

## Orchard Mason Bee

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The orchard mason bee (*Osmia lignaria*) is a gentle beneficial insect that has potential as a pollinator of apples, cherries, and other tree fruits. It is found throughout Washington, particularly in wooded areas but often around homes in urban areas.

Homeowners sometimes become concern-ed when they see the bee entering cavities under shake siding or investigating nail holes or other cavities in wood during April, May, and June. These are not destructive insects, since they do not excavate holes in the wood. Therefore, no controls are suggested, although holes may be filled with caulking to prevent bee nesting.

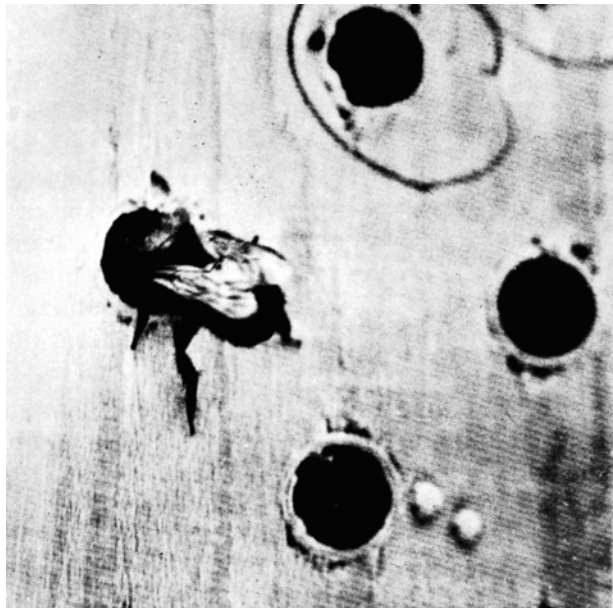
The orchard mason bee (Fig. 1) is slightly smaller than a honey bee and a shiny dark blue in color. Males are smaller than females and have longer antennae and an additional tuft of light colored hairs on the face. Females have hairs on the underside of the abdomen adapted for carrying pollen.

### Nesting Habits

The female uses existing holes in wood for a nest. She chooses holes slightly larger than her body, usually 1/4 to 3/8 inch in diameter. The bee first places a mud plug at the bottom of the hole, then brings in 15 or 20 loads of nectar and pollen which she collects from spring flowers, including apples and other fruits. As one watches the bee closely as she enters the nest, the pollen on the abdominal underside may be observed.

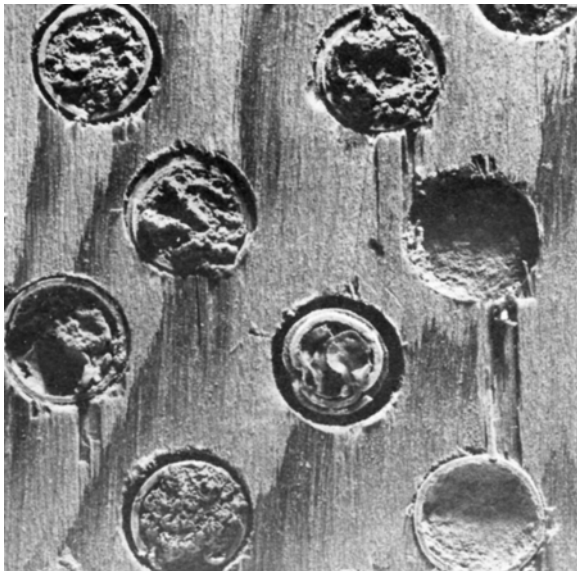


**Fig. 1. An orchard mason bee.**  
By A.L. Antonelli.



**Fig. 2 Orchard mason bee putting entrance plug in her nest.**

When the female has provided a sufficient supply of food for the larva, she lays an egg and then seals the cell with a thin mud plug. She then provisions another cell, and continues in this fashion until the hole is nearly full. Finally the bee plasters a thick mud plug at the entrance (Fig. 2). Some wasps also build nests in such holes but their nests can be distinguished from the orchard mason bee by characteristics of the plug. The plug of the mason bee is always rough while the wasp makes a smooth plug (Fig. 3).

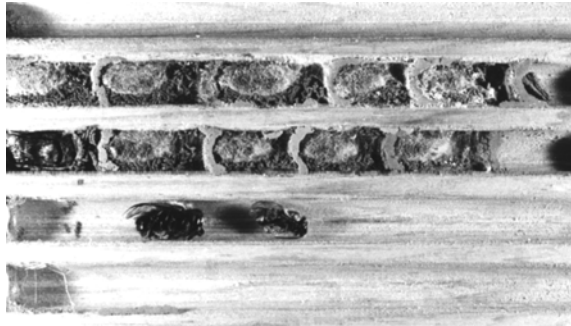


**Fig. 3. Entrance plugs. Upper row—orchard mason bee. Third row, right—alfalfa leafcutting bee. Second row, right, and bottom row, right—potter wasp.**

The female orchard mason bee lives for about a month and can produce one or two eggs each day. The larva hatches from the egg after a few days and begins to eat its provisions. When the pollen-nectar mass is completely eaten in 10 days, the larva spins a cocoon (Fig. 4) and pupates within the cell.

Near the end of the summer the bee transforms to the adult stage but remains in the cocoon throughout the

winter. In the spring when the weather has warmed up sufficiently, the males begin to emerge by chewing their way out of the cocoons and through the mud plugs. The females, which are almost always in the inner cells of the tunnel, emerge a few days later. One or two weeks may be required for all the bees to emerge during cool weather.



**Fig. 4. Section through nest showing cocoons and mud partitions. Nest entrance is at the right. Male and female (left) bees are shown for size comparison.**

Females mate soon after emerging then begin nesting in 3 to 4 days. The bees forage on a number of different flowers. In wooded areas, they seem to prefer ballhead waterleaf. In urban areas, dandelion and Oregon grape are commonly visited in addition to cherries and apples.

### **This Bee Is Gentle**

The orchard mason bee is non-aggressive and will sting only if handled roughly or if it should get trapped under clothing. It is less objectionable than the honey bee as a pollinator in urban areas and should be encouraged. Efforts are being made experimentally to develop large populations of these bees to use as a supplement to honey bees for fruit pollination, much as the alfalfa leafcutting bee was developed for alfalfa seed pollination.

## Collecting Orchard Mason Bees

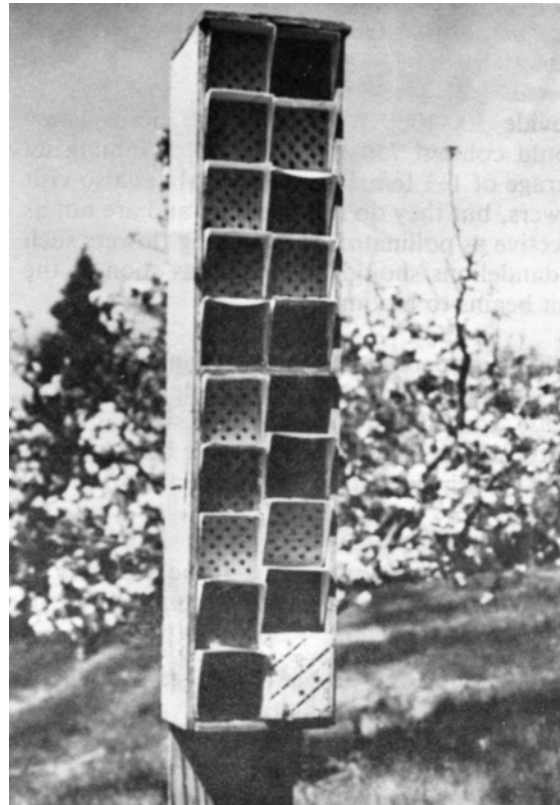
If you wish to develop populations for pollinating a home or commercial orchard, you can set out trap nests to collect the bees. Trap nests can be made by drilling holes 1/4 to 3/8 inches in diameter in a 4X4 post. The holes should be cut lengthwise in pine or fir 3 to 6 inches deep. Alfalfa leafcutting bee boards with hole diameters of at least 1/4 inch can also be used.

Attach the boards to a house or other structure where you have seen the bees. Some protection from rain is desirable. You may also place boards on dead trees or posts in wooded areas near streams where there is a good supply of mud for nest construction and wild flowers on which to forage.

Position boards where they will receive morning sunlight. Put the nests up in March before the bees begin nesting and remove them in early to mid-summer when nesting is completed. If the boards are stored outdoors over winter (under cover to protect them from rain and snow) the bees will emerge in April. They should forage for pollen during the period of apple bloom and afterwards, if sufficient other flowers are available to them.

## Using the Bee in Orchards

If you wish to develop large populations for orchard pollination, you should store the nests under refrigeration at 35 to 40° F. This will permit control of emergence time and reduce predation and parasitism by insect enemies of the bees. Do not place the nests in storage until September or October to assure complete development of the adults.



**Fig. 5. Bee shelter in an orchard. The nests are made of cardboard tubes inserted into a plywood face in a milk carton. Holes drilled in wood may also be used.**

The following spring, place the boards in the orchards in plywood shelters (Fig. 5) facing east to catch the morning sun. To hasten emergence, incubate the boards at room temperature for 24 hours before placing the bees in the orchard. The boards and some new nesting material should be in place a few days before apples begin to bloom, or earlier if other fruit bloom such as cherries, is available.

Provide 500-1000 filled holes per acre. These should contain 750-1000 females, assuming an average of 1 1/2 females per hole. Males also visit flowers, but they do not live long and are not as effective as the females as

pollinators. Competing flowers such as dandelions should be mowed as soon as the fruit begins to bloom.

If no natural mud source is available near the nesting shelters, dig a shallow hole, line it with plastic, and fill it with moist soil. A simple drip irrigator can be made from a plastic bucket and a piece of drip irrigation tubing to keep the soil moist.

Developing large populations of the bees may be a slow process under orchard conditions; the short duration of bloom does not allow the bees to accomplish maximum reproduction. The orchard mason bee also has a tendency to fly away rather than using or reusing

nests in the near vicinity. However, relatively large populations have been developed in 2 or 3 years in urban situations.

### **Nature Study**

In addition to their value as pollinators, orchard mason bees are fascinating insects for nature study. Observation nests can be fashioned from transparent plastic or glass tubes placed in a box that can be opened for observation. A film, *The Orchard Mason Bee*, depicting the life history and management of the orchard mason bee is available from the Instructional Media Center, Holland Library, Washington State University, Pullman, WA 99164.

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