

HOW TO MAKE A BEE HOTEL



AUSTRALIAN NATIONAL
BOTANIC GARDENS

Alive with learning

Most native bees are solitary, so each female builds her own nest. We can help them by building a 'bee hotel'. Visit the bee hotel at the Australian National Botanic Gardens or use these ideas to make your own!

Native bee expert, Remko Leijds, checks out who's nesting in our bee hotel
© Bush Blitz



Solitary native bees make their nests by burrowing into the soil, rotting wood or pithy stems. A native bee hotel provides hollows for native bees to nest in. The female puts a supply of pollen and nectar in the first 'brood cell' before laying a single egg and sealing up that cell. She repeats the process, establishing multiple brood cells, then closes off the entrance to the burrow. The eggs hatch into larvae which eat their food and moult into pupae. In time, adult bees emerge from the nest.

How to make a bee hotel

Bee Block

Step 1: Find a piece of untreated dry wood at least 13 cm deep (the denser the wood the better).

Step 2: Drill holes of 3–8 mm in diameter across the grain. Drill to a depth of 10–15 mm but not right through the wood. A variety of diameters will accommodate the needs of different bee species.

Step 3: Attach a roof to provide protection from the sun and rain or place it in a sheltered position. Outside surfaces may be painted or stained, but don't use wood preservatives.

Step 4: Place or hang the bee block so bees have open flight access. Make sure it's fixed firmly so it doesn't sway or swing.

PVC Palace

Step 1: Take a piece of white PVC pipe approx. 60 mm wide x 200 mm long.

Step 2: Cover one end of the pipe with sticky tape.

Step 3: Fill the open end of the pipe with paper straws (use uncoated paper straws as plastic or wax-coated straws get too hot and the larvae will die).

Step 4: Securely fix the pipe to a fence post, or other solid surface, in a protected location.



Mudbrick Mansion

Step 1: Make small block casings using 10 cm stretches of 90 mm square PVC stormwater pipe.

Step 2: Mix a clay soil (without stones or coarse sand grains) with water to make a thick paste. Fill the casings with clay and leave to partly dry.

Step 3: Before clay is completely dry, use a sharp, round device to make holes approx. 6–7 mm in diameter and 6–10 cm long.

Step 4: Leave to dry completely and remove blocks from casings. Place the blocks into existing stone walls.



Bee Bundles

The easiest and cheapest bee hotel is a bee bundle.

Step 1: Using bamboo, paper straws or twigs with pithy stems, make a bundle as big as you like and secure it with string or tape.

Step 2: Securely fix the bundle to a solid surface in a sheltered position.



Once you've made your bee hotel, relax and wait for the bees!



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Maintaining your bee hotel

There is no need to try to attract bees to your hotel. If it is there, and they need it, they will come. However, here are some hints for a successful bee hotel:

- Secure the hotel so it is horizontal on a branch, or other similar place, that is firm and out of the way but where you can easily see the holes. Make sure the hotel doesn't swing around or the bees will find it difficult to fly in and out.
- Other creatures, such as spiders, might also like your hotel. If something you don't want moves into your hotel, try to remove it safely.
- As a number of eggs may be laid in each cell, more than one larva could emerge as a bee so don't touch cells until you are sure they are empty. After all bees have emerged you can clean out your hotel for the next season.

What type of bee is that?

Once the bees have finished nesting you will see a small cap at the end of the hollow.

Different types of solitary native bees can be recognised by the cell caps they make. They may be made of resin, pieces of leaf, mud and even small rocks.

Here are some examples:

Leafcutter bee

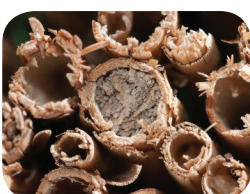


Resin bee

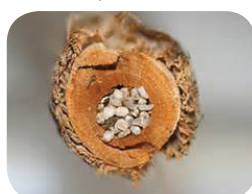


© Remko Leijts

Mason bee



Carpenter bee



A bee friendly garden

You can also make your garden more bee friendly:

- Leave some areas free of mulch and weed matting as some bees, such as blue banded bees, make their nests in the soil.
- Plant buzz-pollinated plants like sennas, Fringe Lily, flax lilies, Chocolate Lily, Trailing Guinea Flower, velvet bushes and tomatoes.
- Plant nectar-rich plants like fan flowers, Emu Bush, Christmas Bush and Native Juniper.
- Plan your garden to include a diversity of native species that will provide flowers all year round as different bees forage at different times of the year.
- When pruning plants with pithy stems, leave at least 10 cm above the node for the bees to burrow into.
- Leave dead wood for bees to burrow into.



Chocolate Lily



Belalla Gold



Aussie Salute



Native Juniper

For more information

Download our "Native bees" fact sheet at bushblitz.org.au/resources or visit:

- actforbees.org/resources/australian-native-bees
- aussiebee.com.au
- australianmuseum.net.au/bees-suborder-apocrita
- beeaware.org.au/pollination/native-bees

NATIVE BEES



AUSTRALIAN NATIONAL
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There are over 1,600 species of native bees in Australia and they are important pollinators for Australia's unique flora.

The buzz about bees!

- The bees we usually notice in our gardens are not native bees – they are introduced honey bees, *Apis mellifera*, which were imported from Europe in 1822 for honey production.
- Unlike honey bees, nearly all Australian native bees are solitary. There are only a few social stingless bees that produce honey.
- Native bees range in size from 2 to 24 mm long. They come in a range of colours – red, yellow, orange, green, blue, black and white. While some have dense fur covering their bodies, others are smooth, hairless and shiny.
- Apart from the stingless bees, all female native bees have a sting but they are not aggressive and many cannot even get through your skin.
- 'New' species of native bees are still being discovered. Since 2010, the Bush Blitz species discovery program has found over 100 native bee species that are new to science.

The life cycle of bees

All bees go through four stages in their life cycle - egg > larva > pupa > adult.

Solitary native bees make their nests by burrowing into soil, rotting wood or pithy stems. Each female nests alone. She stocks the cell with pollen and nectar and lays a single egg before sealing it. She makes multiple brood cells in one nest before closing off the entrance to protect it from intruders, such as ants and parasitic wasps.



Vital for agriculture

Like honey bees, native bees visit flowers to get nectar and pollen. While doing this they transfer pollen to other flowers, thus pollinating plants.

Native bees play a particularly important role in pollinating native plants and horticultural crops.

Most flowers release their pollen passively when a bee just lands on them, but many native flowers and some crops only release their pollen when a flower is vibrated rapidly – this is called “**buzz pollination**”.

Honey bees cannot buzz pollinate, so plants that require buzz pollination depend on native bees for reproduction.

Blue banded bees

Blue banded bees are Australian native buzz pollinators.

A blue banded bee recorded on the Hiltaba Station
Bush Blitz © Bush Blitz



They are common in the Australian National Botanic Gardens. Look for them on blue and yellow flowers. Often you will hear them buzzing before you see them!

Tomato plants are buzz pollinated. Australian tomato growers using greenhouses have to use an “electric bee” vibrator to pollinate flowers, a very time consuming task. Researchers from the University of Adelaide have found that tomato plants pollinated by blue banded bees produce larger and tastier tomatoes!

Blue banded bees make their nesting burrows in the ground, making them very efficient pollinators of crops such as canola. Honey bees only travel a certain distance from their hive to gather nectar which can result in only the part of a field close to a bee hive being well pollinated. In contrast, the blue banded bees will develop burrows in the ground throughout a field, pollinating the whole field.



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Carpenter bees

Carpenter bees are so named because they carve nest burrows in soft timber or pithy stems using their strong mandibles (jaws).

The largest native bee is the Great Carpenter Bee of the tropical north and northern NSW, which measures up to 24 mm long.

Great Carpenter Bee
image sourced aussiebee.com.au



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Stingless bees

- There are at least 11 species of stingless bees. They are primitive social bees that live in colonies with a queen, drones and thousands of workers.
- Stingless bees are not found in the ACT and it is only in warm areas of Australia, such as Queensland and northern NSW, that they can produce more honey than they need for their own survival.
- Nests are mainly found in hollow trees. These bees were prized by Indigenous people as the honey was an important food source and medical remedy, plus nest resins were used as glue for making tools and weapons.



A native stingless bee (left) compared to a honey bee
image sourced aussiebee.com.au



This teddy bear bee was recorded on the Lake Torrens Bush Blitz
© Earthwatch

Teddy bear bees

Most species of these rotund, furry brown bees are 7 to 15 mm long. They build shallow nest burrows in soft soil and sometimes nest under houses. Each female builds her own nest burrow but many bees may nest together in one location, so they are semi-social.

Leafcutter bees

There are about 27 species of leafcutter bees known from across Australia. They range in size from 6 to 15 mm. Most are black with white or orange-gold stripes of hair on their abdomen.

Females cut circular holes in soft leaves. They use the circular leaves to line the nests and close off each cell. When the nest is full they use more leaf circles to plug the hole.



© 2010 Erica Siegel

image sourced aussiebee.com.au

Get into the buzz

There are many ways you can support our native bees, such as building a bee hotel for your garden and growing a variety of plants (native and food plants) to promote year round flowering.

Visit the bee hotel at the Gardens and, for information on how to build your own bee hotel, download our "How to make a bee hotel" fact sheet at bushblitz.org.au/resources.

There are a number of websites that provide information on native bees including:

- actforbees.org/resources/australian-native-bees
- aussiebee.com.au
- australianmuseum.net.au/bees-suborder-apocrita
- beeaware.org.au/pollination/native-bees