollinators are estimated to add around \$6 billion a Australia's economy each year.

Native species such of bees and insects as well as wind assist in the pollination process and there are differences between the requirements of different crops. In 2018, 53 crops grown in Australia were found to depend on bees for pollination and the same study estimated that honey bees contributed \$14.2 billion to the Australian economy.

SOURCE A: Crops pollinated by bees



Source: <https://www.scienceabc.com/nature/bee-extinction-means-endhumanity.html>

Australia needs more service bees

In 2019, 240,000 honey bee hives were used for pollination by the almond industry. This was over half the number of managed honey bee hives in Australia at the time. Over a six week period beekeepers from as far away as Queensland and northern New South Wales relocate their their hives to the Murray River almond-growing region in Victoria where 68% of the Australia's almond trees are found. Pollination broker Trevor Monson says that this year, for the first time, the almond trees "almost ran short of bees to pollinate them."

Future demand for these bees is expected to increase to 300,000 hives. There is competing demand for bee services from avocado, macadamia and blueberries producers in northern NSW and Queensland in particular. Avocados and blueberries flower at the same time as almonds. There is growing pressure for Australia to have a pollinator policy to ensure future food security.

Drought and bushfires have impacted on Australia's capacity to increase the number of honeybee hives for agricultural use.

Aussie Agriculture future needs to be secure. Source: <https://www.nationalgeographic.com.au/australia/aussieagriculture-future-needs-to-bee-secure.aspx>