

Pollination underpins food security, biodiversity and ecosystem health. Approximately 88% of flowering plant species, and more than three quarters of the leading global food crops, benefit from pollination by animals for yield and/or quality.

*100 crop species provide 90% of food supplies for 146 countries; of these 100 crops, approximately 70% are pollinated by insects, largely unmanaged.*

Australia's fast-growing horticulture and broadacre cropping industries has created new pollination demands and challenges. Pollinators are estimated to contribute \$14.2 billion to the Australian economy.

Honey bees are the most widespread managed pollinator, but we need to understand more about how to maintain their health and to meet the growing need for crop pollination service delivery.

A diverse community of native insects also provide effective crop pollination services. We need to know what measures are required to support this biodiversity and their ongoing persistence in agricultural landscapes.

*Australia contains 10% of global bee diversity, about 2000 native species.*

Australian pollination services face significant threats from:

- pests and diseases (Varroa mite, viruses),
- loss of floral and nesting resources (bushfires, land clearing) and
- underdeveloped supply chain to meet expanding demand for managed hives.

This CRC will address key issues to secure and enhance pollination services for Australia and ensure future food security.

*The Pollination Security CRC proposes to address three research areas to build a reliable pollination service for agriculture:*

### Sustainable management of ecosystem services

**Pollinator health** — enhancing the survival of pollinators in agriculture landscapes beyond the crop bloom period

**Education** — best practice management for the integration of beneficial insect needs with current agricultural practices

### Pollinator supply-chain management

**Delivery** — Timely and cost-effective delivery of healthy pollinators to Australian agriculture

**Quality** — improving managed pollinator husbandry and nutrition to produce high quality stock

**Quality control** — quality control system to include pollination service delivery to crops

### Pollination efficacy

**Pollen delivery** — understanding and optimising pollen delivery for optimal fruit set and quality

**Pollinator management** — stocking rates and timing of hive supply

**Alternative pollination** — alternative pollination, mechanical/artificial pollination, native pollinators

# CRC Pollination: Proposed Draft Themes:

- 1. Sustainable management of ecosystem services
- 2. Supply chain: Managed Taxa
- 3. Pollination efficiency: increase yield and quality

# 1. Sustainable management of ecosystem services

## Diversity and conservation

Identity and conservation status; Management of threats to wild pollinators e.g. disease, habitat loss, fires, weeds, chemicals etc.

## Education, knowledge gaps

Identify tools and technologies needed : Mapping, Remote sensing, AI etc.  
Interactions and management with other taxa and ecosystem services e.g. pest control

## Insect and other Pollinators



## Best practice management

Community/Landscape/system approaches to management  
Development of guidelines and policies to support pollinators and other beneficial taxa

## Resource needs

Availability/quality of resource needs year round and in different habitats/land use types (larvae and adult)

## Pollinator health on farms

Mitigation measures to sustain/enhance populations i.e. habitat supplementation, provision of additional resources, floral strips, etc.

## 2. Supply chain: Managed taxa

**System  
development  
and optimisation**

Improving cost efficiencies in supply chains; Brokering for pollinator supply; improved access to managed pollination services; breeding and control of populations

**Education,  
knowledge gaps**

Identify tools and technologies needed  
Mapping, Remote sensing, AI etc.;  
upscaling to commercial

**Managed taxa**



**Best practice  
management**

**Quality control**

Quality control system to include pollination service delivery to crops; improving managed pollinator husbandry and nutrition to produce high quality stock

**Managed pollinator  
health**

e.g. Disease; Year-round food supply for honey bees outside of crop flowering;

# 3. Pollination efficiency: increase yield and quality

## Pollinator management

stocking rates; timing of hive supply; distribution within orchard

## Protected cropping

Identify conditions to optimise pollination

Increased fruit/seed set and quality



Best practice management

Technologies to improve pollination

Alternative/  
mechanical / artificial  
pollination

Crop cultural practices

Cultivar selection and placement; pollinator dependency; impact of plant (floral) traits on pollinator attractiveness and pollination outcomes