

TWO MOST-COMMON YELLOWJACKET WASPS IN WYOMING DIFFER IN

PESTINESS

Aerial yellowjacket more mellow, western yellowjacket just plain grouchy



Aerial Yellowjacket

Scott Schell

The bold, contrasting color patterns on yellowjacket wasps act as a warning to potential predators they pack a potent sting.

The 11 species of yellowjacket wasps (subfamily Vespinae, in the order Hymenoptera) in Wyoming all exhibit this warning, or more accurately, aposematic color pattern. Unlike honey bee workers, which can only sting once at the cost of their lives with barbed stingers, yellowjacket females can sting repeatedly with their smooth stingers. Yellowjackets will do so readily if physically assaulted or in defense of their nests.

Their color pattern is so effective at deterring predators that defenseless insect species, such as the flower fly species (order Diptera, family Syrphidae) have evolved color patterns that closely mimic yellowjackets for protection. Like honey bees, yellowjackets are an eusocial insect, which means related individuals work cooperatively to produce the next generation.

Yellowjackets, and their close relatives the paper wasps (subfamily Polistinae), use the original version of papier-mâché to construct their nests. The “paper” these wasps make consists of fibers they chew off plant stems and weathered wood mixed with their sticky saliva. The design and placement nests vary by species.

As with many other insect pest species, proper identification of the perpetrator and a working knowledge of their life cycles can help you implement the best control methods.

Western and Aerial Yellowjackets

The two most common species of yellowjackets in Wyoming towns have different nesting preferences. The western yellowjacket (*Vespula pensylvanica*) prefers to nest underground, frequently taking over and enlarging abandoned rodent burrows as their nests get bigger (Photo 1). They will also readily use crawl spaces and cavities in or under human structures.

Aerial yellowjackets (*Dolichovespula arenaria*) prefer the shelter of overhangs such as the eaves of houses or under the branches of trees for their paper-covered nests (Photo 2).

Knowing the life cycles of these yellowjacket species is a key to their control if they become pests. The life cycle of both is very similar. A new queen emerges from her natal nest in the late summer and mates with a male yellowjacket (males are produced in the summer for the sole purpose of mating with the new queens and then they die off). This often occurs at congregations of wasps on hilltops within sight of the nests. During mating, a new queen is able to store all the sperm she needs for the rest her life. She will then forage for food through late summer and seek a protected place to spend the winter alone. Locations such as under loose bark on dead trees, in firewood piles, and in building attics are often used as a hibernation refuge.

If a queen chooses her winter quarters well and survives, she becomes active again when the weather warms the following spring. The young queen will forage for food and search for a suitable place to build her nest and start her own colony.

The new nest starts small and consists of a single tier of hexagonal paper cells for rearing the initial brood



Photo 1. The entrance to an underground yellowjacket nest by a brick wall shows the soil removed by worker wasps as they excavate the cavity to expand the paper nest.



Photo 2. The overhangs on buildings make great nest sites for aerial yellowjackets. Their nest construction differs from the yellow and black European paper wasp by having a cover of paper over the larval cells.

of daughters and a paper cover to protect them with a single entrance at the bottom. A single fertilized egg is put in each cell. The sex of her offspring is determined by the queen. If she releases some of the stored sperm, it fertilizes the egg and the egg will develop into a female wasp. Unfertilized eggs, with only the genes from their mother, develop into male wasps. This ability to control the gender of offspring genetically is called haplodiploidy.

After the first eggs hatch, the queen has to forage to feed these first few daughters herself. If she

dies while doing this, they all die.

When the yellowjacket larvae are fully grown, the queen caps the larva's cell with paper. They pupate and undergo metamorphosis into the adult winged form. When these first daughters emerge, they take over the work of defending and expanding the nest, foraging for food, and caring for the subsequent offspring of their mother. The adult daughters are inhibited from producing their own eggs by a pheromone scent emitted by the queen.

Their Habits

Aerial yellowjacket nests are the most frequently noticed kind in Wyoming, with their penchant for putting gray-colored, paper-covered nests under the eaves of buildings. None of the yellowjacket species reuse a nest from the previous year, but a good location may attract a new nest every year.

Aerial yellowjackets are primarily predators of other insects and prefer prey such as caterpillars. The prey are chewed into a “baby food” consistency and fed to the developing larvae.

Western yellowjackets are frequent scavengers of meat from road-killed animals. They also like to forage in uncovered human garbage and chew the remains of dead insects off the front of cars. They can also be beneficial as opportunistic predators of plant-feeding insects. Western yellowjacket adults will also feed on sweets, such as ripening fruit, for energy. All yellowjacket colonies, if successful, continue to expand with more workers being produced until the queen starts to produce the next generation of queens and the males to mate with them.

In studies conducted in Washington State, the populations of worker yellowjackets per nest varied widely with species and the year’s particular environmental conditions, especially the early spring weather. Western yellowjacket colonies were found to have anywhere from 900 to almost 4,000 workers by late summer in areas with lots of food resources. Aerial yellowjacket colonies were similar in size. After the production of males and new queens, nest expansion ceases and the first hard frost is the end of life for the old queen and her worker daughters.



Photo 3. The pattern of black markings on the head and top of the abdomen differs between species of yellowjackets. This drawing illustrates the typical markings on a worker western yellowjacket. From “The Yellowjackets of America North of Mexico.”

Because the aerial yellowjacket so closely resembles the more pestiferous ground-dwelling western yellowjacket, probably more cans of “wasp” spray is expended on their exposed nests than any other species in Wyoming. This usually doesn’t solve people’s problems with yellowjackets. Western yellowjackets are much more likely to be the pest in your yard. One study found that worker western yellowjackets would forage as far as 1,100 feet from their

The USDA Agriculture Handbook Number 552 “The Yellowjackets of America North of Mexico” is a comprehensive treatise on these fascinating insects and is available for download at bit.ly/wyoyellowjackets

nest. However, all yellowjacket species only travel as far as needed to find food.

Unwelcome Outdoor Visitor

The western yellowjacket is also the species that most frequently interrupts outdoor dining at picnics and was found to inflict 9 out of 10 insect stings people suffer according to a study conducted in Colorado. Despite being a predator on some insects considered garden plant pests, the negatives of western yellowjackets, such as attacks on honey bee hives, feeding on ripening fruits in orchards and gardens, scavenging at picnics due to their attraction to people food, and drinking from both fermented and sweet beverage containers, can outweigh their benefits.

They readily sting in defense of their underground nest entrances. These behaviors make the species deserving of control around homes and farms.

The best way to reduce western yellowjacket populations around a home is to start trapping early in the spring to catch the new queens and/or the first daughters to eliminate or stunt new colonies. Commercial traps baited with heptyl butyrate, which smells like rotting fruit, are very effective against the western yellowjacket. Other bait ingredients may enhance the trap catches, but heptyl butyrate used alone is very effective for catching western yellowjackets.

Later in the spring and summer, refresh the bait and move the traps to the outer edge of your yard to intercept foraging western yellowjackets coming from nests from beyond your yard. The pattern of black on yellow on the head and abdomen can be used to distinguish the western yellowjacket (Photo 3).

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