

## Orchard Mason Bee

### Overview

The orchard mason bee, *Osmia lignaria*, is an effective early pollinator native to the Western US and Canada. It emerges in the spring, before honeybees. As a pollinator, it is far more efficient than the honeybee by transferring more pollen and visiting more types and numbers of flowers.

The male mason bee does not sting. A female is considered non-aggressive, stings only when handled 'roughly,' or when trapped under clothing. Mason bees are solitary. They do not produce honey; adults feed on nectar and collect pollen and nectar to feed their young. In contrast, wasps also feed on nectar but must hunt for meat to feed their carnivorous larvae.

A mason bee looks like a small black fly, but flies only have one pair of wings and bees have two pairs. Mason bees are slightly smaller than honeybees. They fly only after air temperature warms up to about 55°F.

### Life Cycle

Mason bees are active in your garden for about one month beginning early spring. During the cold weather months, a fully formed adult bee stays in its cocoon in the nest. When temperatures rise to 50°F for a couple of days in early spring, the adult bee chews through the cocoon and emerges. Emergence continues for up to two weeks.

When eggs were laid the previous spring, the male eggs were placed near the entrance of the nest while females were placed in the back. Thus, males emerge first. They wait for females to emerge in order to mate. (This is the sole purpose for male mason bees). Females begin nesting about 3 to 4 days after mating, preferring existing holes for their nests. The female will choose a hole slightly larger than her body, usually about ¼ to 3/8 inch in diameter. She will place a mud plug at the bottom of the hole and begin to bring in nectar and pollen.

When she has stored enough food for the young, she will lay an egg on the pollen and seal the cell with a thin mud partition. She then repeats the process until the entire length of the tunnel is used. The female stores the semen from mating and only uses it to fertilize the egg if she wants to get a female offspring. An unfertilized egg will become male, and typically 2/3 of cocoons will be males.

A few days after eggs are laid, larvae hatch. Larvae feed on the pollen and nectar stored in the nest. After 10 days, the larvae spin a cocoon and pupate within the cell. Near the end of summer, the bee transforms to the adult stage called an *imago* but remains in the cocoon throughout the winter.

Female mason bees live about 1 month and lay 1 to 2 eggs a day. Males live shorter lives; their only purpose is to impregnate the female.

## Houses

The nesting holes for mason bees should be ¼ to 3/8 inch in diameter and at least 3 inches, preferably 6 inches, deep. The hole should be open only on the entry end. Mason bees prefer wood (not pressure-treated or cedar) in which to nest but will use other materials.

You can make mason bee houses by drilling holes into a block of wood. Place the nest in a dry, protected site preferably with east or southeast exposure. Insert a paper straw liner into each hole to make retrieval of the cocoons easier if you 'wash' your bees in the fall. Washing rids them of most mites and diseases.

## Parasites, Predators & Pathogens

Several parasites, predators and pathogens can injure or kill mason bees. Small Chalcid wasps pierce mason bee cocoons and lay eggs in them. These wasps emerge later than the mason bee, so you can decrease the risk by taking down mason bee nests once they have filled the opening. The Krombein Mite, *Chaetodactylus krombeini*, reproduces within a mason bee cell and feeds on the pollen stored for the young bee larva. By the end of summer, the cell is packed with empty pollen grains and thousands of mites.

You can rid mites by cleaning the cocoons between October and December. Adults are fully developed at this time and can withstand this process. Be sure to use water no warmer than 50°F so as not to 'wake up' the bees. First, soak cocoons in cool water to soften and remove mud. Using a sieve, gently roll and move cocoons through the water. Discard debris. Then soak them, no more than 10 minutes, in cool water with a mixture of .05 percent bleach (1 tablespoon bleach per 1 gallon water) to kill adhering bacteria, fungi and most mites. Rinse well under cool water to remove all traces of bleach. Dry on a clean paper towel for 1 hour. Sort and discard damaged, diseased or parasitized cocoons. Put clean, air-dried cocoons in a small container with air holes and store in the refrigerator.

## References

*The Orchard Mason Bee*, Brian Griffin, 1999, Knox Cellar Publishing.

*Pollination with Mason Bees*, Dr. Margriet Dogterom, 2002, Beediverse Books

*All About Mason Bees*, DVD, Dr. Margriet Dogterom, 2007, Beediverse

*How to Manage the Blue Orchard Bee*, Jordi Bosch and William Kemp, 2001, Sustainable Agriculture Network

*Orchard Mason Bee*, Washington State University publication, PLS -112

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