

POLLINATORS

YOUR
CROP'S BEST
FRIEND



POLLINATORS

Pollinators are crucial for agriculture.

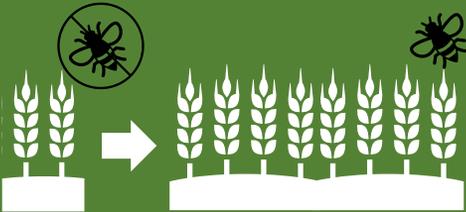


They maintain biodiversity.

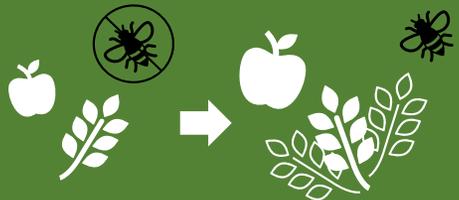


And they transfer pollen from flower to flower allowing the fertilisation of crops.

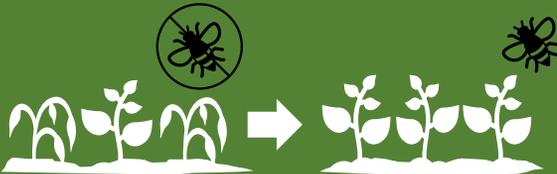
Benefits of pollinators:



Improved yield



Improved quality of crops
and fruit



Improved stability of crop
production

Threats to pollinators:



Loss of
wildflowers



Killing of bees mistaken as
pests



Loss of sites for nesting
and foraging



Exposure to
pesticides



Habitat destruction

Some practices to protect pollinators:



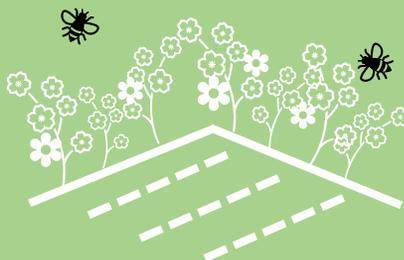
Avoid broad-spectrum insecticides



If pesticides are necessary, apply approved organic pesticides that are not toxic to pollinators



Plant trees in and around fields



Wildflower borders provide food for the pollinators

POLLINATORS

Hoverfly (Syrphidae family)



©Tlou Masehela



Actual size

Characteristics:

- Black and yellow striped abdomen
- Are able to hover in the air above flowers
- Appearance mimics honeybees

Differences between the hoverfly and honeybee include: hoverflies have 1 pair of wings, bees have 2. Hoverflies have shorter antennae than bees. The eyes of hoverflies cover most of their head, and they have no biting mouthparts.

Hoverflies are important pollinators of many crops. These include:

- Avocado
- Apple
- Beet
- Carrots
- Pear
- Raspberry
- Strawberry
- Watermelon

How to attract the species:

Hoverflies feed on nectar and pollen and are attracted to flowers, in particular small flowers, due to having small mouthparts, and brightly coloured yellow and orange flowers. Maintaining wildflower borders would therefore be beneficial. Many plants in the rose family are also good at attracting hoverflies. Reducing broad spectrum insecticide use will also help to conserve this pollinator.

Not only are hoverflies important pollinators, but their larvae are also natural enemies of aphids, mealybug and whiteflies meaning they consume and control pest numbers. This will reduce the need for artificial pesticides that can cause damage to other organisms (including pollinators and humans) and soil and water quality, all of which impact crop yields.

POLLINATORS

Small carpenter bee (*Macrogalea candida*)



©Bernhard Jacobi

Characteristics:

- Hairy, medium-sized, long-tonged bees
- Solitary bees
- Nest in old wood or tree branches
- Female bees can sting



Actual size

Carpenter bees pollinate a vast range of crops including:

- | | | |
|--------------|-----------|-----------|
| - Black bean | - Cashew | - Pear |
| - Broad bean | - Cotton | - Peach |
| - Cantaloupe | - Cow pea | - Pumpkin |

How to attract the species:

Small carpenter bees nest in old wood, so leaving old reed stems and old flowering spikes of aloe for example would provide a suitable habitat for the bees.

Other species to attract carpenter bees include: pink wild pear, the common wild pear, East African Cordia (*Cordia africana*) and the Nile Tulip (*Markhamia lutea*)

POLLINATORS

Stingless bee (*Meliponula* species)



©Nicolas Vereecken

Characteristics:

- Black with orange/brown striped abdomen
- Social bees with the colonies consisting of worker bees and queen bees
- Do not sting (but can bite if disrupted)

Stingless bees can be distinguished from honeybees as they are much smaller in size.



Actual size

Important pollinators of:

- | | | |
|-----------------|-----------|--------------|
| - Avocado | - Coconut | - Macadamia |
| - Cashew | - Coffee | - Mango |
| - Chilli pepper | - Guava | - Strawberry |
| | | - Vanilla |

How to attract the species:

Like the hoverfly, stingless bees feed on nectar, relying solely on flowers for the nectar and pollen. Therefore, with seasonal crops, like mango, you should maintain patches of natural habitat and wildflowers for the pollinators to visit when the crops are not in flower.

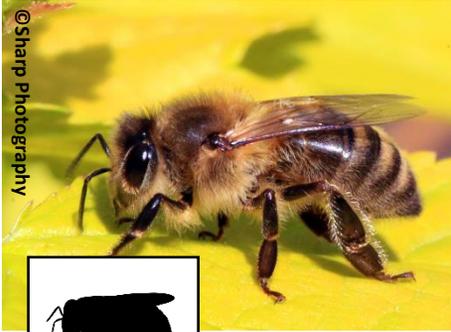
As stingless bees are not as dangerous as honeybees they can also be kept on the farm in hives.

Important!

Be careful if harvesting the honey from these bees as breaking open the nest results in the entire colony being killed.

POLLINATORS

Honey Bees (*Apis mellifera*)



Actual size

Around 15 mm long and have a brown and orange/yellow striped body.

Are social bees that feed on nectar and pollen to produce honey.

Attracted by many crops including trees such as wild pear species (*Dombeya*), shrubs such as blackthorn and wildflowers such as *Clematis* spp.

Pollinate crops including apple, avocado, cabbage, coffee and okra.

7-12mm and are dark coloured with narrow lighter bands on the abdomen.

Sweat bees are solitary bees and nest in the ground.

Efficient pollinators of coffee, cow pea, watermelon and apple.

Can be attracted by flowers such as *Asteraceae* e.g. daisies and sunflowers.

Sweat Bees (*Lipotriches*)



Actual size

Carpenter ants (*Camponotus*)



Actual size

4-13mm. Most are black, but some may have a reddish colouring.

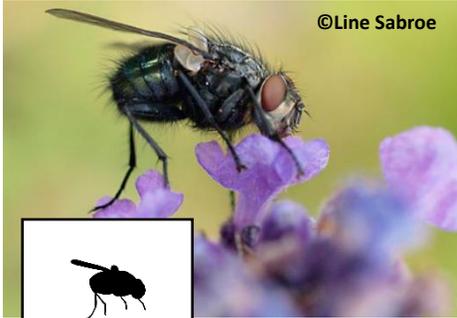
Can be found building nests in dead, damp wood.

These ants are predators as well as pollinators, feeding on the pest African citrus psyllid, which causes stunted growth of crops.

Are useful for the dispersal of small seeds as they often carry these to their nests.

POLLINATORS

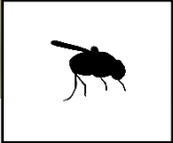
Blowflies (*Chrysoma albiceps*)



6-9 mm in length, and thorax and abdomen are a metallic blue/green.

These flies play a major role in the pollination of fruit orchards, including mangoes.

Blowflies are attracted to carrion (the decaying flesh of dead animals), being able to smell this from around 10 km away.



Actual size

Leaf cutter bees (*Megachile* sp.)

These bees can range from 5-24 mm in size and are stocky and robust with large eyes.

Often grey/brown, and can be boldly marked with orange, white, red or yellow.

They pollinate many crops including black bean, chilli pepper and pigeon pea.

Can be attracted by trees such as *Millettia* or wildflowers like wild cow pea (*Vigna* spp.) and the Pondo poison-pea (*Tephrosia* spp.).



Actual size

There are also many beetles that act as pollinators for a range of crops and plants

These include:

Long-horned beetles



Ant-like flower beetles



Important pollinators of crops including okra, oil palm and nuts such as macadamia

AGRISYS TANZANIA

PROJECT INFORMATION

AGRISYS Tanzania is a project to research biological and human well-being benefits that can be provided by agroforestry in tropical landscapes.

They work to:

1. Identify the key benefits of agroforestry
2. Identify the agricultural potential of agroforestry landscapes
3. Study sustainable agriculture practices and their link to human well-being



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