

Pollinators of South African Crops

Oilseed (sunflower and canola)

Where: Limpopo, Western Cape, Free State, North-West, and Mpumalanga highlands.
Pollinators: honeybees, non-*Apis* bees and other insects. SA is the world's 10th largest producer of sunflower seed for oil. Both sunflower and canola fields are used by beekeepers to capture swarming honeybees and for honey-flow.

Deciduous fruit (apples, pears, peaches, plums, apricots, cherries)

Where: mostly Western and Eastern Cape; also Free State, Mpumalanga, and Gauteng.
Pollinators: honeybees (commercial), non-*Apis* bees, and other insects.
 Apples can be misshapen if there is insufficient pollination, making adequate pollination very important for export quality. Deciduous fruit represents about 12% of SA's agricultural export earnings.

Rooibos seed

Where: Cedarberg, Western Cape.
Pollinators: pollen wasps, megachilid and carpenter bees; possibly honeybees.
 Over 9,000t of rooibos is produced per annum, of which ~40% is exported to key markets. Pollination is needed for seed production (tea is made from the stems and leaves).

Fynbos cut flowers (proteas, pincushions etc.)

Where: Cape Floristic Region from Clanwilliam on the West Coast to Port Elizabeth.
Pollinators: birds, bees, butterflies, beetles, and flies. SA produces half the world's wild-cut proteas, generating a revenue of ~R82 million per annum. Fynbos cut-flowers are sourced from the wild (wild-cut, requiring a pollinator) or grown from cuttings.

Squashes (pumpkins, marrows, patty-pans, butternut)

Where: Western and Northern Cape, Limpopo.
Pollinators: honeybees (commercial), and non-*Apis* bees and insects.
 Each flower has to be visited many times for complete pollination. Incomplete pollination results in small and misshapen fruits.

Melons and watermelons

Where: Western and Northern Cape, Limpopo.
Pollinators: honeybees (commercial), and other bees and insects.
 An increasingly important crop in SA, largely for export. In watermelons, pollen needs to be evenly deposited on the three stigmatic lobes to result in symmetrical fruit.



A. m. capensis



A. m. scutellata

About honeybees: Of the > 1 000 known species of bees in southern Africa, one is the honeybee, *Apis mellifera*. Two sub-species have been recognised: *A. m. scutellata* occurring in the summer rainfall areas and *A. m. capensis* occurring in the winter rainfall areas. These indigenous honeybees are the most important pollinators of many South African crops because they can be managed by humans on the scale needed to supply the commercial pollination service for our large-scale crops. Honeybees repeatedly visit different flowers of the same species and are highly mobile, which enables them to visit many plants in a large area. Honeybees are under threat from:

- Pests and diseases (such as varroa mite and American foulbrood).
- Pollution (including pesticides).
- Being over-worked (being moved long distances within short time-frames to provide the pollination service).
- A scarcity of forage resources—flowers with nectar (energy) and pollen (protein).

Think about what role you can play in helping our honeybees. We can all play a role in providing forage for honeybees by planting bee-friendly plants and encouraging our friends, family and government to do the same.

Nuts (macadamia, cashews, almonds, pistachio)

Where: Mpumalanga, Limpopo, Western and Northern Cape, and subtropical coastal areas of KwaZulu-Natal and Eastern Cape.
Pollinators: honeybees (commercial), other bees, wasps, flies, ants, and beetles.
 Nut trees are long-lived and often only start bearing in their 5th year. Cross-pollination is usually necessary, and commercial honeybees are frequently brought in.

Berries (raspberry, blackberry, blueberry, strawberry)

Where: Southern and Western Cape, Free State, and Gauteng.
Pollinators: honeybees (commercial), non-*Apis* bees and other insects.
 Most cultivars are self-incompatible, with insufficient cross-pollination resulting in imperfect fruits. As raspberries and blackberries are compound fruits made of a number of drupelets, berry weight and form depend on the number of stigmas receiving pollen.

Citrus (grapefruit, lemon, some orange cultivars, mandarin hybrids)

Where: Eastern and Western Cape, Mpumalanga, Limpopo.
Pollinators: honeybees and other insects.
 Pollination requirements vary across cultivars, with growers even trying to prevent pollination in some cultivars to limit the number of seeds/pips in the fruit. The citrus industry in SA is worth ~R3 billion, with > half of the produce exported.

Subtropical fruit (mango, litchi, avocado, granadilla, papaya)

Where: Mpumalanga, Limpopo, subtropical coastal areas of KwaZulu-Natal and the Eastern Cape.
Pollinators: honeybees (commercial), other bees, wasps, flies, and possibly moths.
 Nearly half of the annual avocado produce of 90 000t is exported. Honeybees, ants and flies have been found to be important for mango pollination.

Lucerne seed

Where: Oudtshoorn district of Eastern Cape.
Pollinators: Leafcutter and carpenter bees, honeybees.
 The Oudtshoorn district produces ~90% of the lucerne seed in SA. Beekeepers like the honey-flow from lucerne, but leafcutter and carpenter bees are better pollinators than honeybees.

Vegetable seed (onion, pumpkin, carrot, cauliflower, broccoli, Brussels sprouts, cabbage etc.)

Where: Klein Karoo (Western and Eastern Cape) and Northern Cape.
Pollinators: honeybees (commercial) and other insects.
 Vegetable seeds are usually produced separately to the vegetable itself. SA, particularly the Klein Karoo area, plays a big role in the global seed production market. Calliphorid flies and ladybirds contribute to onion pollination.

Pollination is the process by which pollen (male) is transferred from the ripe anther to the receptive stigma in a flower of the same species, thereby enabling fertilisation of the ovary (female) and the production of fruit and seeds (the reproduction of the plant). Only 10% of flowering plants are pollinated without animal assistance (i.e. self-pollinated, wind pollinated, or water pollinated). More commonly, the process of pollination requires a **pollinator** (most often an insect, but sometimes birds, bats, or rodents).

Did you know:

“You can thank a pollinator for one out of three bites of food you eat!” 60% of global food production volume comes from crops that do not depend on animal pollination (e.g. wheat, maize, and rice—our so-called ‘staple’ foods); 35% from crops that depend on pollinators; and 5% are unevaluated. But also remember: meat comes from animals that eat plants—some of which require pollination by pollinators!

Know your veg!

Pollination requirements of vegetables can be categorised according to what part of the plant is eaten:

- If the ‘vegetable’ is a ‘fruit’ then pollination is required both for the production of the vegetable AND for seed production, e.g. tomatoes, peppers, and pumpkins.
- If the ‘vegetable’ is in the form of leaves or shoots (e.g. lettuce, cabbage, and leeks) or is a ‘storage root’ (e.g. carrots and beetroot) then pollination is not required or desired for the production of the vegetable ONLY for seed production.
- If the ‘vegetable’ is a ‘storage stem’ then pollination is not required for EITHER the production of the vegetable or seed because seed is not required for propagation, e.g. potatoes and Jerusalem artichokes.



Contribute to pollinator research through iSpot! Not all flower visitors are pollinators and not all pollinate all species that they visit. Some are simply nectar thieves! Careful experiments and observation need to be undertaken to prove whether or not a flower visitor is in fact a pollinator. There could be vitally important pollinators of our crops that we need to know more about and protect. Anyone can make a contribution to this field by making careful, detailed observations supported by photographs. Use www.ispot.org.za to load your observations.