YELLOWJACKETS AND OTHER SOCIAL WASPS

Integrated Pest Management for Home Gardeners and Landscape Professionals

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. In California, yellowjackets are the primary pests among the social wasps.

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, especially ground- and cavity-nesting ones such as the western yellowjacket (Fig. 1), which 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 and barbecues, around garbage cans, at dishes of dog or cat food placed outside, and where ripe or overripe fruit are accessible. At certain times and places, the number of scavenger wasps can be quite large.

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 (Fig. 2) 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 to early spring to feed and start a new nest. From spring to midsummer nests are in the growth phase, and the larvae require

Figure 1. Western yellowjacket.

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 live only 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, *V. pensylvanica*, which is the most commonly encountered species and is sometimes called the "meat bee," and seven other species of *Vespula*. *V. 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 *D. (formerly known as V.) maculata*—on the

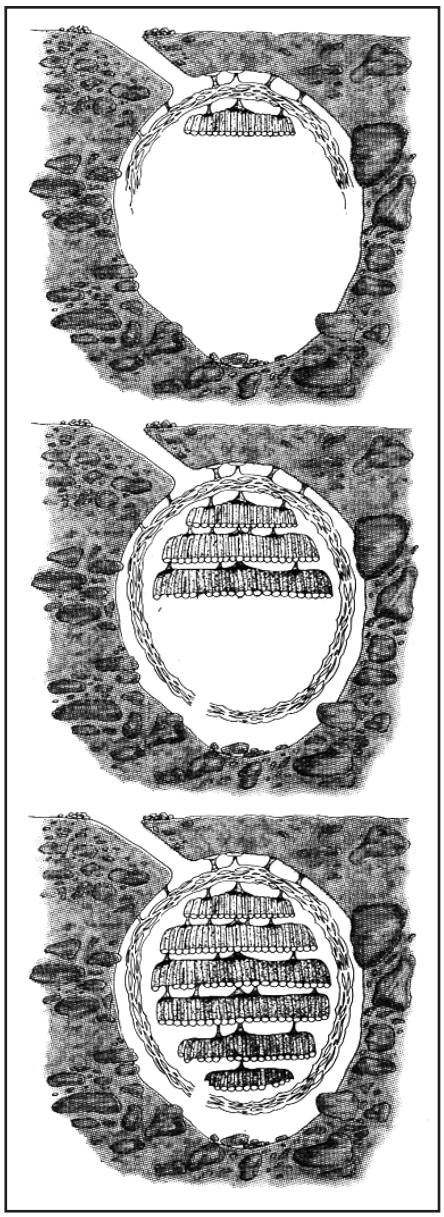

Figure 2. Yellowjacket nest in an underground rodent burrow in spring (top), summer (center), and early fall (bottom). The nest becomes larger during the summer as yellowjackets add new comb layers, each containing developing larvae. The colony declines in late fall when workers die off.

PEST NOTES Publication 7450

University of California
Statewide Integrated Pest Management Program
Agriculture and Natural Resources

May 2011

abdomen and have a very short, narrow "waist," the area where the thorax attaches to the abdomen.

Yellowjackets commonly build nests in rodent burrows, but they sometimes select other protected cavities, such as voids in walls and ceilings of houses, 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. If the rodent hole isn't spacious enough, yellowjackets will increase the size by moistening the soil and digging. Similar behavior inside a house 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 normally aren't seen unless the nest is torn open or a sudden loss of adult caretakers leads to an exodus of starving larvae.

Aerial-nesting yellowjackets, *D. arenaria* and *D. maculata*, build paper nests that they attach to the eaves of a building or that hang from the limb of a tree. The entrance normally is a hole at the bottom of the nest. These aerial nesters don't 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 aurifer, P. apachus,* and *P. dominulus* are 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 (Fig. 5) 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 aren't social wasps but might be confused with them. They don't defend their nests and rarely sting. During winter, you can safely remove the nests without spraying.

INJURY AND DAMAGE

Concern about yellowjackets is based on their persistent, pugnacious behavior around food sources and their aggressive defense of their colony. Stinging behavior usually is 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, wasps will crawl into soda cans and can sting your lips or the inside of your mouth or throat.

Reactions to wasp stings vary from only short-term, intense sensations to substantial swelling and tenderness, some itching, or life-threatening allergic responses. 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, and 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 insufficiency or renal failure. Patients in this condition require medical intervention, which can include dialysis.

Figure 3. Paper wasp.

Figure 4. Paper wasp nest.

Figure 5. Mud dauber.

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, praying 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 usually won't become a problem if there is no food around to attract them. When nuisance wasps are present outdoors, keep foods including pet food and drinks covered or inside the house, and keep garbage in tightly sealed garbage cans. Once wasps discover food, 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 might be available to remove nests. To determine if this service is available in your area, call the Mosquito & Vector Control Association of California at (916) 440-0826. If a rapid solution to a severe yellowjacket problem is essential, seek the assistance of a professional pest control operator or consider installing bait stations.

Trapping Wasps

Trapping is one method that can be employed to try to reduce yellowjacket problems. Trapping is not suggested for other social wasp species. To be successful, trapping must be an ongoing effort 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 Suggested Reading.)

The more traps put out in spring on an areawide 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 might 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 (Fig. 6) are available for purchase at many retail stores that sell pest control supplies and are the easiest to use. They work best as queen traps in late winter and spring. In summer and fall they might assist in reducing localized foraging workers, but they don't eliminate large populations. Lure traps contain a chemical that attracts yellowjackets into the traps, but common lures such as heptyl butyrate aren't 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 aren't attracted to rotting meat. Also, periodically check the trap to remove trapped yellowjackets and make sure workers still are attracted to the trap.

Water traps. Water traps generally are homemade and consist of a 5-gallon bucket, string, and protein bait such as turkey, ham, fish, or liver. Fill the bucket with soapy water, and suspend the protein bait 1 to 2 inches above the water. 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 might 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.

Figure 6. Yellowjacket lure trap.

Bait Stations

Yellowjackets are susceptible to rapid population reductions with poison baits later in the season when their prey no longer is available and some wasp species turn to scavenging. Fairly recently, a product called Onslaught became available to the public for reducing or eliminating scavenging wasp problems. The active ingredient in the product is microencapsulated esfenvalerate, which can't be detected by foraging wasps or nest mates that share the food. It must be used in commercially available bait traps labeled for this use.

The product, sold as the Alpine Yellowjacket Bait Station Kit, includes a multiyear supply of insecticide and four reusable, plastic bait stations. The bait stations look like oversized, plastic prescription vials with a hole in the side and a string for hanging. The kit is expensive, but for outdoor events such as cookouts, fairs, weddings, and receptions, it is worth the money. Currently this product is available only on the Internet.

To use the product, mix about 1/4 teaspoon of the insecticide into about 12 ounces of a slow-drying and attractive

wasp bait, such as canned, fish-based cat food, following the label directions. Protein baits are best, because they reduce the chances that bees will be attracted to the bait. Wasps visiting the bait station will carry poisoned bait back to the nest to feed the colony. Often, the wasp population is reduced to practically nothing in two days.

Caution: It is against the law to put pesticides, including insecticidal wasp baits, into used food containers. The last thing you would want is for someone to accidentally eat or drink your poisoned bait. Also, bait stations should be out of reach of dogs, cats, and other meat-eating animals.

Discouraging/Eliminating Nests

Early in the season, knocking down newly started paper wasp nests simply will 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 difficult to find. Wasps are more likely to be noticed later after nests and populations grow. Nest removal for controlling subterranean or cavity-dwelling yellowjackets isn't 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 products aren't guaranteed to stop all wasps that come flying out. It is prudent to wear protective clothing that covers the entire body, including gloves and a veil over your 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 might 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 might be available through your local mosquito and vector control district.

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SUGGESTED READING

Sacramento-Yolo Mosquito & Vector Control District, www.fightthebite.net. ❖

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ILLUSTRATIONS: Figs. 1, 3, and 5–6, J. K. Clark; **Fig. 2**, A. L. Antonelli from *Yellowjackets and Paper Wasps.* Pullman: Wash. State Univ. Bul. EB 0643.; and **Fig. 4**, L. L. Strand.

University of California scientists and other qualified professionals have anonymously peer reviewed this publication for technical accuracy. The ANR Associate Editor for Urban Pest Management managed this review process.

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.

This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.

Produced by **UC Statewide Integrated Pest Management Program**
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