

Supporting our native bees

Bumblebees may be the most familiar native bees in North America; they won't nest in our bee hotel, but you'll see them nearby. They nest in abandoned rodent holes, thick grass, bird boxes or trees. While they build and provision nests individually, unlike honeybees, their nesting habits also differ from those of completely solitary wild bees—such as those that will visit the bee hotel here—because they are built in clusters of cells around a queen (inset).



Kinman Biological Survey • Kent, Ohio, Cincinnati, OH

The “bee hotel” to your left provides extra habitat for wild bees—essential partners in the process of pollination for the majority of flowering plants, including our food crops. Honeybees, the best-known bees in North America, were first brought to the United States from Italy in 1859 and have naturalized. Yet there are some 4,000 species of native North American bees and an estimated 20,000 species of bees worldwide.

Most of our wild bees nest below ground, but some prefer to nest above ground in stems, hollow cavities in tree snags, or other tunnel-like openings. Unlike honeybees, these solitary bees work alone and do not have a colony to defend. During their brief adult life, they are busily involved in collecting nest materials for their offspring and are not likely to sting unless stepped on or trapped.

The Rockefeller Prairie is home to several wild bee species actively involved in pollination, an important ecological service. Because most wild bees are solitary, individual females build, provision and lay eggs within a nest. The increasingly popular bee hotels offer artificial nest sources that may be used by these particular bees. The morning sun helps bees warm up and become active, so our bee hotel faces southeast.

Wild bees are important insects with simple needs much like our own. They need food (pollen and nectar), water and shelter. You can help provide these resources in your own backyard. For more information about solitary bees, providing high quality habitat and conserving these organisms, visit the website of the Xerces Society for Invertebrate Conservation at www.xerces.org.

Special thanks to the employees, along with their family members, of PROSOCO Inc. and Clark/Huesemann Architects, both of Lawrence, Kansas, for design and construction of this bee hotel as part of the U.S. Building Council's Green Apple Day of Service.



Clockwise from top left: Cross section of a bee hotel showing leaf cutter bee nest, larvae, pupae (Beediverse.com); leaf cutter bee pollinating a gallardia flower (Xerces Society); carder bee gathering plant fiber (Liz Henwood); Blue Orchard bee closing nest (Xerces); leaf cutter bee collecting nest material (Liz Henwood); bumblebee “buzz pollinating,” by shaking, a tomato blossom (Xerces).

BEE FACTS: Life cycle and activity

Nest construction: The subset of wild bees that may use this bee hotel include leaf cutter, mason, resin and carder bees. These bees use specific materials to build and separate their brood cells. As their names imply, these bees use pieces of leaves, mud or clay, resins or plant fibers in nest construction. Another type of solitary bee, the mining bee, builds nests underground.

Brood cells: Inside each nest is a series of small compartments that house each developing bee along with a mix of pollen and nectar used as food by the larva. Like butterflies, bees go through complete metamorphosis as they grow from egg stage to larva to pupa to adult.

Pollinators: Any organism that moves pollen (sperm-producing cells) to the stigma (female organ) of a flower resulting in pollination of that plant can be considered a pollinator. Bees tend to visit several flowers of the same plant type while foraging, increasing the likelihood of pollination.

Pollen carrying structures: Bees must have adequate pollen and nectar for their own survival and to feed their young. Bees have hairs on their bodies to collect and transport pollen from flowers to the nest. The types of bees that use the bee hotel have a brush of hairs beneath the abdomen called a “scopa.”

Crop pollination services: Bees do not pollinate specifically to help plants; this happens incidentally as they gather nectar and pollen for their own sustenance. Nevertheless, different bee species are especially equipped to pollinate specific plants, and some solitary bees are managed for their exceptional ability to pollinate crops. For example, the Blue Orchard bee, *Osmia lignaria*, is more than 20 times more efficient at pollinating orchard trees than the honeybee. These bees emerge early in the spring at the same time fruit trees are in bloom.



Mining bees nest underground but provision individuals cells just as other solitary bees do.