

Orchard Mason Bees

The orchard mason bee (*Osmia lignaria*), native to this region, is a gentle, non-aggressive (they sting only if provoked) beneficial pollinator of tree fruits, some berries, and a few crops found throughout the state. The orchard mason bee is slightly smaller than a honey bee, shiny, and dark blue in color. Homeowners sometimes become concerned when they see these bees entering gaps under shake siding or investigating nail holes or other cavities in wood during the spring. Orchard mason bees do not excavate holes in the wood and are not destructive insects. No controls are recommended. However, holes may be filled with caulking to prevent nesting.

Pollinating with Orchard Bees

Mason bees are valuable specialist pollinators of native and cultivated tree fruits, such as apples, cherries, almonds, related plants in the Rosaceae (rose) family, plus some berries and a few other crops. They will forage for pollen mainly on these flowers when they are available but may visit a much wider variety of flowers for nectar. The adult bees are normally active for only about two months in mid-spring. Mason bees do not pollinate mid-summer vegetables.

Mason bees overwintered at normal outdoor temperatures in a barn, garage, etc. will usually emerge at about the time apples begin to bloom in the Puget Sound area. Refrigerating the bees from October through February at 37-41 degrees Fahrenheit will encourage more rapid emergence in spring. When cooling the bees, keep the air slightly moist with a damp sponge. If the bees begin to emerge before the crop is blooming, you can slow down emergence by putting the bees back in the refrigerator for up to a month. Incubating the bees at 80-84 degrees Fahrenheit a few days before the expected bloom will speed up emergence.

The foraging period of the bees can be extended a few weeks by refrigerating the bees during the winter until a week or two before you wish pollination. Refrigeration tends to slow down the emergence of the bees but may dehydrate and kill some of them if extended more than about two months.

The number of bees required to pollinate depends on the target crop's flower density, but a good rule of thumb is 2 to 3 female bees for each mature fruit tree. This equates to about 250 females per acre of fruit trees or 125 healthy, filled 6-inch nests or 350 3-inch nests. A single 20- to 50-hole nest block when fully colonized will usually be enough to

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pollinate a typical yard of trees and bushes. The blocks should be distributed as much as possible throughout an orchard, placing them on fences, piled up fruit boxes, or in plywood shelters as necessary. Either rustic or managed nest blocks (see below) can be used to pollinate fruit trees, but a managed system will better maintain a healthy and growing bee population. Mason bees will not conflict with honey bees or other species of bees unless they are exceptionally crowded.

Mason bees are valued because they are native and self-sustaining with minimal maintenance and, therefore, low cost. You can build up a sizable population starting with just a few nests or even from wild mason bees in your neighborhood. In a managed system, the population can build by a factor of 3 to 5 times per season, although some years may offer no buildup. Some bees will emigrate, and there will always be mortality. An average good multiplication factor is about 2 ½ times per year.

Cultivating Orchard Mason Bees

There are two cultivation methods for orchard mason bees, the “rustic” method and the managed straw-insert system. With either method, placement of the block is the most important consideration in successful mason bee culture. The bees require a warm, dry, wind-protected place for their nests. The best place is usually on the side of a house, shed, or other large structure, ideally facing east or south to catch the morning sun, and under an eave to deflect rain. The bees will avoid nesting in blocks placed out in the open.

Mason bees divide the nest cavity into cells and cap the egg cells with mud that they collect from the vicinity of the nest. In western Washington, mud is almost always available, but in other areas, you can ensure a good supply by creating a small depression lined with plastic, filling it with sticky mud and keeping it moist.

The bees will visit a wide variety of flowers for their energy source, nectar, and for pollen, which is larval protein food. They will fly 100 or 200 meters to find flowers, so the nests can be placed some distance away from the food source, although they will thrive when close to their food.

“Rustic” Method

The “*rustic*” culture method consists mainly of augmenting existing bee populations by setting out simple nest blocks. No attempt is made to manage the bees. Simple rustic nest blocks can be made of almost any kind of wood drilled with holes ¼” to 3/8” in diameter and at least 3 inches deep. An ideal material for a rustic block is a 4” X 4” post. Covering the blocks with a “bubble” of chicken wire mesh can discourage predators such as woodpeckers, crows, and squirrels, which may attack if blocks are left in place. The

bees will not mind flying through holes for a year or two, but become fouled, and/or the bees will then search for other nest replace the used ones. Re-drilling rid the blocks of parasites and soaking in chlorine bleach than making new blocks.



the mesh. The bees will utilize the eventually these simple nests will accumulate parasites. They sites. New rustic blocks can easily the blocks can be done but will not pathogens. Washing the blocks or solution is usually more trouble

A “rustic” method nest box

The Straw-Insert System

The second culture method, the “*straw-insert system*”, requires some management. In this method, paper straw inserts, made specifically for bee nesting, are inserted into the nest block holes. The bees nest in the straw liners, so the block itself becomes a reusable “holder.” When mature, nests in the inserts can be taken out of the blocks and examined for disease, parasites, number of bees, etc. Bad nests can be disposed of, and problems affecting the bees can be detected before they become serious. The ideal inside dimensions for mason bee nests with or without inserts are 6” deep and 5/16” in diameter.

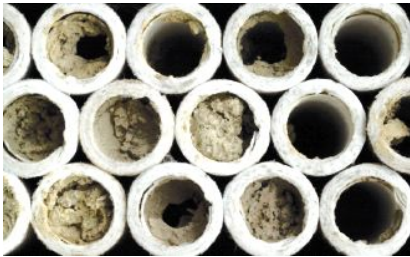
- 1. February-March.** In February or early March, set out the blocks and prime the nests with bees collected during the previous season or with purchased bees by setting the old nest with adult bees adjacent to the new blocks containing fresh straw inserts. Empty old nests (straw inserts) of bees by putting them in a closed cardboard box with a 3/8-inch hole in the side. Set the box under the new nests. The bees will exit their old nests and move into the fresh nests in the new blocks.
- 2. March- June.** Males emerge first to wait for the females. As soon as the females appear, they mate and begin making nests. They may make several nests and lay a total of 30 or more eggs, usually 3 to 10 per nest. Adult mason bees live for about two months.
- 3. April-May.** Remove and dispose of used straw inserts.
- 4. By mid-June** nesting activity is usually finished, and bee parasites begin to appear, so for best management, carefully take the blocks down and bring them inside for the rest of the summer. They can be kept indoors or in a fine-mesh screen cage in a garage, shed, etc. Handle the nest blocks very gently, because the developing larvae inside are fragile. Keep them upright.
- 5. September.** By September, the larvae have become adult bees. They will rest inside capsule-like silk cocoons until the next spring. At this time, you can take out the nest-

filled straw inserts and replace them with fresh inserts to be colonized by the next generation. The living bees in their nests can be examined now by carefully slicing open some of the paper straws. Unfinished nests or those with few or no bees should be discarded. They may contain diseased or parasitized bees or only males. Healthy nests should have 2 or more females for every 3 males.

6. October-February. Over winter, store the remaining healthy nest inserts in an unheated shelter or refrigerator. They will be set out again in the spring when the nest blocks are replaced. Then, you can put them in any type of holder attached to or placed near the nest blocks.

6. March. Put fresh straw inserts in the block and reposition the block in the yard or field if it was taken down for winter storage. Start again with Step 1.

Straw inserts



Mike Salsbury, The Olympian