

Raising Orchard Mason Bees

There is a hardworking bee called the "**Mason Bee**" that many of you may wish to 'raise'.

You do not need to maintain a hive, nor do you need to rely on the commercial or retail mason bee homes. Blocks of pine (**no cedar**) with holes drilled in will do fine.

There is a wealth of information on the web about raising your own Mason bees. Here's an article from the University of Arizona - you may remember that the Southern US is being invaded by Africanized bees, and these folks believe the Mason bee may be part of the solution.

University of Arizona - Information Sheet 29 Raising Orchard Mason Bees

If you have developed an interest in bees, but aren't ready or able to keep honey bees, you might want to try encouraging local native bees as pollinators. Orchard mason bees (*Osmia lignaria* and related species) are native bees that are becoming popular with gardeners and farmers. Mason bees are slightly smaller than honey bees, and are shiny dark blue, almost black in color. These gentle bees are not likely to sting, although they will defend themselves if stepped on or trapped under clothing.

Orchard mason bees occur naturally in Arizona and throughout the United States. In nature they nest in beetle galleries in wood. Unlike carpenter bees, mason bees are never destructive to homes or other wooden structures because they do not excavate nest holes themselves. But this means that nest holes may be in short supply. To encourage mason bees you can provide a bee house, the insect equivalent of a bird house. You can buy bee houses or purchase kits from Knox Cellars, 25724 NE 10th Street, Sammamish, WA 98074, Fax 425-898-8070 or Phone 206-849-5065, or visit their website at <http://www.knoxcellars.com/>.

To build your own bee house, drill a series of holes 3/8 inches in diameter (smaller diameter holes will be used by leafcutter bees) three to six inches deep in pine or fir 4X4's or glued-up boards. Space the holes about 3/4 inch apart, the number and design are up to you. Paint and decorate as you wish. Mount the house firmly to fixed surface where it will get morning sun (the bees don't like to swing). Mason bees are active in the spring, so provide houses from February to July in Arizona. Holes that are being used will be plugged with mud.

Bee houses of this type will not attract Africanized honey bees or other social bees because honey bees need a softball-sized cavity or larger to build their honeycomb in.

Be the first person on your block with a bee house!

Additional Information on Mason Bees

from Washington State University King County Extension Publication 156

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 most of North America, particularly in wooded areas but often around homes in towns and cities.

Homeowners sometimes become concerned when they see the bee entering cavities under shake siding or investigating nail holes or other cavities in wood during March through early June. These are not destructive insects, since they do not excavate holes in the wood, though they will clean out loose debris. No controls are recommended, since no damage is done. To prevent the bee from nesting, holes may be filled with caulking.

The orchard mason bee is usually slightly smaller than a honey bee and a shiny dark blue in color. The actual size of the bee depends largely upon the size of the hole in which it grew. Males (Fig. 1) are smaller than females, have longer antennae and an additional tuft of light colored hairs on the face. Females (Fig. 2) have hairs on the underside of the abdomen, called the "scopa", adapted for carrying pollen.



Fig. 1 Male orchard bee. Note the long antennae. (The red coloring is caused by Chaetodactylus sp. mites riding on the bee.)



Female orchard mason bee on blossom.

Fig. 2 The female approaches the flower from the top, transferring pollen from other flowers in the process.

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 inches in diameter. The bee first places a mud plug at the bottom of the hole, then brings in 15 to 20 loads of nectar and pollen which she collects from spring flowers, including apples and other fruits. If you watch the bee closely as she enters the nest, you can see the pollen on the underside of her abdomen.

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. 3). Some wasps and leaf-cutter bees also build nests in such holes but their nests can be distinguished from the orchard mason bee nests by characteristics of the plug. The plug of the mason bee is always rough while the wasp prepares a smooth plug.(Fig. 4). Leaf-cutters seal the holes with chewed-up leaves.



Fig. 3 Orchard mason bee putting entrance plug in her nest.



Fig. 4 Trap nest with holes filled by female bee. Note smooth wasp plugs on the right.

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 about 10 days, the larva spins a cocoon 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 several days later. One or two weeks may be required for all the bees to emerge during cool weather.

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 and 3 to 6 inches deep in pine or fir 4x4's. A "brad-point bit" leaves a nice, smooth hole. 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 usually emerge in March and April. They should forage for pollen during the period of cherry and apple bloom and afterwards, if sufficient other flowers are available to them.

Using the Bee in Orchards

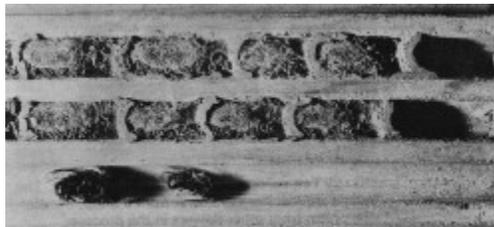
If you wish to develop large populations for orchard pollination, you should store the nests under humid refrigeration at 35 to 40° F. This will permit control of emergence time and reduce predation and parasitism by the insect enemies of the bees. Do not place the nests in storage until September or October to assure complete development of the adults. The following spring, place the boards in the orchards in plywood shelters 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 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. Once established, orchard bees will nest in containers filled with large-diameter drinking straws or paper tubes folded in half.

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.



Filled Orchard Mason Bee observation nest.

For Additional Information, See:

- **USDA Mason bee & nest block info**
<http://www.ars.usda.gov/Main/docs.htm?docid=10743>
- Product Information and Suppliers for Blue Orchard Bees, *Osmia lignaria*, and Hornfaced Bees, *Osmia cornifrons*, for Orchard Pollination
http://www.pollinatorparadise.com/Solitary_Bees/Supply.htm
- **The Beez-Neez Apiary Supply** in Snohomish, WA (not mentioned at the above site) carries Mason Bee equipment.
- **Knox Cellars**
<http://www.knoxcellars.com/>
source of mason and bumblebee info and equipment
- **How to Raise and Manage Orchard Mason Bees for the Home Garden**
http://www.ces.ncsu.edu/depts/ent/notes/Other/orn_t109/note109.html
by Stephen Bambara and James R. Baker, North Carolina WSU Extension
- **Modular Housing for Orchard Mason Bees**
<http://snohomish.wsu.edu/mg/ombblock/ombblock.htm>
by Randy Person
- **Home Made Paper Tubes for Orchard Mason Bees**
<http://snohomish.wsu.edu/mg/ombblock/paper%20liners%20that%20work.pdf>
by Randy Person.
- **WWW.Badbeekeeping.com.** <http://www.badbeekeeping.com/>
Beekeeping, the honey bee, and honey production are shown with news updated monthly; lots of photos; notices of meetings. Canadian and North American content.
- **Bees and Pollination:** USDA-ARS Carl Hayden Bee Research Center GEARS
<http://gears.tucson.ars.ag.gov/>
- **The Pollinator Partnership Home Page** www.pollinator.org
Aids fruit and vegetable growers and beekeepers to manage pollination for better crops.
- **Solitary Bees-An Alternative to Honeybees**
http://www.pollinatorparadise.com/Solitary_Bees/SOLITARY.HTM
Contains information that is useful for raising *O. lignaria* and several other species, including bumblebees. A valuable source of information for those interested in alternative pollinators and bees in general!

