

# MAINTENANCE GUIDEBOOK VII TERMITE, INSECT, AND RODENT CONTROL

## CHAPTER TWELVE - WASPS AND BEES

### SECTION A CHARACTERISTICS AND RECOGNITION

#### 1. GENERAL

There are thousands of kinds of wasps and bees in North America, most of which are small wasps that parasitize other insects and solitary burrowing bees. However, there are only 50 or so species of stinging wasps and bees that are troublesome to people. These are generally divided into two groups: the social wasps and bees (hornets and yellow jackets, umbrella wasps, and honey bees) and the solitary wasps and bees (mud dauber wasps, cicada killer wasps, and carpenter bees).

Social wasps and honeybees build nests in and around dwellings: beneath eaves, on porches, behind blinds, in trees, shrubbery, and vines, in stone walls, and even in the ground. Most of the social wasps prey on destructive insects (house flies, blow flies, caterpillars, and moths) that they feed to their young (larvae). From this standpoint, they are considered beneficial. Honey bees gather nectar from flowers and convert it into a thick viscous liquid we call honey, which is fed to both adults and larvae. Solitary wasps prey on insects they paralyze and place, along with eggs, into individual nests. After the eggs hatch, the larvae feed on those insects until they can emerge from the nest.

#### 2. SOCIAL WASPS

Social wasps live in colonies that have a caste system (division of labor) with overlapping generations, and all offspring are produced by a single fertile reproductive female called the queen, by laying eggs. The other two adult forms in social-wasp colonies are the fertile males that mate with queens and the female workers, which are sterile. Their social colonies persist for many years, unlike other stinging wasps which start anew each year.

All social wasps develop in similar ways. In the autumn, queens and males leave the nest to mate. The males die after mating, but the queens hibernate over winter in some protected area such as a crack, under tree bark, in buildings, attics, and basements, or in a hole in the ground. Next spring, the queens come out of hibernation, find a suitable nest site, construct simple, small, paper-like nests made from masticated wood and plant fibers mixed with water, and lay 25 to 70 eggs. The queen will not lay more eggs until that first brood has matured. Larvae hatch in a few days and glue themselves into the cells. The queen will feed the larvae chewed up bits of insects over the next twelve to

eighteen days until larvae mature. When mature, larvae spin a silken cap to close the cell and pupate (undergo metamorphosis into an adult). Once the first brood emerges as adults, the queen resumes egg-laying. Subsequent larvae produced by the queen are fed by the first generation of workers who also expand the comb or nest. The queen and workers do not eat the insects they collect for larvae. They subsist entirely on flower nectar and a sweet liquid provided by larvae when fed. With the onset of cold weather, wasps abandon the nest, which disintegrate from actions of weather, birds, or squirrels. The only member of the colony that over-winters is the fertilized queen.

Although yellow jackets and umbrella wasps are closely related and have similar life histories, their nest-building habits differ.

#### a. Umbrella Wasps

The nest of the umbrella wasp (Fig. 12-1) best demonstrates a basic building pattern. Nests are made of paper-like material produced by the wasps, but appear as a flattened, circular-shaped comb of cells opening downward. These are initiated by the umbrella wasp queen, which starts the nest with a thick paper-like strand attached to an overhanging structure, then adds a small number of cells.

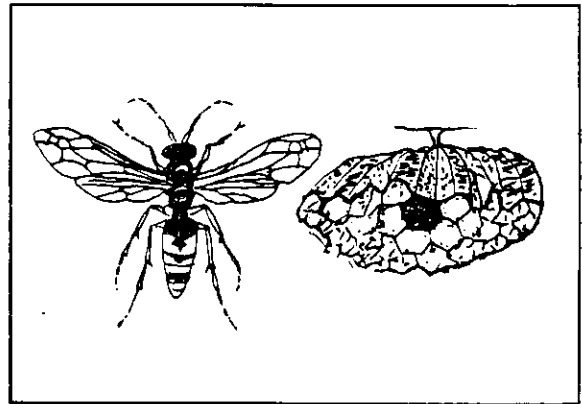


Figure 12-1

Umbrella wasps are slender and elongated, 3/4-inch to 1-inch long. They are black, brown, or red with a few yellow markings. An umbrella-wasp nest usually contains less than 250 individuals.

#### b. Hornets and Yellow Jackets

**Aerial Nest Builders:** Aerial nest builders (Fig. 12-2) include hornets and some yellow jackets, which build large football-shaped nests from paper materials similar to those of the umbrella wasp. These nests do not consist of a single, flat comb like that of the umbrella wasp, but contain from four to six wide circular combs, one hanging below the other, and all enclosed in an exterior multi-layer oval paper envelope which provides

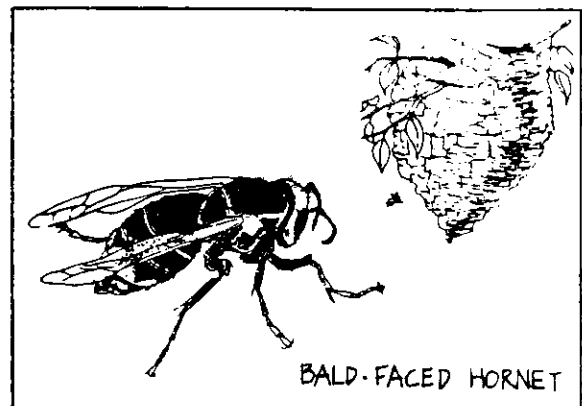


Figure 12-2

insulation. These nests are usually found on branches of trees, in shrubbery, and on gables. Hornet nests may only contain 500 to 600 workers, but yellow-jacket nests can support up to 10,000 individuals.

**Underground Nest Builders:** Underground nest builders (Fig. 12-3) include other yellow jackets that place a protected nest in a natural ground depression, rodent or animal burrows, or into building-wall voids, attics, hollow trees, and other enclosed spaces instead of in the ground. Once workers begin to care for the nest, they enlarge the entrance hole and try to expand the nest. Combs are placed in tiers, one above the other, and nests can become very large and contain up to 15,000 individuals.

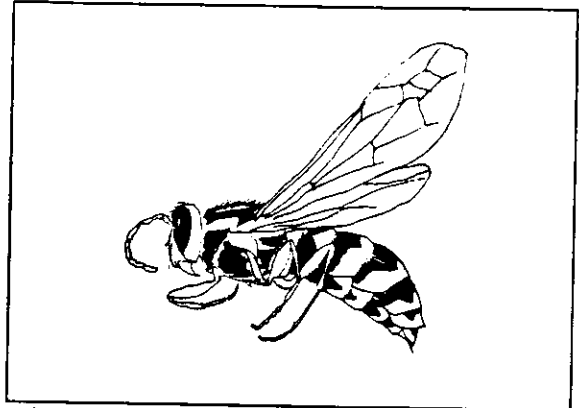


Figure 12-3

Hornets and yellow jackets are black and have yellow or white markings and are more compact in appearance than umbrella wasps. Hornet and yellow-jacket queens measure about 3/4-inch long. The males and workers are about 1/2-inch long. These wasps are feared because of their vicious sting. Populations are at a peak from late July to late September. Hornets and yellow jackets become more aggressive and easily irritated in the fall as the colony becomes old and there are fewer larvae to provide foraging adults their "sugar hit."

### 3. SOLITARY WASPS AND BEES

Solitary wasps and bees do not build large social nests; instead females dig a hole in the ground, or tunnel into wood, or build a nest out of mud. They then construct a cell or group of cells into which to deposit eggs, provide the eggs with a food source (pollen, or paralyzed insects), and abandon the nest, leaving the young to hatch and mature on their own.

#### a. Mud Daubers

Mud daubers (Fig. 12-4) are slender wasps, about 3/4-inch to 1-inch long. They are black and yellow, metallic blue, or shiny black, and do not sting unless held in the hand. Their nests are long clay cells placed in such protected places as electric-motor housings, stored machinery, sheds, outhouses, attics, on house siding under overhangs, and under porch ceilings. Occasionally wasps construct their nests on painted surfaces. Removal of these nests and repainting are an extra burden on the HA maintenance staff.

Mud daubers stock their clay nest tunnels with a paralyzed spider, caterpillar, or other insect. Inside a silken cocoon they deposit fertilized eggs on the prey and close the nest hole. When the eggs hatch, the larvae feed on the prey, and adults emerge in spring. In the fall and spring, abandoned nests often house carpet-beetle larvae that feed on residual organic debris in the open clay tunnel. Indoor carpet-beetle infestations have been traced to abandoned mud-dauber nests.

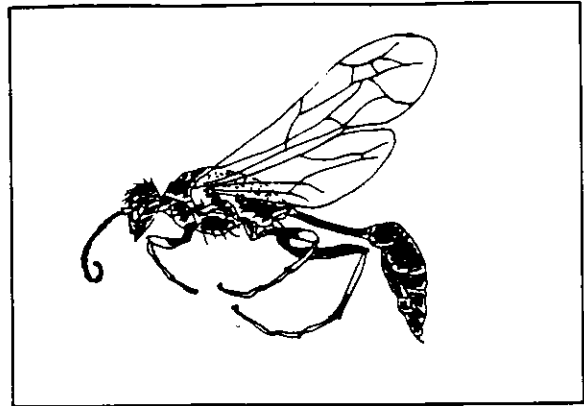


Figure 12-4

**b. Cicada Killer Wasps**

Cicada killer wasps (Fig. 12-5) are very large (1-1/8 to 1-5/8 inch long) solitary wasps with a black body; the first three abdominal segments are marked with yellow across the thorax, similar to smaller yellow jackets. Legs of the cicada killer wasp are yellowish and wings are brownish. Adult cicada killer wasps feed on nectar. In late summer, the female digs a conspicuous burrow (nest) in the ground (often in lawns or gardens) with a horseshoe-shaped mound of dirt at the entrance. Burrows may be 1-inch to 1-1/2 inches in diameter, two to ten inches under the surface of the ground, and up to eighteen inches long. The female constructs three to four cells at the end of the tunnel, which she stocks with a paralyzed cicada or two, and lays an egg in each cell. After eggs hatch, larvae feed on the cicada. Mature larvae hibernate over winter in the burrow, pupate in the spring, and emerge as adults from late July to August.

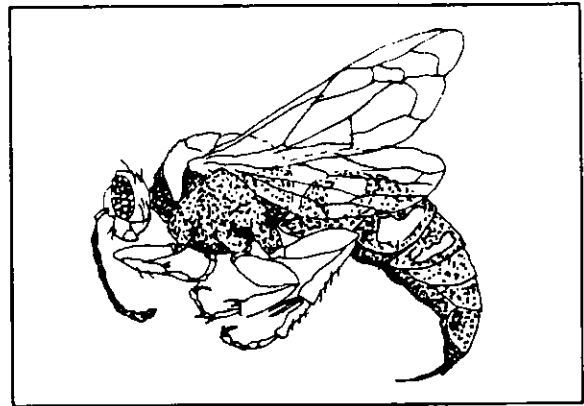


Figure 12-5

Although cicada killer wasps are helpful in reducing cicada populations, they frighten residents because of their large size and the numbers frequenting attractive egg-laying sites. Male cicada-killer wasps guard the burrows; although they may aggressively fly at an invader, they do not sting. Females rarely sting, usually when provoked.

### c. Carpenter Bees

Carpenter bees (Fig. 12-6) are smooth and shiny solitary bees with a mostly black abdomen; they are not hairy as are bumble bees. They bore into wood to make a tunnel in which they lay eggs and supply developing young with pollen.

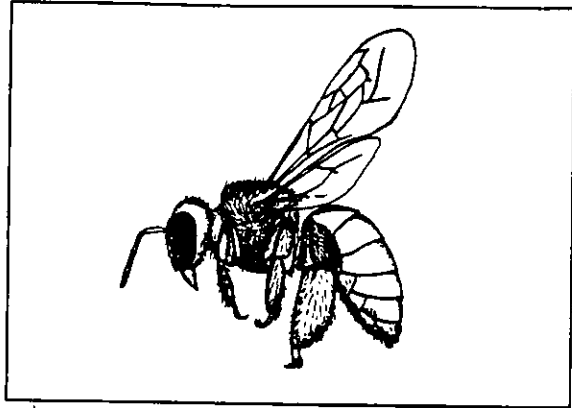


Figure 12-6

## 4. HONEY BEES

Honey bees (Fig. 12-7) make social colonies of up to 60,000 individuals that live through a number of seasons. Individuals survive the winter by clumping together into a tight group to conserve heat and feed on honey collected and stored during the preceding summer. The number of individuals in a honey-bee colony increase during the spring nectar flow (flower bloom) and develop a queen cell. Before the new queen hatches, the old queen and about half of the bees leave

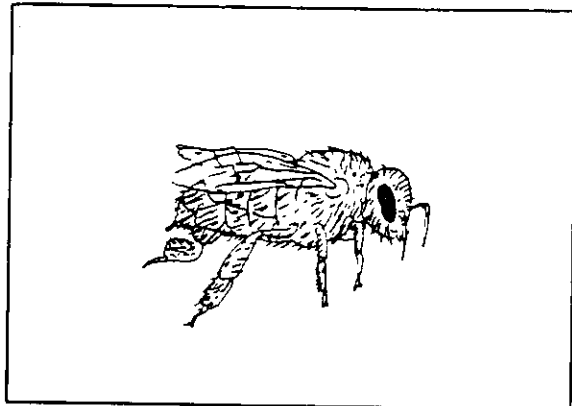


Figure 12-7

(swarm) the colony and establish a new one in a protected hollow tree, rock void, attic, or building void. Both the original and new colonies increase in number over summer, and swarm again the next spring. Africanized (an aggressive wild bee escaped and moving North into the U.S.) honey-bee colonies have the same life cycle as the European honey bee in the United States, except that Africanized honey bees produce less honey during summer and the colonies swarm much more frequently. Wild (colonies not housed in hives) honey-bee combs appear as long, hanging tiers of cells joined together at the top and made from wax that worker bees produce.

## SECTION B HAZARDS OF INFESTATION

### 1. HAZARDS

Yellow jacket problems develop in August or later, when their populations and nest activities are the greatest. Yellow jackets are extremely aggressive wasps and, when stinging, release odors that further enrage the entire colony.

When disturbed, bees and wasps drive a needle-like stinger (modified egg laying organ) into a victim's

flesh and inject a venomous fluid. The venom causes painful swelling that may last several days. Stings may prove fatal to persons allergic to the venom who do not immediately use an anti-venin or consult a doctor.

## **2. TREATMENT FOR WASP AND BEE STINGS**

If stung by a wasp or bee, apply an ice pack, then a paste made from bicarbonate of soda and water to the area around the sting. If stung by numerous wasps or bees, or if allergenic reactions appear, immediately contact a doctor for advice.

## **SECTION C INSPECTION AND MONITORING**

Inspect areas above doorways, holes leading into structures, and hollow trees or rotten tree stumps for stinging-insect nests. Keep records of persons stung in a given area. Monitor garbage cans for the numbers of wasps or bees feeding there over a set period of time. Take control action when fifteen or more foraging wasps or bees visit an open garbage can in ten minutes. Sting incidents increase, based on sting records, when ten or more wasps arrive at a can in ten minutes. Good records should allow correlation of stings with numbers of foragers. This monitoring information can be used to predict when action may need to be taken to control these generally beneficial insects.

## **SECTION D CONTROLS**

### **1. SANITATION**

Good sanitation controls the amount of food available to wasps. Denying food forces worker wasps to find less abundant natural prey and limits the amount of nutrition which larvae receive during periods of exponential colony growth. This ultimately restricts the colony size. Following are sanitation measures which will reduce wasp and bee problems:

- Keep garbage cans tightly closed.
- Check cans often for gaps and holes; request frequent garbage pickup.
- Install garbage liners in cans; promptly clean up garbage spills.
- Spray the inside of garbage cans with household ammonia to repel wasps and hornets.
- Frequently clean both inside and outside of garbage cans with steam or soap and water.
- Move dumpsters and trash barrels away from doorways or other areas of human traffic.
- Prevent the accumulation of standing liquid waste from garbage or dumpster containers underneath the dumpster or in low-lying areas.
- During summer, yellow jackets are attracted to meat; keep food covered.

- Clean up all food or drink spills that attract bees and wasps; wipe outdoor food-preparation surfaces and picnic-table tops with diluted ammonia solutions.

## **2. EXCLUSION**

Some methods of exclusion appropriate to a development are:

- Assure that all doors and windows close tightly and that screens are in good condition.
- Frequently and carefully inspect structural exteriors and seal up all possible wasp or bee entry spots.
- Seal up holes in hollow trees and remove rotten stumps.

## **3. PHYSICAL, MECHANICAL, AND CULTURAL CONTROLS**

Whenever working around wasps and bees, wear protective bee veils and coveralls. Do not allow bystanders and pets to remain nearby. Only approach honey-bee nests on warm and calm days. Bees are more aggressive on cloudy and windy days when foraging is not possible. Avoid walking through the flight paths of foraging wasps and bees leaving and returning to the colony. At night, avoid shining lights or casting shadows on the nests; use red lights when working on colonies at night. Walk softly near ground-nesting bees and wasps to avoid making vibrations that alert the bees. Carefully and slowly brush off a bee or wasp that lands on a person, or wait until it flies off. If stung, remove the stinger by scraping it from the side, apply cold water or ice in a wet cloth, lie down, lower injured arm or leg, and don't drink alcohol.

Inspect and remove all small wasp nests early in the spring, while nests are still small. Removal at this time of the year is easily done with a broom, vacuum cleaner, garden hose, or other mechanical means. Later, nests will be much larger and better guarded by workers. Watch for honey bee swarms in April and May when they begin to search for new nesting places: including holes leading into structural voids. (Honey bee swarms are easily collected by professional beekeepers from nearby trees and bushes before they find such holes.) Swarms can be discouraged from nest establishment in buildings by various mechanical means such as providing a hive box.

Nesting pests in wall voids can be detected by using a stethoscope. Yellow-jacket nests in wall voids do not necessarily require removal since they do not contain honey and are not reused in the following year. Abandoned nests, however, may attract fabric pests.

Do not seal up active nests before killing the insects. If wasps are sealed into wall voids without an exit, they will chew through the wall to exit somewhere else, even into the interior of the house. If honey bees are sealed into wall voids, melting honey will spoil, rot, and stain the wall. After destroying

nests, close up holes with copper gauze, caulk, duct tape, spackle, putty, or screening.

Use outdoor lights that are not attractive to insects. Remove stumps, dead limbs, hollow trees that can be used for nest sites. Remove plants that attract wasps and bees, including those that are vulnerable to scale or aphid attack, which produce honeydew food sources for wasps.

Sticky or jar traps may be used to capture wasps; however, traps reduce only a small number of foragers.

Keep a list of local beekeepers who may voluntarily remove honey-bee nests. Remove dead honey bee colonies and residue from walls so remaining organic debris and odor does not attract more insects.

Don't go barefoot; don't make unnecessary movements, and don't strike at individual wasps or bees flying nearby. In areas frequented by such insects, avoid wearing perfumes, scents, hair spray, suntan lotion, shaving lotions, talcum powder, cosmetics, and brightly colored or highly patterned clothing, which are attractive to bees and wasps. Examine wet towels before use to see if insects are taking moisture from them. Reduce honey bees on lawns by closely mowing clover and flower heads.

#### **4. OTHER CONTROLS**

##### **a. Biological Controls**

Biological controls show little promise; parasites, predators, and pathogens are mostly effective only on small, weakened colonies.

##### **b. Heat**

Wet or dry temperatures of 130 degrees F effectively kill wasps and bees. If an infested area is covered with a plastic tarp, the summer sun generates lethal heat to kill them.

##### **c. Vacuum**

Wasp and bee nests can be removed with an industrial vacuum cleaner. Wear protective clothing. Be sure the vacuum nozzle is placed over the only entrance hole before disturbing the nest. When the last of the colony is removed, plug the vacuum bag with cotton and heat it in the sun to kill the insects.



**d. Soap**

Cold soapy water effectively kills bees and wasps.

**e. Other**

- Carbon dioxide foam used for fighting fires is effective in stopping flight and suffocating bees and wasps.
- Spread a plastic sheet over areas where colonial, ground-nesting bees are located. A number of bees may temporarily remain around the plastic, but they will leave after a couple of days. Another alternative is to flood the nest areas with water containing a little soap to drown the adults and larvae.

**5. CHEMICAL CONTROLS**

**a. Poison Baits**

Several commercial pesticides are available which foraging wasps and bees carry into the nest; however, poison bait doesn't always work well for all types of wasps since different colonies of yellow jackets have different foraging habits and food preferences. Further, poison baits may kill valuable domestic honey-bee colonies. Poison baits should not be accessible to children and nontarget insects and animals.

**b. Aerosol Sprays for Aerial Nests**

Commercial aerosol preparations are available that quickly and safely destroy aerial wasp and bee nests. Follow label directions.

**c. Insecticides for Subterranean Nests**

After locating and sealing all entrances but one, properly labeled insecticides can be poured into subterranean colonies and the entrance plugged. Do not seal all entrances of nests located in building walls without killing the colony; wasps will chew through walls into interior spaces in an effort to escape.

**d. Dusts and Aerosols for Wasp and Bee Nests in Wall Voids and Attics**

There are residual pesticide dusts and aerosol formulations available to treat nests in building

walls and attics. Follow label directions. Having found the location of a nest (by listening for buzzing behind wallboard), drill a hole and inject aerosol or dust directly into the colony. Killing honey bees in walls with pesticides causes deterioration of honey and nest combs and attracts other bees and troublesome insects; melting honey and wax may stain walls unless the structure is opened up to remove the debris. Contact your local beekeeper association for assistance, if necessary, in removing honey bees by means other than pesticides.

**END OF CHAPTER TWELVE**