



Garden Notes

GN 102

THE ORCHARD BEE NESTING HOUSE

THE ORCHARD MASON BEE

There are more than 3500 species of native North American solitary bees. The orchard mason bee (*Osmia lignaria*) is one of these native bees. They are very good pollinators for early blooming fruit trees and berries. Unlike hive-dwelling social bees, such as the honeybee, mason bees are solitary. They are non-aggressive, do not have a queen or a hive to protect, do not attack to defend their nest, and do not stir up each other in alarm. Each female mason bee builds her own nest, lays her eggs, seals in the eggs and pollen, and dies. Even though mason bees are solitary, the females are gregarious and like to build their nests near each other. These bees have a blue-black metallic shine (they are sometimes called blue orchard bees), are 3/8 to 5/8 inches long, and, because they are smaller than honey bees, are sometimes mistaken for flies.

ORCHARD MASON BEE LIFE CYCLE

Early in the spring when the weather warms, the hibernating bees emerge from their nesting holes. Male bees emerge first and are active for a few days before the females appear. The male bee lives for a few weeks, just enough time to mate with the newly emerged female. She immediately begins her life's work—making more orchard mason bees. The female chooses a nesting hole slightly larger than her body, about 5/16 inch. She gathers about 15 to 20 loads of pollen and nectar from the spring blossoms and brings it to the hole. When the proper amount of food is gathered and placed in the back of the hole, the female backs in and deposits one egg into the collected food. The individual egg chamber is sealed off with a plug of mud (hence the "mason" part of orchard mason bee), and the process is repeated again and again until the entire hole is filled with egg chambers. The female bee deposits about two male eggs for each female one, placing the female eggs at the back of the nesting hole. Finally, an extra thick masonry plug seals the hole opening, and the bee flies off looking for a new nesting hole. This food gathering, egg laying and masonry work goes on until about early June, when the female bees all die.

Inside the nesting chamber, the egg hatches into a larva in a few days. For the next two weeks, the larva consumes the food its mother left for it. The larva then spins a cocoon and transforms into a pupa. By the end of summer, it will have grown into an adult bee. It will hibernate within the sealed chamber through the winter, and chew through the mud to emerge in the spring, beginning the cycle again. There is only one generation of orchard mason bees per year.



Male Female
Osmia lignaria

Approximate size

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THE ORCHARD BEE NESTING HOUSE

Orchard mason bees do not create their own nesting holes, but rely on others to create nesting sites for them. They will use pre-existing holes, such as old beetle holes in trees, spaces between shingles on a house, old nail holes, or nesting houses such as this one. Hang the house on an east or south wall, facing the morning sun. Insert the mounting screw into the wall, leaving the screw head out about ¼ inch from the wall. Place the hole in the back of the house over the screw head and pull downward gently. The house should fit snugly against the wall. Height of the house is not critical, but it is best hung under an eave or overhang to protect it from direct rain. Attach the house to a solid wall; to minimize the effects of air movement, do not hang it from an overhead hook, on a post, or in a tree. Place it near your fruit trees, but no farther than 300 feet away. Hang it so you can watch the bees at work. Note that other solitary bees may also nest in this bee house.

Orchard mason bees' survival needs are few. The female bee needs proper nesting holes (optimum size is 5/16 inch diameter, 6 inches long), pollen and nectar on which to feed herself and her young, and mud. If there are no nearby sources of damp earth, scoop out a small, shallow depression in bare earth near the nest and fill it with water. Don't let it dry out completely before mid-June. When the female bees begin to nest, do not move the nesting house. If the female has laid eggs and you move it too soon, you risk killing the offspring—if larva fall off the food source, they can starve. In addition, the female bee marks her nesting site, and will become disoriented if it is moved while she is out gathering food. If you feel your nesting house is not in the right place, provide another.

The orchard mason bee is prey for numerous predators at various stages in its life cycle. Birds can attack nesting sites, but a cover of ½ inch hardware cloth will discourage them. Several parasitic wasps and mites affect mason bees, in addition to diseases and fungal infections. To minimize these problems and help maintain a healthy population of mason bees, clean the house each year. This can be done either during the fall or in the spring. For fall cleaning, after September when the adult bees are fully formed, take apart the bee nesting house. To do this,

- unscrew the two nuts on the bottom with pliers or a small wrench
- gently pry apart the individual trays
- carefully remove cocoons from the nesting holes

Both cocoons and nesting holes can then be examined and cleaned. Store the cocoons over the winter, until the bees are ready to emerge in the spring. For a complete discussion about removing, cleaning and storing cocoons, read *Pollination With Mason Bees* by Margriet Dogterom, PhD.

To re-assemble the house,

- arrange trays in numeric order (numbers are on back) so all holes line up properly
- gently slip the bolts through the holes in the trays
- be sure the correct tray is on the bottom
- replace and tighten the nuts

Alternatively, clean the nesting house in the spring. Because bees will usually nest in clean holes rather than reuse previously occupied ones, you can help them move to a new site you provide. When the bees begin to emerge in spring, place the house upright in a cardboard box and tape it shut so no light comes inside. Poke one hole near the bottom of the box, about 3/8 inch in diameter. Newly emerging bees will go toward the source of the light and leave the box. In a few weeks when it seems the bees have all emerged, take apart the nesting house as described above, clean it, and store it for the next generation.

Additional Reading: Dogterom, Margriet, *Pollination With Mason Bees*, Beediverse Books, 2002
Griffin, Brian L., *The Orchard Mason Bee*, Knox Cellars Publishing Co., 1999