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CARPENTER BEES (*Xylocopa* spp.)

Carpenter bees (*Xylocopa* spp.) have a worldwide distribution. There are seven species found in the United States. Carpenter bee adults seek out and excavate tunnels in dead wood. In the natural environment this includes forest snags, dead trees, and tree stumps, but they are considered a nuisance pest when they excavate wooden man-made structures. Repeated years of infestation can cause serious structural damage.



Fig. 1: Carpenter bee

Carpenter bees are frequently misidentified as bumble bees, but these two types of bees are different in their habits of behavior, size, and appearance. Carpenter bees are mostly solitary, while bumble bees live in small colonies of up to 400 individuals. Carpenter bees excavate galleries in wood, while bumble bees build underground nests. Carpenter bees are generally larger than

bumble bees being $\frac{3}{4}$ to 1 inch in length (Fig. 1). Carpenter bees have hairless shiny black abdomens, while bumble bees have yellow and black hairy abdomens. Both female bumble bees and carpenter bees can sting. Male bees, because they have no stingers, cannot sting and so are harmless.

Biology and habits:

In Connecticut, carpenter bees can be found actively flying around buildings in the spring. Males are territorial; they patrol a small area looking for females to mate with, hovering for long periods. Any movement in their territory will alert them to fly over to investigate. This may cause alarm when they fly near people but they are harmless. Female carpenter bees chew holes into exterior wood surfaces. The holes are perfectly round and the size of a dime. Common tunneling sites include eaves, fascia boards, porches, decks, wood railings, fence posts, wood shingles, window and door trim, outdoor furniture, telephone poles, dead tree limbs and any other sites where there is exposed wood. Tunnels tend to be located on the sunny side of a building. Carpenter bees prefer to excavate exposed unpainted softwoods such as redwood, cedar, cypress, fir, spruce and pine. The excavating bee will bore straight into the wood for approximately one inch. She then will turn 90° following the grain of

the wood and chew a tunnel up to 10 inches long. The wood is not eaten but expelled from the tunnel as fine sawdust. It takes a female about 6 days to chew one inch of tunnel. Females are known to refurbish old tunnels from previous infestations, expanding them with more galleries. At night, female carpenter bees often rest in the tunnels they are constructing. Occasionally, a female might rest overnight on foliage, not far from her tunnel.

Once excavation is complete, the female makes a series of cells starting at the deepest point of the tunnel and working her way back toward the entrance. Each cell is stocked with a mixture of pollen and nectar called "bee bread" and she lays an egg onto the food. Each cell is sealed with chewed wood pulp. A female may produce six to eight brood cells before she dies (Fig. 2).

After hatching, the larvae feed on the pollen and nectar until they mature in late August. Adults emerge in the reverse order of the eggs being laid. The first adult to emerge is from the cell closest to the entrance of the tunnel, while the deepest cell will be the last to produce an adult.



Fig. 2: Carpenter bee gallery and brood cells

New adults emerge by chewing their way through the cell partitions. During late summer and fall, some adults disperse to new locations, while others collect and store pollen in their natal tunnels in preparation for hibernation. The adult bees overwinter and emerge to mate in the spring, when

temperatures reach 70°F. There is one generation a year.

Control:

Exposed non-painted wood, nail holes and saw cuts are attractive sites for carpenter bees. They can be deterred by painting wood with oil or polyurethane based paints. Wood stains are not effective against carpenter bees. Pressure treated wood can have some deterrent effects. Covering exposed wood with aluminum, vinyl, asphalt or other similar non-wood materials may prevent carpenter bee activity.

Many pyrethrum-based aerosols are labeled for bee and wasp control. They usually come with a straw attachment. Use this to direct the steam of the spray into the entrance of each tunnel. Treat tunnels at night. Be cautious about possible back splash when spraying and wear protective clothing and eyewear. After spraying, cover the hole with duct tape for 24 hours. This contains the pesticide. Remove the tape and watch for any further activity. Repeat the procedure if the female is not killed.

Pesticide residual dust treatments can also be effective. Treat tunnels at night. As the bees move around, they encounter the dust. It may be absorbed through the integument (outer skin) or in grooming, be ingested. Read the manufacturers' recommendations carefully before treating for carpenter bees.

A licensed pest management professional (PMP) may be needed if carpenter bee activity is heavy or in difficult to reach areas.

Once the carpenter bees have been controlled, use wood putty or like materials to seal the entrance holes. This will discourage future activity and possible wood decay.