
YELLOWJACKETS AND OTHER SOCIAL WASPS

Integrated Pest Management in and around the Home

Only a few of the very large number of wasp species in California live a social life; these species are referred to as social wasps. Some social wasps are predators for most or all of the year and provide a great benefit by killing large numbers of plant-feeding insects and nuisance flies; others are exclusively scavengers. Wasps become a problem only when they threaten to sting humans. One of the most troublesome of the social wasps is the yellowjacket. Yellowjackets, especially ground- and cavity-nesting ones such as the western yellowjacket (Fig. 1), tend to defend their nests vigorously when disturbed. Defensive behavior increases as the season progresses and colony populations become larger while food becomes scarcer. In fall, foraging yellowjackets are primarily scavengers and they start to show up at picnics, barbecues, around garbage cans, at dishes of dog or cat food placed outside, and where ripe or over-ripe fruit are accessible. At certain times and places, the number of scavenger wasps can be quite large.

IDENTIFICATION AND LIFE CYCLE

In western states there are two distinct types of social wasps: yellowjackets and paper wasps. Yellowjackets are by far the most troublesome group. Paper wasps are much less defensive and rarely sting humans. They tend to shy away from human activity except when their nests are located near doors, windows, or other high traffic areas.

Nests of both yellowjacket and paper wasps typically are begun in spring by

a single queen who overwinters and becomes active when the weather warms. She emerges in late winter/early spring to feed and start a new nest. From spring to midsummer nests are in the growth phase, and the larvae require large amounts of protein. Workers forage mainly for protein at this time (usually in the form of other insects) and for some sugars. By late summer, however, the colonies grow more slowly or cease growth and require large amounts of sugar to maintain the queen and workers. So foraging wasps are particularly interested in sweet things at this time.

Normally, yellowjacket and paper wasp colonies only live one season. In very mild winters or in coastal California south of San Francisco, however, some yellowjacket colonies survive for several years and become quite large.

Yellowjackets

The term yellowjacket refers to a number of different species of wasps in the genera *Vespula* and *Dolichovespula* (family Vespidae). Included in this group of ground-nesting species are the western yellowjacket, *Vespula pensylvanica*, which is the most commonly encountered species and is sometimes called the "meat bee," and seven other species of *Vespula*. *Vespula vulgaris* is common in rotted tree stumps at higher elevations and *V. germanica* (the German yellowjacket) is becoming more common in many urban areas of California, where it frequently nests in houses. These wasps tend to be medium sized and black with jagged bands of bright yellow (or white in the case of the aerial-nesting



Figure 1. Western yellowjacket.

Dolichovespula [= *Vespula*] *maculata*) on the abdomen, and have a very short, narrow waist (the area where the thorax attaches to the abdomen).

Nests are commonly built in rodent burrows, but other protected cavities, like voids in walls and ceilings of houses, sometimes are selected as nesting sites. Colonies, which are begun each spring by a single reproductive female, can reach populations of between 1,500 and 15,000 individuals, depending on the species. The wasps build a nest of paper made from fibers scraped from wood mixed with saliva. It is built as multiple tiers of vertical cells, similar to nests of paper wasps, but enclosed by a paper envelope around the outside that usually contains a single entrance hole (Fig. 2). If the rodent hole is not spacious enough, yellowjackets will increase the size by moistening the soil and digging. Similar behavior inside a house



Figure 2. Yellowjacket nest in spring (top), summer (center), and early fall (bottom).

sometimes leads to a wet patch that develops into a hole in a wall or ceiling.

Immature yellowjackets are white, grublike larvae that become white pupae. The pupae develop adult coloring just before they emerge as adult wasps. Immatures are not normally seen unless the nest is torn open or a sudden loss of adult caretakers leads to an exodus of starving larvae.

Aerial-nesting yellowjackets, *Dolichovespula arenaria* and *D. maculata*, build paper nests that are attached to the eaves of a building or are hanging from the limb of a tree. The entrance is normally a hole at the bottom of the nest. These aerial nesters do not become scavengers at the end of the season, but they are extremely defensive when their nests are disturbed. Defending *D. arenaria* sometimes bite and/or sting, simultaneously. Wasp stingers have no barbs and can be used repeatedly, especially when the wasp gets inside

clothing. As with any stinging incident, it is best to leave the area of the nest site as quickly as possible if wasps start stinging.

Paper Wasps

Paper wasps such as *Polistes fuscatus*, *P. aurifer*, *P. apachus*, and *P. dominulus* are large (1 inch long), slender wasps with long legs and a distinct, slender waist (Fig. 3). Background colors vary, but most western species tend to be golden brown, or darker, with large patches of yellow or red. Preferring to live in or near orchards or vineyards, they hang their paper nests in protected areas, such as under eaves, in attics, or under tree branches or vines. Each nest hangs like an open umbrella from a pedicel (stalk) and has open cells that can be seen from beneath the nest (Fig. 4). White, legless, grublike larvae sometimes can be seen from below. Paper wasp nests rarely exceed the size of an outstretched hand and populations vary between 15 to 200 individuals. Most species are relatively unaggressive, but they can be a problem when they nest over doorways or in other areas of human activity, such as fruit trees.

Mud Daubers

Mud daubers are black and yellow, thread-waisted, solitary wasps that build a hard mud nest, usually on ceilings and walls, attended by a single female wasp. They belong to the family Sphecidae and are not social wasps but may be confused with them. They do not defend their nests and rarely sting. During winter, you can safely remove the nests without spraying.

INJURY OR DAMAGE

Concern about yellowjackets is based on their persistent, pugnacious behavior around food sources and their aggressive colony defense. Stinging behavior is usually encountered at nesting sites, but scavenging yellowjackets sometimes will sting if someone tries to swat them away from a potential food source. When scavenging at picnics or other outdoor meals,

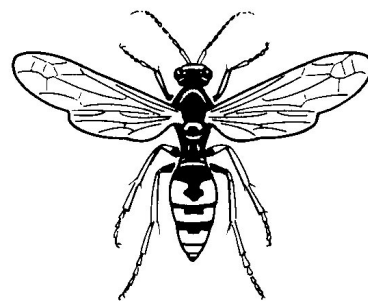


Figure 3. Paper wasp.

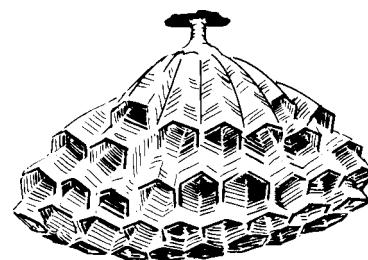


Figure 4. Paper wasp nest.

wasps will crawl into soda cans and cause stings on the lips, or inside the mouth or throat.

Responses to wasp stings vary from only short-term, intense sensations to substantial swelling and tenderness, some itching, or life-threatening allergic responses. All these reactions are discussed in detail in *Pest Notes: Bee and Wasp Stings* (see "References"). Of specific concern is a condition that results from multiple-sting encounters, sometimes unfamiliar to attending health professionals, that is induced by the volume of foreign protein injected and the tissue damage caused by destructive enzymes in wasp venom. Red blood cells and other tissues in the body become damaged; tissue debris and other breakdown products are carried to the kidneys, to be eliminated from the body. Too much debris and waste products can cause blockages in the kidneys, resulting in renal insuffi-

ciency or renal failure. Patients in this condition require medical intervention, even dialysis.

MANAGEMENT

Most social wasps provide an extremely beneficial service by eliminating large numbers of other pest insects through predation and should be protected and encouraged to nest in areas of little human or animal activity. Although many animals prey on social wasps (including birds, reptiles, amphibians, skunks, bears, raccoons, spiders, preying mantids, and bald-faced hornets), none provides satisfactory biological control in home situations.

The best way to prevent unpleasant encounters with social wasps is to avoid them. If you know where they are, try not to go near their nesting places. Wasps can become very defensive when their nest is disturbed. Be on the lookout for nests when outdoors. Wasps that are flying directly in and out of a single location are probably flying to and from their nest.

Scavenging wasps will not usually become a problem if there is no food around to attract them. When nuisance wasps are present in the outdoor environment, keep foods (including pet food) and drinks covered or inside the house and keep garbage in tightly sealed garbage cans. Once food is discovered by wasps, they will continue to hunt around that location long after the source has been removed.

If wasp nests must be eliminated, it is easiest and safest to call for professional help. In some areas of California, personnel from a local Mosquito and Vector Control District may be available to remove nests. To determine if this service is available in your area, call the California Mosquito and Vector Control Association at (916) 440-0826.

If a rapid solution to a severe yellowjacket problem is essential, seek the assistance of a professional pest control operator who can use microencapsulated baits to control these pests. Do-

it-yourself options include trapping wasps in a baited trap designed for that purpose, early-season removal of nests, or spraying the nest or nesting site with an insecticide labeled for that use.

Trapping Wasps

Trapping wasps is an ongoing effort that needs to be initiated in spring and continued into summer and fall, especially when the yellowjacket population was large the previous year. In spring there is a 30- to 45-day period when new queens first emerge before they build nests. Trapping queens during this period has the potential to provide an overall reduction in the yellowjacket population for the season, and a study is currently underway to test this theory in some California Mosquito and Vector Control districts (see "Online References"). The more traps put out in spring on an area-wide basis to trap queens, the greater the likelihood of reducing nests later in the summer. Usually one trap per acre is adequate in spring for depletion trapping of queens; in fall, more traps may be necessary to trap scavenging wasps, depending on the size of the population. There are two types of wasp traps: lure and water traps.

Lure Traps. Lure traps are available for purchase at many retail stores that sell pest control supplies and are easiest to use. They work best as queen traps in late winter and spring. In summer and fall they may assist in reducing localized foraging workers, but they do not eliminate large populations. Lure traps contain a chemical that attracts yellowjackets into the traps, but common lures such as heptyl butyrate are not equally attractive to all species. Proteins such as lunchmeat can be added as an attractant and are believed to improve catches.

During spring, baited lure traps should have the chemical bait changed every 6 to 8 weeks. In summer, change the bait every 2 to 4 weeks; change bait more frequently when temperatures are high. Meats must be replaced more

frequently because yellowjackets are not attracted to rotting meat. Also, periodically check the trap to remove trapped yellowjackets and make sure workers are still attracted to the trap.

Water Traps. Water traps are generally homemade and consist of a 5-gallon bucket, string, and protein bait (turkey ham, fish, or liver works well; do not use cat food because it may repel the yellowjackets after a few days). The bucket is filled with soapy water and the protein bait is suspended 1 to 2 inches above the water. (The use of a wide mesh screen over the bucket will help prevent other animals from reaching and consuming the bait.) After the yellowjacket removes the protein, it flies down and becomes trapped in the water and drowns. Like the lure trap, these traps also work best as queen traps in late winter to early spring. In summer and fall they may assist in reducing localized foraging workers but usually not to acceptable levels. Place them away from patio or picnic areas so wasps aren't attracted to your food as well.

Discouraging or Eliminating Nests

Early in the season, knocking down newly started paper wasp nests will simply cause the founding female to go elsewhere to start again or to join a neighboring nest as a worker. As there is little activity around wasp nests when they are first starting, they are very hard to find. Wasps are more likely to be noticed later after nests and populations grow. Nest removal for controlling subterranean or cavity-dwelling yellowjackets is not practical because the nests are underground or otherwise inaccessible.

Nest Sprays

Aerosol formulations of insecticides on the market labeled for use on wasp and hornet nests can be effective against both yellowjackets and paper wasps, but they must be used with extreme caution. Wasps will attack applicators when sensing a poison applied to their nests, and even the freeze-type prod-

ucts are not guaranteed to stop all wasps that come flying out. It is prudent to wear protective clothing that covers the whole body, including gloves and a veil over the face. In addition, you need to wear protective eyewear and other clothing to protect yourself from pesticide hazards. Wasps are most likely to be in the nest at night. But even after dark and using formulations that shoot an insecticide stream up to 20 feet, stinging incidents are likely. Underground nests can be quite a distance from the visible entrance and the spray may not get back far enough to hit the wasps. Partially

intoxicated, agitated wasps are likely to be encountered at some distance from the nest entrance, even on the day following an insecticidal treatment. Hiring a pest control professional will reduce risks to you and your family; in some areas of California, this service may be available through your local Mosquito and Vector Control District.

REFERENCES

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Online References

California Mosquito and Vector Control Web site (www.sac-yolomvcd.com) for information on yellowjacket control

For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

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To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

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WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash nor pour pesticides down sink or toilet. Either use the pesticide according to the label or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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