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Yellowjackets, hornets and paper wasps

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What You Should Know

• Yellowjackets, hornets and wasps are closely-related social wasps commonly found in Utah.

• All social wasps are capable of repeatedly stinging without dying if they feel threatened.

• Bees are often blamed for most stings, but about 90% of all stings are likely caused by yellowjackets.

• Most social wasps are predatory of other insects and considered beneficial.

• Although providing natural insect control, social wasps can be considered nuisance pests when near humans.

Social wasps, including yellowjackets, hornets and paper wasps, are common stinging insects in Utah (Figs. 1, 2). The wasps are related to ants and bees, which are also capable of stinging; however, yellowjackets are the most likely to sting. Less than 1% of people are allergic to wasp or bee stings; however, some people are fatally stung every year. Nearly 80% of all serious venom-related deaths occur within one hour of the sting. Most people will only experience a mild local reaction with redness, pain, swelling and itching at the sting site. If symptoms are more serious, a physician should be consulted. Some people may develop venom sensitivity after repeated stinging episodes over a short or long period of time.

Fig. 1. Yellowjacket.[1]

Fig. 2. Baldfaced hornet.[2]

Social Wasp General Description

• Have three well-separated body regions, a distinct waist and two pairs of clear wings.

• Care for their young and develop a caste system with different forms living together.

• Regenerate a new nest every year because only the queen overwinters; honey bee colonies overwinter together every year.

• Create their nests out of a wood and saliva paste.

• Capture prey with their legs and jaws and use stinging for defensive purposes only; this is different than solitary wasps that subdue prey with stinging (e.g., spider wasp).

• Go through complete metamorphosis (i.e., egg, larva, pupa, adult); adults and larvae have chewing mouthparts, and larvae are legless.

• Capable of multiple stings because they have "smooth" stingers; bees have barbed stingers (Fig. 3)

Fig. 3. Honey bee (left) and wasp (right) stingers.

Yellowjackets

There are at least five different species of yellowjackets in Utah, but the most commonly found is the western yellowjacket, *Vespula pennsylvanica* (Fig. 4). Adults are smooth with yellow and black bands of color. The queen is about 3/4″ long, and the workers are about 1/2″ long. In general, yellowjackets are stout, big-bodied wasps. Yellowjackets can be easily distinguished from bees because they have relatively few body hairs and a distinct waist.

Yellowjackets tend to be be more aggressive than other social wasps and bees. Adults will defend the colony without much provocation and sting if threatened. Yellowjackets are especially aggressive during the day when searching for food.

Every spring, yellowjacket queens start a new colony. Queens prefer to build underground nests and will take advantage of abandoned rodent burrows (Figs. 5, 6). Sometimes queens will start a nest in a wall void or empty roof space. The queen only cares for the first brood and then depends on the workers to build new paper cells and search for food. Colonies can quickly build up to over 10,000 members in just one summer.

Yellowjackets are considered scavenger insects, and will eat almost anything, including: dead insects, carrion and garbage (Fig. 7). Adults are highly attracted to sugar in fruits, soda cans and candy, and will seek out items rich in carbohydrates. Adults will seek out protein to bring back to the nest and feed growing larvae.

In some years, yellowjackets will attack ripening fruit. Commonly damaged fruits include grapes, apples, pears and tomatoes. Pick fruits as soon as they ripen to reduce damage. Dispose of any dropped fruitst o minimize the number of yellowjackets in an area.

Always try to avoid unnecessary stings, especially if family members are allergic, by minimizing potential contact with yellowjackets. Cover or eliminate garbage and other food sources. Never swing or strike at yellowjackets since quick movements often provoke attack and painful stings. Take care not to disturb underground nests when maintaining the lawn if possible. Never throw rocks or spray water into nests or attempt to burn nests. These actions could initiate a stinging swarm or cause unforeseen damage to the property.

Fig. 4. Western yellowjacket.[1]

Fig. 5. Common yellowjacket nest opening.[1]

Fig. 6. Underground yellowjacket nest revealed.[1]

Fig. 7. Example of scavenging yellowjackets.[1]

Hornets

There are at least four species of hornets in Utah, and the most common is the baldfaced hornet, *Dolichovespula maculata* (Figs. 8, 9). The baldfaced hornet is actually not a true hornet, but is an aerial-nesting yellowjacket. Adults look very similar to yellowjackets, and are smooth with black and yellow or white bands of color. The queen is about 3/4″ long, and the workers are about 1/2″ long.

Hornets are more docile than yellowjackets and will rarely sting unless repeatedly threatened near the nest. Overwintering queens build new aerial nests every spring. Like yellowjackets, workers will increase the nest size with papery cells and feed larvae. Nests are generally attached to trees or bushes, but they can also be found on structures. Sometimes hornet nests can be found under eaves and other building overhangs.

The paper cells are enclosed in a grey, papery covering (Figs. 10, 11). Hornet colonies can quickly build up over the summer, with nests getting bigger than a basketball! The nest is composed of 3 or 4 tiers of combs within a thick, multilayered outer shell. A single opening at the bottom allows the hornets to fly in and out.

Hornets are considered beneficial predators of other insects, and will bring back food for growing larvae. Sometimes hornets are attracted to ripening fruit and can cause damage (Fig. 12). Dispose of any fallen fruits on the ground to minimize hornets in an area.

Nests that are high in the trees should be left alone. Nest removal should be considered when located near human activity. In general, removing small nests in the spring is easier than moving full-size nests in the late summer. Chemical control of hornets is potentially dangerous and should be carefully considered. Wear long-sleeved shirts and pants and avoid holding a flashlight directly at the nest. The most effective control is achieved by applying insecticide directly into the nest opening at dusk (when most colony members are in the nest). Some insecticides are pressurized and can be applied up to 20 feet away from the nest. After an application, quickly move away from the nest. Do not attempt to burn a hornet nest because it is extremely hazardous and environmentally unsound.

Fig. 8. Baldfaced hornet.

Fig. 9. Baldfaced hornet.[1]

Figs. 10 and 11. Examples of hornet nests.[1,3]

Fig. 12. Example of hornets scavenging fruit.[1]

Paper Wasps

There are at least four species of paper wasps in Utah. The most common native species is the western paper wasp, *Mischocyttarus flavitarsus*; however, the European paper wasp, *Polistes dominulus*, is quickly becoming the dominant species. The European paper wasp is a recently introduced wasp in the United States

Adults are more slender than yellowjackets or hornets and often have long legs dangling during flight. The queen is about 3/4″ long, and the workers are about 1/2″ long. Paper wasps have a very distinct waist and appear smooth or hairless. Paper wasps are typically dark brown, orange or red in color, or can be banded with yellow and black (Figs. 13-15). Adults can be confused with yellowjackets.

Paper wasps build open-cell nests in protected areas (Fig. 16). The open cells are not covered with a papery envelope like with hornets. Most paper wasps are not aggressive and will not easily sting. Like yellowjackets and hornets, paper wasps start a new colony every year. Overwintering queens will start new nests on almost any structure or small cavity, including trees, rocks, wood, playground equipment, and buildings (Fig. 17).

Paper wasps are considered predators of other insects. Workers will collect caterpillars and other immature insects to feed the colony. Sometimes paper wasps will seek out sugar and occasionally damage ripening fruit.

Removing paper wasp nests is not necessary unless they are near human activity. Repairing foundation cracks and sealing holes will deter queens from starting a new colony. Reducing queens and small nests early in the spring will prevent large colonies from building up.

Fig. 13. European paper wasp starting a nest.[4]

Fig. 14. Paper wasp.[1]

Fig. 15. Paper wasp.[5]

Fig. 16. Example of a Western paper wasp nest.[1]

Fig. 17. Example of a paper wasp nest.[1]

Allergic Reaction Symptoms

Normal Reaction: the sting site is initially painful, red, swollen and itchy; however these symptoms will quickly go away after a day.

Large Local Reaction: the sting site has persistent pain for several days, including in the surrounding areas.

Severe Allergic Reaction: the entire body is involved and begins (5-30 minutes) after the sting occurs. People may feel dizzy (lightheaded), nauseated, weak with possible stomach cramps and diarrhea. Often reactions include itching around the eyes, a warm feeling or coughing, hives breaking out, followed with vomiting and swelling. There can be wheezing, shortness of breath, hoarse speech, drop in blood pressure, shock, and unconsciousness.

For people with a normal sting reaction, the following treatments may be useful:

* Ice
* Baking Soda
* Ammonia Solution (1-2.5% solution)
* Oral Antihistamines
* Epinephrine Inhaler
* Topical Steroids
* Local Anesthetics
* Oral Steroids (prescription only)

Reduce Your Risk

Some yellowjackets and hornets are scavengers as well as predators of live insects. Others are attracted to sugary foods or soda cans in garbage containers. These local populations can be reduced by frequently removing waste and maintaining tight lids on all trash receptacles.

Remove hornet and paper wasp nests in early spring to prevent large nesting colonies in the summer. Nest removal is dangerous because social wasps can get aggressive when disturbed, especially when their nest is threatened. Remove nests at night when most colony members are inside the nest and less likely to sting.

Try using attractant traps to lure in social wasps, especially near garbage cans. Wasp traps can be effective in reducing scavengers for garbage. But the pheromones are generally made for yellowjackets and will not attract hornets or papers unless specifically labeled.

Chemical Control

Essentially the same chemicals are registered in Utah for all social wasp control. There are nearly 450 products registered in Utah, with about two-thirds of them intended for homeowner use. Disturb the nest as little as possible when applying insecticides and remove nests after dark when the insects are less active or inside their nests. When treating social wasp nests, there is always a chance of being stung. For this reason, persons that are not willing to take the risk of being stung should use a professional pest control operator. The use of beekeeping protective clothing (a veil, long gloves, and coveralls tied at the wrists and ankles) is also advisable when treating nests. This is particularly true for large nests that are located in areas where the applicator cannot escape to shelter after applying the insecticide, as some insects may escape the treatment and pursue the applicator. Some products contain pressurized liquids that direct a spray of pesticide (up to 20 feet in a long, fine jet) at the nest site, so the applicator can remain at a safe distance.

Pressurized liquid formulations of insecticides intended for control of yellowjackets, hornets and paper wasps contain allethrin, benzylcarbinyl propionate plus eugenol, chlorpyrifos, cyfluthrin, cypermethrin, D-phenothrin, diazinon, dichlorvos, esfenvalerate, linalool, permethrin, prallethrin, propoxur, pyriproxyfen, resmethrin, synergized pyrethrins, tetramethrin, and tralomethrin.

Dust formulations for soil treatments can be used to control ground-nesting yellowjackets. Active ingredients in these formulations include bendiocarb, cyfluthrin, deltamethrin, diazinon, permethrin, synergized pyrethrins, and silica gel.

Products containing a rapidly volatilizing organic solvent mixed with synergized pyrethrins or with D-phenothrin plus D-trans-allethrin (synthetic pyrethroids) are available in some areas. This type of formulation quickly freezes the wasps and coats them with an insecticide. In the case of aggressive species this can be very useful. Prodcuts include CB Wasp & Hornet Jet Freeze by Waterbury, Wasp-Away by Check-Mark, Pres Treat Brand Wasp Freeze Wasp and Hornet Killer Formula 1 by Whitmire Microgen, and PT 515 Wasp-Freeze by Whitmire Microgen.

[1] Images courtesy of Whitney Cranshaw, Colorado State University Extension (www.ipmimages.org).

[2] Image courtesy of Edward L. Manigault, Clemson University (www.ipmimages.org).

[3] Image courtesy of Jerry A. Payne, USDA ARS (www.ipmimages.org).

[4] Image courtesy of Ellen Levy Finch (en.wikipedia.org/wiki/Image:WaspBuildingNest_wb.jpg).

[5] Image courtesy of Lynette Schimming (bugguide.net/node/view/27045).