Mason Bees

ALL ABOUT OUR BLUE ORCHARD MASON BEE

Scientific Name: Osmia lignaria (aka: Blue Orchard Bee, Mason Bee, Orchard Bee, Osmia Bee)

Size: 9 – 14 mm - shorter and stockier than a honeybee

Colour: black or black with metallic green/blue.

Description: can be mistaken for a housefly, but has two sets of wings and is covered in hairs

Conservation Status: Globally common – not threatened

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2 Mason Bee Honeybee

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1 https://www.natureconservancy.ca/en/what-we-do/resource-centre/featured-species/insects-and-spiders/blue-orchard-mason-bee.html
2 https://blog.ncascades.org/naturalist-notes/mason-bees-and-honey-bees-whats-the-difference/
3 http://esbeeshoney.com/mason-bees/

Quick Facts

- Native to North America – Common on Southern Vancouver Island
- Named for their habit of using mud 'masonry' to build their nests
- Gathers loose pollen all over its hair-covered body – known as 'super pollinators' (One Mason Bee can pollinate 2,000 apple blossoms in a day!) www.bcliving.ca/the-blue-orchard-bee
- Solitary – no hive – every female is fertile
- Builds nests in tubular openings in narrow gaps in the siding of buildings, tubular holes in dirt banks, hollow twigs, or man-made structures
- Does not make honey
- Does not sting unless enormously provoked (will not trigger anaphylactic shock)
- Can withstand very cold winter temperatures.
- Emerge in early spring – when daytime temperatures reach 13 C – before Honeybees.

Mason Bees in your Garden

- Consider the act of installing a Mason Bee 'house' in your yard or garden as a year-round commitment. Know which mason bee houses are safe for bees and be prepared to learn how to clean the house to protect the bees from pollen mites.
- Ideal flowers for Blue Orchard Mason Bees are early flowering fruit trees - cherry, plum or apple. But any early flowering plant will be visited by mason bees - you may want to add some early blooming plants like: Snowdrop (*Galanthus nivalis*), Hellebore (*Helleborus*), Heath (*Erica carnea*), Crocus, Tulip, Daffodil, Pig Squeak (*Bergenia cordifolia*), Primrose (*Primula vulgaris, P. veris, P. japonica*)

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Life Cycle

Adults emerge in very early spring – and pretty much mate right away. The female immediately sets out to find a nest site and starts visiting flowers to collect pollen and nectar.

Mason Bee mothers fill their tubular nests starting at the deepest end. She deposits a pollen and nectar bundle then backs out, turns around and backs in to lay an egg on the mass. Then she creates a wall out of mud to box in the egg and food source. This process is repeated as many times as possible until the tube is filled. She will plug the entrance with a final, thick wall of mud.

Over the following weeks the egg hatches and consumes the pollen and nectar bundle. By Fall it has entered the pupal stage. At some point in late fall or early winter, the bee matures to adult and lays dormant for the rest of the winter in its cocoon within the nest.

Male eggs are laid near the entrance of the tube and females in the back; therefore, males emerge first.

The Adult female will die within 6-8 weeks of hatching. She can lay dozens of eggs, fill several tubular nest sites and visit thousands of flowers. The male will die soon after mating, with a life span of about 2 weeks.

If the temperature rises in very early spring and triggers the bees to emerge but there are not many blossoms out, the bees will struggle to find enough pollen. In addition, if the daytime temperatures drop below 13 C after the adults emerge, the bees will have difficulty.

If the temperature remains chillier than normal after the female mates, she will only lay male eggs. If the temperature maintains normal spring levels, there will be both female and male eggs laid.

Artificial nest sites

Artificial Mason Bee nests ('houses') can be found at just about any garden centre or building supply store. Many craft markets will have interesting, fun designs for sale as well. There are multitudes of how-to videos on YouTube if you're the DIY type.

Many of the store-bought houses come with them, but you do not need pinecones or butterfly slots in your bee house. These are usually inhabited by spiders versus butterflies anyway, so better to just buy one without them – doing so will provide more space for nesting sites for bees!

In the wild, mason bee nests are rarely re-used; there is little opportunity for parasites to collect. However, a human made nest site is very likely to be made of materials that will not rot or be carried away by birds, so the likelihood of re-use is high. This provides opportunity for predatory mites and mold to take hold.

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Common problems of artificial nest sites:

- Pollen mites
  - do not infect the bee, but they feed on the food supply that the mother bee left for the larvae and will kill and feed on the egg or larvae as well.
  - After killing the egg or larvae, the female mite lays eggs in the cell which hatch 4-5 days later and the resulting nymphs feed on the remaining pollen, eventually turning into adult mites and thus, repeating the cycle.
  - If a bee emerges from a cell behind an infested cell, it is forced to walk through the mass of mites carrying them forward in the tube and possibly out. Sometimes the bee is so laden with mites; it is difficult or impossible to fly.

Hundreds of Krombein's hairy-footed pollen mites on a mason bee. Image by @GeeBee60.

  - Some mites stay behind and will infest the new mother bee and/or her eggs which provides the potential to move the mites to new nesting sites.
  - If the pollen mite kills the larvae within the tube, there will be no mason bee to emerge from that cell, therefore any bee behind it in the tube could die if it cannot emerge in its turn.
  - http://insects.ummz.lsa.umich.edu/beemites/Species_Accounts/Chaetodactylus_krombeini.htm
  - https://beebugs.blogspot.com/2013/01/pollen-mites.html
- Mold
  - Mold can develop when moisture cannot escape the nest. Avoid the use of plastic straws for this reason.
  - Ensure your artificial nest is protected from rain or run off – i.e.: under the eaves of a building, or on the trunk of a mature conifer.
  - Make sure there is an overhang to the roof of your nest.
- Predatory wasps
  - Can insert their egg right through the side of a paper nesting tube and into a developing bee – once the wasp hatches, it consumes the bee from the inside out ☹
  - Ensure your artificial nest is well protected by rigid material such as wood or ceramic and make sure it has a solid back wall.
  - These wasps are active usually at the time that mason bees are nearing completion of their cycle – you can remove your nest from harms way (once all the tubes are full) by storing it safely in a cool, dry place for a month or two. Be sure to put the nest back outdoors by fall so the bees experience the cooling temperatures.
- Birds
  - Woodpeckers/Sapsuckers can be a problem if your nest is located a distance from places where humans often are – these birds naturally avoid humans. Protect your nest with mesh that the bird cannot reach through if it is likely to be visited by these birds.

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Avoiding common problems

- Do not use plastic straws
- Use nesting material that can be removed and replaced or cleaned (bamboo shoots, paper straws or layers of thin wood that is channeled out). In order to be able to clean the nest, the nesting material should not be glued to the house.
- Make sure your 'house' is firmly affixed, and out of danger of being bumped or jostled. Jostling can knock the egg off its food source which can be detrimental to the developing bee.
- Ensure the nesting tube is at least 4 inches deep, 6 inches is better
- Change or clean your bee houses every two (or three at most) years:
    - In the spring before the bees emerge create an emergent box. Place a box over the house with only one exit hole and put it somewhere warm where it will stay dry. As the bees emerge, they will go out the hole you made but will not seek the house again for laying eggs because they don't like to pass through dark areas to find nesting spots.
    - Once the bee house is empty of bees, it can be cleaned. Or discarded if it's unsuitable (burn it or break it up) don't just toss it on the wood pile to burn next winter.
    - While you clean your bee house, you should have a replacement option for the bees to start nesting in. Since not all the bees emerge at once, some bees may be already starting to lay eggs while others haven't even emerged yet.
- If you have multiple nests, space them a distance apart – several feet at least, more is better. You want to avoid mega complexes which can become parasite complexes.

Cleaning Mason Bee Houses

After the bees have all left the nest, remove the emergence box.

Paper straws - simply discard them (burn if possible) and replace with new.

Bamboo – these can be washed with water and a small bottle brush. Make sure they are completely dry again before you put them back in the bee house.

Wood – wood nests that are made by drilling cavities in a grid pattern are nearly impossible to clean – do not buy this type. If you have a nest that is made this way – insert paper straws into the holes before putting it out.

Wood - nests that are made of layers of wood with grooves drilled out – separate the layers and brush the grooves clean with water and a nail brush. Make sure each layer is completely dry before replacing it.

It is not recommended that you 'wash' your mason bee cocoons. There are several websites that recommend this practice using sand or a solution of bleach and water but it's dangerous and not necessary. Adhere to a schedule for cleaning the nests every 2 - 3 years. Place your houses at a distance from each other and follow the basic rules for protecting the house from birds, being jostled, and getting wet.

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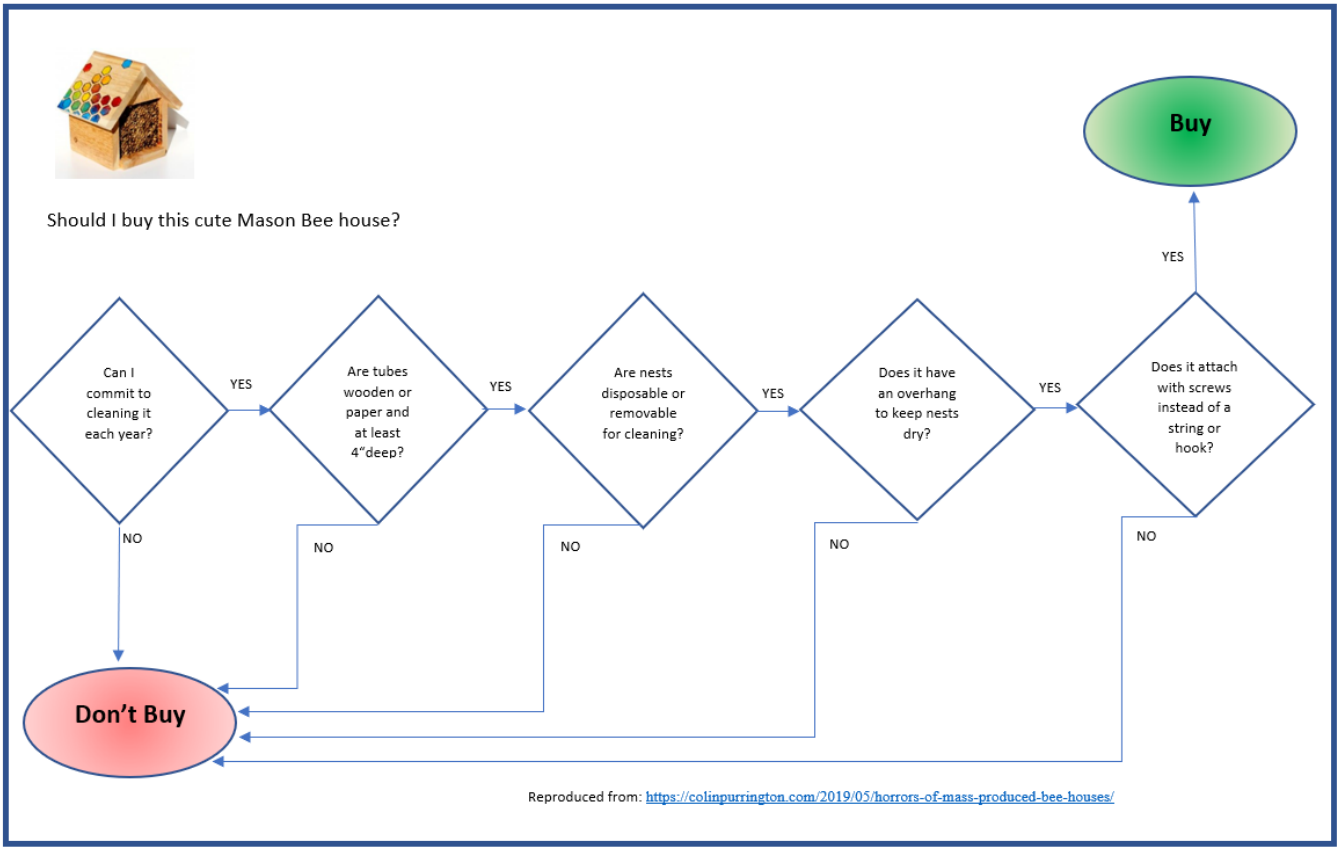
Here is a good decision matrix for buying a mason bee house and committing to 'raising' Mason Bees:



Yes

OK – but put paper straws in the drilled out holes

No

Holes cannot be cleaned

no overhang, some tubes are too large

no overhang, will swing; cannot be firmly affixed to a tree or wall

Cute, but a lot of wasted space,some holes cannot be cleaned

Victoria Master Gardener Association
Christina Cook, 2020

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Placement of a Mason Bee House

- Place your bee house in a sunny location.
- Ensure it is protected from rain and run off and woodpeckers.
- Place it in a location that allows you to easily watch it.
- Ensure your bee house is securely fastened to something solid – gusts of wind or being jostled could knock the larvae off its food source.
- Put your bee house out very early in the spring – February/early March, better yet leave it out all year.
- Be patient – the local bees will discover your house.
    - If you wish to purchase mason bee cocoons, do your research carefully, the sale of bees is not regulated, and you may end up with diseased bees.
    - Place purchased cocoons on top of the house, or very nearby so the emerging females find it right away.
- If you wait for the local bees to find your house, they may not fill it completely in the first year. But the emerging bees in the following spring certainly will!

Alternative to Artificial Bee Houses

The best way to encourage lots of mason bees is not necessarily to buy cute houses in trendy colours and funky designs, but to attract them with natural materials!

Ease up on the tidy, manicured landscape look and let some garden debris sit. Allow fallen branches to remain on the ground for the boring beetles to make their holes (which end up as mason bee nests!) and maybe leave a pile of hollow stemmed material after the fall clean up somewhere in your yard for bees to make natural homes.

Examples of hollow stemmed plants – comfrey, large grasses, bamboo, mature stalks of Himalayan Blackberry

Fun Facts!

1. Part of the reason Mason Bees are such great pollinators is that they have no finesse when flying. They basically look like the proverbial bull-in-a-china-shop while visiting flowers; bumping and thumping here and there bouncing off all parts of all the different flowers. It also helps that they are covered in pollen-collecting hairs.
2. Mason bees have a 95% pollination rate versus honeybees which have a 5% pollination rate! https://www.keepingbackyardbees.com/6-amazing-facts-about-mason-bees-zbwz1712zsau/
3. The female mason bee stores semen from mating – she will only fertilize eggs she wants to be female. Unfertilized eggs will be male.
   https://extension.oregonstate.edu/sites/default/files/documents/12281/masonbee.pdf