

HOW TO MAKE NATIVE BEE HOUSES

Good online sites:

YouTube:

1. <https://www.youtube.com/watch?v=LyE32Xy6zUA> Bee Chicas simplest version 5:51 minutes
2. https://www.youtube.com/watch?v=LS_5rntNexo 3:39 minutes
3. <https://www.youtube.com/watch?v=7AwB1QYb3Sw> 9:48 minutes
4. <https://www.youtube.com/watch?v=OtnRMNt3Mog> 16:37 minutes
5. <https://www.youtube.com/watch?v=PyntGvrpAXI> 14:41 minutes

Websites:

1. <https://extensionpublications.unl.edu/assets/pdf/g2256.pdf>
2. <https://pollinators.msu.edu/publications/building-and-managing-bee-hotels-for-wild-bees/>
3. <https://www.fs.fed.us/wildflowers/kids/activities/beebox.shtml>
4. <https://www.foxleas.com/make-a-bee-hotel.asp>
5. <https://www.gardeningknowhow.com/garden-how-to/beneficial/diy-bee-nest-ideas.htm>

Guidelines for all methods:

1. **Give bees up to a year to find your new nesting site.** To assist them, place it near flower sources; bees often do not travel more than a few hundred feet in their entire lives. Provide at least some native plants (they prefer natives four times as much as non-natives). To ensure they have a steady food supply, choose a large number of varieties, making sure that these will overlap in their bloom time of early spring to fall. See when Colorado native plants bloom: <https://conps.org/wp-content/uploads/2016/04/NativeGarden-Front-Range-4-11-2016.pdf>
2. **Protect the dwelling from:**
 - a. **Wind:** Fasten securely
 - b. **Rain and soaking moisture:** Put an overhanging roof on. Place the houses far enough off the ground that they do not get soaked by melting snow.
 - c. **Insect and bird predators:**
 - i. **Insects:** Keep it off the ground 3-4' to keep ants at bay. Consider making many small rather than one huge house, which invite predators to set up housekeeping too. If you see little holes chewed into a mud covering, then a parasitic fly has usurped the nest. Destroy these.
 - ii. **Birds:** To deter birds, cover the front with narrow gauge wire mesh. Make sure that the tubes have an opening only at one end, to protect them from both insect and bird predators.
 - d. **Disease**
 - i. Change out the nesting tubes and nesting blocks yearly, after the adults have emerged. Or, in drilled holes in wood, put fresh paper straws or hollow stems in each hole every year to keep clean and free of disease. If

using holes drilled into wood without additional tubes, replace the entire house every 2 years to prevent disease from bacteria, fungus and predators.

ii. Bigger ones may allow diseases to spread quickly. Instead, you can spread a number of smaller ones throughout the garden.

e. **Pesticides:** If possible, avoid using any herbicide or insecticide on your lawn or garden; they kill native bees nesting in the ground as well as above ground (even Roundup). If you must use pesticides, be sure to protect your bee hotel from drift, and do not spray flowering plants or near sources of water, where bees drink (like drip hoses or spigots). Always follow pesticide label instructions and observe the pollinator protection information, but realize that by instructing you to use them near dusk, they do not protect the evening and night pollinators.

3. Monitor for Problems throughout the summer:

- a. Moisture getting into the nest box
- b. Ant infestations (They are attracted to the protein-rich pollen provisions and developing bee larvae but can be prevented using sticky spray or ant bait at the foundation of the bee hotel.)
- c. Paper wasp nests; clean these out and fill in spaces with twigs or straws/stems.
- d. Predatory birds
- e. Spider webs (Their presence may indicate the nest location is too dark.)

4. **Size of holes: The holes should be 3/32" to 3/8" in diameter (2.3mm-9.5mm) and 3-6 inches deep.** As the hole diameter increases, the length of the tunnel should also increase (3-4" deep for narrow holes, and 5-6" for medium to large holes). To preserve the integrity of the wood, drill at least 3/4" apart. (Blue orchard bees prefer holes that are 5/16" wide and 6" long).

5. **Create smooth holes:** Bees will only choose to use tubes/holes that are smooth and splinter-free inside and sawdust-free at the entrance; remember their wings are easily torn. Drill with a sharp bit and at a high speed.

6. **Face the house or tube openings to the sun:** south and/or east where they get early morning sunlight but have protection from severe afternoon/early evening heat.

7. **But a back on the house** if the fence/building does not provide a backing.

8. **Make it darker:** Native bees tend to like dark-colored houses. Consider lightly torching wood frames. If painting, ONLY use water-based paints/finishes.

9. **Do not use pressure treated wood,** since these can contain chemicals harmful to bees. Newer methods of treating wood may not use these chemicals, but better be safe than sorry!

10. **Place them the right time of season:** In early spring (late-March to mid-April), place nest boxes outside at your chosen location. The mason bees will complete nesting by mid-June, whereas most leafcutter bees will complete nesting in July and August. Leave them alone until November, to avoid disturbing the developing larvae, then move them to shelter them from cold wet conditions (they can handle cold but not cold with wet).

Potential Problems with Commercial Bee Houses (and some DIY designs)

Before choosing a DIY option, it helps to examine the flaws with some commercial or homemade bee houses to know what to avoid.

1. Open Back Side

If the back of the bee house is open, parasites can enter from that direction. The tubes should have a wall on the back part of the bee house.

2. Unremovable Tubes and Blocks

It's likely a convenience for the maker of the bee house, but gluing the tubes together prevents the owner of the bee house from removing them. When you cannot clean out the tubes efficiently, there will be an increase in parasites, fungi, and bacteria. If you do need to seal the tubes into the back of the house to prevent them from falling out, make sure you replace them with fresh ones next year.

3. Poor Protection Against Water

Tubes that are flush with the front of the bee house have no protection against rain. Bee houses, like your own, need overhangs to prevent the water from coming into the tubes. The tubes may need to slant slightly downward to protect from rain as well.

4. Holes That Are Splintery or Rough

Bees are just like us in that they like to have a nice, comfortable place to live. Splintery reeds and unsanded bamboo are harmful to the bees. The insides of the tubes should be smooth.

5. Blocked or Insufficiently Sized Tubes

Bamboo makes for a picturesque bee house. Too often, bamboo is not prepared well enough. Sometimes, the bamboo nodes—those knuckles that give bamboo its characteristic look—are insufficiently sized or may even be blocked.

Simplest methods:

1. **Provide bare soil for ground-nesting native bees!** 70% of native bees dig tunnels in the bare earth, so a simple bare spot here and there (no mulch or grass, no weed barrier, just bare soil) may be enough for an aggregation of hard-working soil nesting native bees. Some bees may prefer a sand pile. Some bees dig just fine in clay, and others prefer soft and sandy soil. If you turn over turf, leave it for the grass to die, and native bees may find it.
2. **Drilling holes in dead trees, stumps, old posts, or standing logs:** These are important nesting habitats for 30% of our native bees. If you cannot tolerate a dead tree on your property, it may be possible to keep a stump or a standing log, and use it as an attractive planter. Perhaps it will, in turn, provide housing space for bees.
3. **Bundling #1:** <https://www.youtube.com/watch?v=LyE32Xy6zUA>.
 - a. Bundle 6-9" lengths of various widths of bamboo together and place on or off the ground or secure somewhere (like under a limb or in the crotch of a tree) (if placed on the ground, protect from drenching rains, and bring into shelter in November for the winter).
 - b. Make sure that one end is closed naturally, or by closing with clay, caulking or glue.
 - c. You can provide additional protection by wrapping the bundles in protective cloth.
 - d. Do not allow these to stay on the ground in snow season, but in November, bring under a shelter (like a cold garage) where they are protected from the weather, but cold enough to stay in hibernation/dormancy.
4. **Bundling #2:** OR, bundle 6-9" long hollow plant stems together and pack into a 7-10" deep container with spout end cut off. Examples: 2-liter soda bottle, aseptic containers (like those that hold plant milks, or vegetable/chicken broths, etc).

Some common plants that have hollow stalks: Leave these in the garden in the fall for native bees to use as nesting sites. Cut or remove them late the following spring after the adults have emerged. If you must cut them in early spring, store them in a protected place for the adults to emerge. Then compost them.

Sedum (like Autumn Joy)	Lovage, fennel, dill	Asters with large stems
Elderberry	Bee Balm	Tall grass flower stalks
Decorative onion	Lettuce flower stalks	Honeysuckle
Garlic chives	Catnip	Sumac
Raspberries, blackberries	Sunflowers	Wild Rose
Hollyhocks	Joe Pyeweed	Larkspur/Delphinium

Guide For Building a Bundle Bee House (adapted from

<https://www.thespruce.com/build-a-diy-bee-house-5112611>

You can make a simple, inexpensive, and safe bee house using just a beverage bottle, clay, and natural tubes such as bamboo, stems of last year's plants, or paper straws

Materials

- 1-2 liter soda bottle or quart or half gallon sized waxed beverage container
- Tubes: Bamboo (dried and clean) and/or dried hollow flower stalks/stems and/or paper straws
- Modeling clay or glue or caulking

Tools

- 3/8-inch dowel if using bamboo
- Hand saw
- Utility knife
- Scissors or garden clippers
- Measuring tape or ruler
- [Fine-grit sandpaper](#)

Instructions

1. With the utility knife, slice off the spout end of the soda bottle or similar container. Remove all labels and wash out the cylinder.
2. Sand off sharp ends of the bottle's edges.
3. Measure the length of the cylinder.
4. Cut off the bamboo or stalks to 2 inches less than the length of the cylinder. This allows for an overhang to protect the tubes from rain.
5. Carefully trim away bamboo splinters and sand them down smooth. Run a dowel down each bamboo piece to check for clearance. Discard any with nodes that block the bees' access.
6. Glue a short strip of sandpaper at the end of the dowel and run it up and down each bamboo piece to smooth the insides.
7. Form a disk of modeling clay about 1-inch thick and press it into the back side of the cylinder.
8. Pack the cylinder with the bamboo pieces and straws or stems, forcing them into the modeling clay. The clay holds the tubes in place. The bamboo pieces should be tight and secure.
9. When you are finished, solidly mount the bee house to a post, fence, or wall so that it does not move around.

Guide for Drilling Wooden Nests

Materials and Tools

- Untreated wood or old tree stumps, standing snags, or logs at least 4" thick
- Drill
- Long drill bits of various diameters
- Rain protection
- Wire mesh to protect from predators (optional)
- Latex paint (optional).

Instructions

On one side, drill a series of holes of varying diameters to attract a range of bee species, from tiny to large. The holes should be between $3/32$ " and $3/8$ " in diameter and 3" to 6" deep. (Blue orchard bees prefer holes that are $5/16$ inches wide and 6 inches long). As the hole diameter increases, the length of the tunnel should also increase. Smaller drill bits create thinner and shorter holes that can be used by small bees that nest successively in numerous small holes.

Separate the holes by at least $3/4$ inches to ensure the integrity of the wood block. Most bees prefer a closed-end tunnel so do not drill completely through the block. If holes are drilled all the way through, attach an opaque backboard. Drill with a sharp bit and at a high speed as bees avoid rough interiors that could damage their wings.

Decorating your bee hotel with paint on the outside can help attract bees from long distances to the nesting tubes and protect the structure from rain.

Next harder method: Birdhouse-like Structure

See: https://www.youtube.com/watch?v=LS_5rntNexo 3:39 minutes

Just make sure that the depth of the house is 7-8" in order to fit 6" long tubes or drilled branches into the structure. This demonstration does not adequately allow for the needed 6" tubes for the larger-sized bees.

1. A bee house can look much like a birdhouse. A large box contains a combination of wood blocks and many smaller reeds or cardboard tubes or paper straws (NO PLASTIC or PLASTIC-LIKE CORN-BASED STRAWS!) that allow the bees to nest. The box should provide sufficient protection from the weather; bees can stand cold but not soaking wet in the winter.
2. Use old wood or blocks of untreated wood 8-12" long of various widths (i.e. 2x4s)
 - a. Bore with various sizes of drills using a variety of hole diameters from 1/8" or 1/4"-3/8"
3. Buy 6" cardboard tubes for leafcutter/mason bees online.
4. To provide habitat for ladybugs as well, wrap cardboard and tie it into tubes.