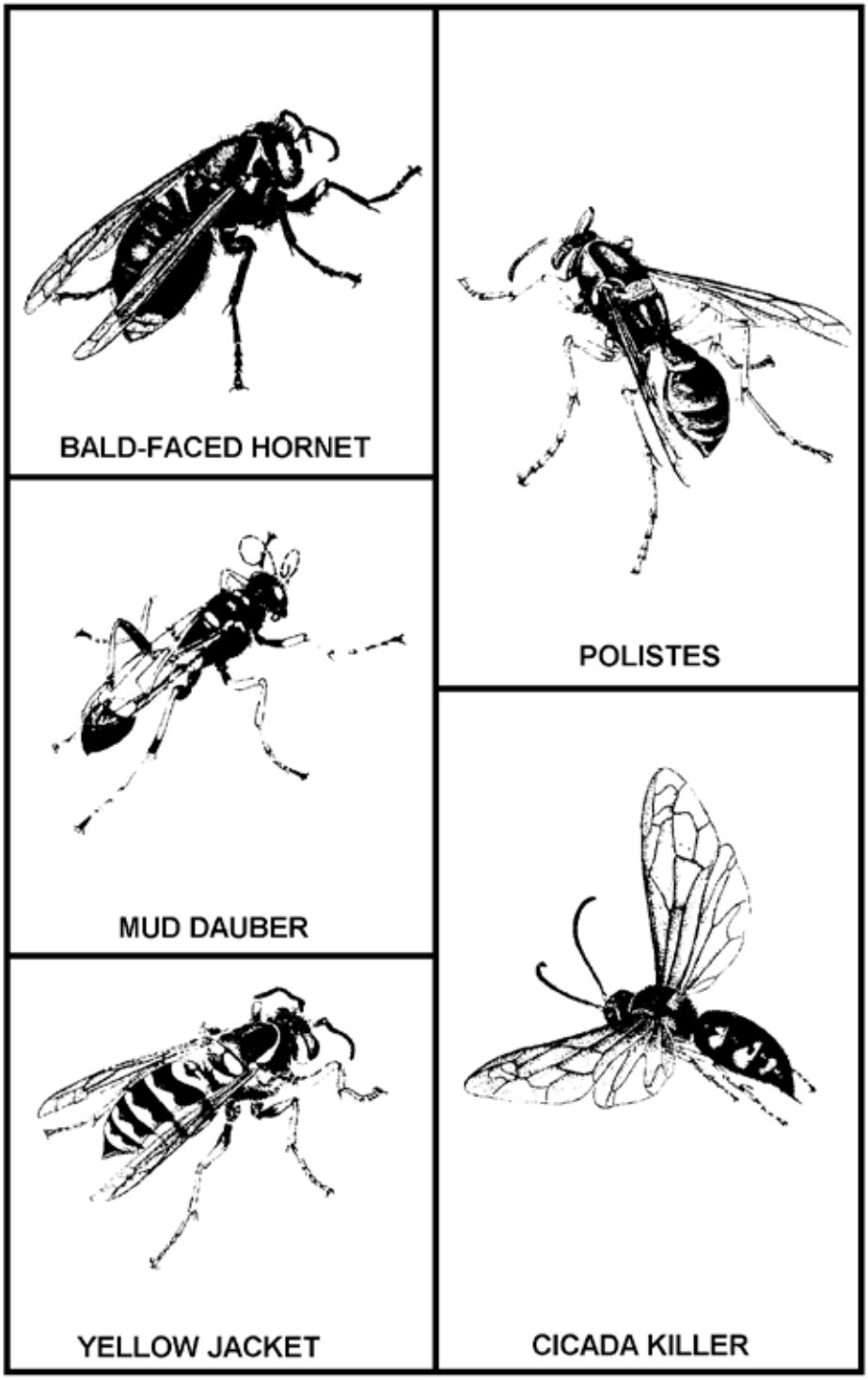
CHAPTER 21

THE BEST CONTROL FOR BEES, YELLOW-JACKETS, HORNETS AND WASPS ...

Bee-ware!

FIVE STINGING PESTS



http://www.lib.uiowa.edu/hardin/md/insectpictures.html
http://www.aaaai.org/patients/topicofthemonth/0904/matching.stm

PEST OVERVIEW AND GENERAL DESCRIPTION

The insects considered most beneficial to humans are found in the large insect order Hymenoptera. About one-third of the human diet is derived in some way from bee pollinated crops. Honey has antibacterial properties. Not only are the bees and many of their relatives pollinators of flowering plants, including fruits and vegetables, but thousands of species of small wasps are parasites of other arthropods including pest insects and bee venom has longeen known to soothe arthritis. Without these parasites that limit the growth of insect populations, pests would overtake most of our crops. **Volatile, synthetic pesticide poisons are not species specific. They kill everything, including all the beneficial insects - and maybe you, your family and pets.** Sanitation is the real key.

The urban pests of the order Hymenoptera are the stinging insects. Although the first image to come to mind implies danger to humans, these yellow jackets, hornets, and wasps sometimes serve our interest: they feed their young largely on flies, spiders and/or caterpillars. But, in 1990, 32,662 small animals in the U. S. required a trip to the vet after being stung by bees or wasps. In 1988, the Federal Center for Disease Control in Atlanta reported 34 human fatalities due to known wasp or bee stings. About 500,000 U. S. citizens enter the emergency room every year because of allergic reactions to venomous insect stings. The majority of stinging victims suffer normal reactions to the venom, such as pain and swelling. A smaller number of people will be hypersensitive to the venom and can suffer a fatal anaphylactic shock reaction.

Many of these stinging insects are social. They live in colonies with a caste system or a division of labor and overlapping generations - all offspring of one individual reproductive. Some of these colonies persist: for many years (ants, honey bees) and others, like stinging wasps, start anew each year.

WASPS, YELLOWJACKETS AND HORNETS

In parts of the United States, particularly in the eastern states, yellowjackets, wasps, hornets and bees are all called “bees” by the general public. Of course the general public is principally focused on one attribute these insects have in common - their stingers. If stung, try a little hydrated bentonite clay or some fresh squeezed onion juice or a meat tenderizer paste and/or see **The Blood Feeders Overview.**

Knowledge of the behavior of these pests is essential to their management; effective communication with frightened or, at best, fearful occupants is an important skill you must develop. Nests of stinging pests are usually the target for control. Understanding nesting and the make-up of the colony is essential to be effective.

NESTS AND COLONIES

Yellow jackets, hornets and paper wasps are all in the same insect family, Vespidae. The common paper wasp with its umbrella shaped nest or single comb best demonstrates the basic building pattern of a colony.

CLASS - Insecta

ORDER - Hymenoptera

FAMILY - Various

TYPE METAMORPHOSIS - Complete

Introduction - Bees, hornets, yellowjackets and wasps are for the most part a very beneficial group of insects, being the major pollinators of flowering plants, including all of our fruit and vegetables, and they are also predators of many insect pest species, etc. However, each year in the U. S. people are killed by stinging insects. There is an old German proverb, "God made the bee but the Devil made the wasp."

Bees, yellowjackets, hornets and wasps can be described as either solitary or social. Solitary species live independently of each other. Social species live together in colonies or nests that have a caste system or an adult division of labor composed of workers, queen(s) and (periodically) males.

The most common solitary groups include the carpenter bees, cicada killers, digger wasps, mud daubers, potter and mason wasps, spider wasps and velvet ants. The most common social groups include the bumble bees, honey bees, hornets, paper and umbrella wasps and yellowjackets.

Identification - It is necessary to know which specific group of bees, yellowjackets, hornets or wasps you are encountering. Recognition of whether they are solitary or social, and their particular nesting habits is essential to correctly determine the potential harm or danger they may cause you and the occupants of the area.

Biology - Bees, yellowjackets, hornets and wasps all go through complete metamorphosis: egg, larva, pupa and adult. Those which are social have a caste system composed of workers, queen(s) and males (drones). Although the workers are sterile females, they occasionally lay eggs or can sometimes assume reproductive functions if the queen dies. Except for the paper and umbrella wasps, most colonies contain only their founding queen until mid-summer when many queens and males are produced, but honey bees have only one functional queen at any given time. With the onset of cold weather, workers, non-inseminated queens and males die off leaving the inseminated queens to over-winter and start new colonies in the spring. Honey bees are the exception where the entire colony including immature, workers and the queen over-winters. In the solitary bees and wasps, only the inseminated queen over-winters.

Adults of social species feed on nectar, honeydew, sap, fruit juices, etc. Protein for bee larvae comes from pollen, but for the wasps and hornets it consists of insects and spiders if the adults are predators, or meat if they are scavengers. Workers get some protein but mostly carbohydrates from the trophallactic fluid exuded by the larvae when fed by the workers. The larvae of solitary species get all their food from the paralyzed prey or pollen ball which is usually sealed in a cell with the single egg.

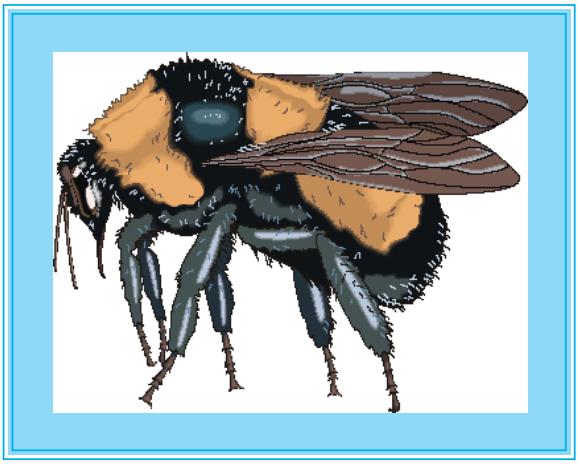
Initial Intelligent Pest Management® Control Notes - Try to avoid being stung and keep all garbage cleaned up and tightly covered. Avoid indiscriminate killing of even wasps, hornets and yellowjackets - they are beneficial pollinators and predators on pest insects. If picnicking, keep food properly covered and sealed. Avoid areas where yellowjackets are prevalent. Keep overripe fruit and vegetables cleaned up and stored away from human activity. You should caulk all cracks and crevices during the winter or early spring to prevent stinging insects from gaining access to the building, **but never caulk the opening of an active nest - it will force them indoors!**

HOW TO AVOID BEING STUNG: Bee-Ware!

1. Do not cook or eat or drink outdoors during yellowjacket season.
2. Do not wear light blue, yellow, and/or brightly colored and patterned clothes or bright (flashy) jewelry.
3. Do not wear scented talcs, perfumes, colognes and other scents, including scented hair spray, suntan lotion, sunscreen, cosmetics, deodorants and shaving lotions.
4. Do not sit down on or handle wet towels, washcloths or clothes without first checking to make sure no yellow jackets are drinking the moisture.
5. Do not carry sugary or meat snacks in open containers.
6. Do not drink soft drinks from open containers. Use a glass or a lid and/or a straw.
7. Do not hit or swat at bees or yellowjackets. Squashing a yellowjacket can release a chemical pheromone (alarm) that signals other wasps and yellowjackets in the area to come attack you. Yellowjackets will not usually sting or bite a person at rest, if they or their nest have not been disturbed or threatened by a person's swatting or by the quick movement of their arms or legs. They may land on your skin to inspect a smell or even to get water if you are sweating heavily, but they will leave of their own accord if you stay calm and do not move quickly. If you lack the patience, you can brush them off gently

with a piece of paper as long as you move slowly and deliberately.
8. Do not walk directly into the flight paths of these stinging insects.
9. Do not go barefoot, especially through vegetation.
10. Do not shine a flashlight or cast a shadow on the nest at night.
11. If a bee or wasp enters your moving car, pull off to the side of the road and stop, if possible; open the windows and safely let it fly out and leave by itself.
12. Wear proper safety protection, not only during treatment/control but also during inspections.
13. Wear gloves when picking up rocks, timbers and firewood. Use a rake to move debris and mulch.
14. Don't vibrate, hit, move, touch or make any unnecessary movements around the nest.
15. Activities, e.g., running, screaming, and flailing only agitates wasps and bees.
16. **Final Note: If you have any sensitivity to insect stings, you should never attempt any control activity. Bee-Careful!** Use Safe Solutions Insect Repellent.

General Control Notes - Since bees, yellowjackets, hornets and wasps are all considered to be beneficial insects, control should **only** be done where there is an imminent threat to people or their pets. These insects can (when provoked) inflict a painful, venomous sting and/or bite. Some people are so sensitive to the venom's complex amino acids, proteins and enzymes they develop severe allergic reactions known as anaphylaxis and may even die without an injection of an antidote. **Africanized bees can and do kill normal people during an attack frenzy that can include hundreds of stings.** Remove or cover all garbage, dropped fruit, soft drinks, pet food and other protein and sugar food sources. Routinely clean all dumpsters, garbage cans and spills, then spray with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint* and/or borax. If you spray stinging insects with diluted Safe Solutions, Inc. enzyme cleaners with peppermint (1 oz. per qt. water), they generally die within 6 - 35 seconds, or simply vacuum them up. Diluted enzyme cleaners with peppermint will kill them all virtually on contact and also have a "fumigant" action. Put 1½ gallons of this mix in a rechargeable 2½-gal. stainless steel fire extinguisher and pump up the pressure to 100# and you have the best sprayer you have ever used to control stinging insects.



BEES AND WASPS

ORDER - Hymenoptera

FAMILY - Apidae (honeybee), Xylocopidae (carpenter bee), Bombidae (bumble bees) Vespidae (paper-nest and umbrella wasp)

TYPE METAMORPHOSIS - Complete

Egg - Eggs are laid singly in paper or wax cells or tunnels and cared for by female workers.

Larva - Larva are grub-like, legless, feed on food secured by female or workers.

Pupa - Transformation period between larval and adult stages. Resembles the adult, but paler in color and motionless.

Adult - Fertile males and females and sterile workers.

TYPE MOUTHPARTS

Chewing-Lapping - (Carpenter bee and paper and umbrella wasps)

Sucking - (Honeybee)

Danger Aspects - If provoked, even the *gentle* Italian honeybee will sting in groups [especially the Africanized honeybee] and can kill a man. Even one sting can cause severe reactions (especially in sensitized individuals) ranging from nausea, fainting, coma and even death. **Often people have more accidents and suffer more**

harm trying to avoid contact with these pests than the insects could ever cause; some people have an unreasonable fear of all stinging insects. Stay calm!

LENGTH OF LIFE CYCLE - There are more than 20,000 species of bees!

Bumblebee and Carpenter Bee - About one year.

Honeybee - Workers - from 1 to 6 months; Queen - from 3 to 5 years

Paper and Umbrella Wasps - One season, with new fertile males and females overwintering in areas protected from cold.

SPECIFIC DESCRIPTIONS

Bumble Bees - Bumble bees are of the family Bombidae, subfamily Bombinae, in the genus *Bombus* with approximately 200 species. Bumble bee nests are annual and do not last from one year to the next and are usually found in the ground, usually under a tuft of grass or other plant. Bumble bees can also be located in old rodent burrows, abandoned bird or rodent nests found in attics, wall voids, old buildings and/or in old stuffed furniture or mattresses left outside or stored in outbuildings and/or even dryer vents. At first the queen is alone in the nest; then she produces a dozen or so workers to take over the job of gathering pollen and nectar so she can lay new broods. It usually takes 3 weeks or more to develop from egg to adult. The adults can sting you repeatedly and have pulled objects almost 300 times their own weight. By late August there may be hundreds of workers, males and new queens. After fertilization the new queens look for winter *hibernation* sites.

Control - Find the nest and vacuum and/or flood with diluted Safe Solutions Enzyme Cleaner with Peppermint or Not Nice to Bugs®* or dust with food-grade DE at night when all the bees are home. Remember though, they are extremely beneficial and can travel to 20 - 30 blossoms per minute gathering nectar, in a day's time she can pollinate hundreds and hundreds of plants. They are more efficient pollinators than honey bees. Nectar from a single blossom gives her enough energy for about a minute flight. They do produce small amounts of honey, but it is not fit for human consumption. Scientists have determined it is mathematically impossible for her to fly, but apparently no one told her. Bumble bees can sting more than once and their stings are extremely painful. Ground nests can be "fumigated" with carbon dioxide or carbon monoxide.

CARPENTER BEES
Xylocopa Spp.
Family Anthophoridae

Carpenter bees get their name from the galleries they bore into wood to bear their young.

Adult - From 1/4" to 1" in length, they are attractive looking bees with a shiny black, blue-black, green or purple metallic sheen. They closely resemble bumble bees; except that the abdomen of the carpenter bees are usually bare and are more flattened. The female makes the nest in unfinished wood and the male helps protect it even though he is unable to sting. In the fall, dust the holes, then caulk or fill all holes and then seal, paint and/or stain all unpainted, exposed and/or weathered wood outside.

Burrowing usually starts at the bottom or underside of a **weathered and unpainted timber** and then extends straight in for an inch or so. The tunnel then turns sharply at a right angle usually following the grain of the wood and may extend 10 feet deep into the wood. Normally the circular tunnel is only 4" - 12" long and is the same diameter as the female's body. It takes the female about six days to burrow one inch. After the tunnel is completed, the female places a mixture of pollen at the end of the tunnel and lays an egg on it. She then seals the first cell and makes a second cell above it. This continues until between 6 to 8 cells have been made. She

generally waits until her brood emerges and then all of them clean out the nest chamber. The original female generally does not survive the winter but normally one of her own young will return to the old nest, keeping it and then laying her own eggs in it. Carpenter bees are considered to be solitary pests and the young can return to over-winter in the abandoned tunnels. Carpenter bees sometimes get so drunk on fermented nectar they fall to the ground.

Larva - Grub-like in appearance, feeds on the honey pollen mixture placed in cell by the female. Takes about 15 days to mature.

Pupa - The stage of transformation from larva to adult. The pupa resembles the adult but is usually paler in color and motionless. Pupal stage lasts about 15 days.

Egg - Laid by the female in galleries made in wood on top of a pollen-honey paste. Takes about two days to hatch.

SUMMARY

Carpenter Bees are not social insects - they are solitary insects; they live only one year. The most common (eastern) carpenter bee, *Xlocopa virginica* (Linnaeus), is distributed throughout the eastern half of North America. This bee is a large insect with a hairy yellow thorax and a shiny black abdomen. Superficially, it resembles yellow and black female bumble bees, which are social and more closely related to honey bees. Valley Carpenter bees, *Xylocopa varipucta (Patton)* and Mountain Carpenter bees, *Xylocopa orpifex (Smith)*, are large, shiny, sometimes metallic, and are also shaped like bumble bees, and found in the Western U. S. and lower California.

Carpenter bees bore or chew 1/2" holes in wood and make a long tunnel provisioned with pollen and eggs. They prefer to enter unpainted wood and commonly tunnel in redwood and unpainted deck timber. They will also bore into painted wood especially if any type of start hole is present. New females reuse old tunnels year after year; they are also attracted to areas where other females are tunneling. Egg laying and tunnel excavation occurs in the spring. Males hover around the tunnel entrance to "guard" it while the female provisions the nest and lays her eggs.

Males dart at intruders belligerently but they can do no harm; they have no stingers. Since these bees are not social, there is no worker caste to protect the nest. Stings of females are rare, unless provoked.

New adults emerge after the middle of summer and can be seen feeding at flowers until they seek overwintering sites, sometimes in the tunnels.

Habitat Alteration and Control

Carpenter bees drill into the end grain of unfinished structural wood or into the face of a wooden member, then turn and tunnel with the grain. Fill holes with wood putty or caulk and the paint or stain or varnish exposed unprotected wood. Oil-based enamels work best. Spray the nest/wood with Not Nice to Bugs® or diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint* - it kills on contact and has the ability to penetrate the wood/gallery with a "fumigant" action. Caulk the hole with silicone caulk, dowels or wood putty and paint the wood. Dust each hole with a residual material, e.g., non-volatile borax, talcum powder, boric acid or food-grade DE or silica aerogel or fill the entire cavity with an aerosol foam insulation. Force some of the dust down into the gallery and/or put some dust on steel wool or copper gauze and stuff this *plug* into the entrance of the tunnel. Wait 2 days, then securely seal off all openings with caulk, wood putty or a wooden dowel and paint or seal all the wood. **If you are careful, a tennis racquet is an extremely effective "cure", if bees are in swatting range, and if you watch out for angry females.** (A dusted plug stops new adults who otherwise would emerge through shallow caulking.) Caution should be taken, especially if you are working on a ladder and if you are not experienced with these rather harmless bees. Remember, only the females can sting if provoked - Bee-ware! **See Chapter 36 also on Wood Destroying Organisms.**

HONEY BEE
***Apis mellifera* (Linnaeus)**, Family Apidae

"If the bee diasppeared off the surface of the globe, then man would only have four years left to live." — Albert Einstein Ripley described the honey bee as "fearfully and wonderfully made." It has 5 eyes and 5,000 nostrils and each big eye has 7,000 tiny eyes. Its wings vibrate at the rate of 11,400 times a minute. It travels a distance of 50,000 miles - twice the circumference of the earth - before it can gather one pound of honey. In its lifetime a single honey bee collects enough nectar to make 1.5 oz. (45g) of honey. The average bee visits thousands of flowers each day. It may take 32 million flower visits to make one quart of honey. Its sting is operated by 22 muscles. It can only sting once. A honey bee can carry 300 times its own weight. A busy colony will gather 15 lbs. (7 kg) of nectar every day in summer. Thick sweet honey forms when moisture evaporates from the nectary. It is totally deaf and colorblind to red flowers. The only bee that survives the act of stinging is the queen bee. Her life span is 50 times that of the ordinary worker. The bee has never been domesticated, as it does not depend on man for its food supply. Honey bees only eat nectar and pollen and foods they make from honey and pollen. Bees carry the nectar in a pouch called the honey stomach. Pollen is carried in pollen pouches on the back legs. It is literally a "walkie-talkie." It communicates with other bees in the hive by crawling. If it encounters an enemy, an obstacle or a new food supply, it will walk up the vertical surface of the honeycomb in an intricate waggle. The other bees understand the language of the waggle and take measures to deal with the situation. Honey bees shiver their wing muscles even though their wings are kept still in order to create heat to warm the hive. The hexagonal cells of the hive are geometrically so perfect that the celebrated French physicist, Réaumur, has suggested their adoption as an ideal unit of measure, superior to any other. Honey bees make wax inside their bodies and the wax comes out of wax glands in the bees' abdomens; each cell tilts up so the honey won't spill out. When they build upside-down cells, they are for the new queen bees. Some Brazilian bees produce sour honey. Many European beekeepers think so highly of their bees that a death in the family is publicly communicated to the hive. In the Spanish Pyrenees a drop of black ink is splashed upon each bee to enable the insects to share in family mourning. Statistics from the Centers for Disease Control show that during a 10-year period there were an estimated 20,000 - 50,000 honey bee stings. While 3% of the U. S. public is allergic to bee stings and as many as 50 people may die each year - bee stings are currently being used to treat people with arthritis and M. S. During World War II a Ripley reader reported the capture of a bee with the number 29 marked on its abdomen. He dubbed it "Natures B-29." The oldest picture available to mankind was found by Ripley's "Believe It or Not" in a Spanish cave. There, in prehistoric days, a cave man carved a scene showing a hunter in the act of capturing a swarm of bees. "The first B picture."

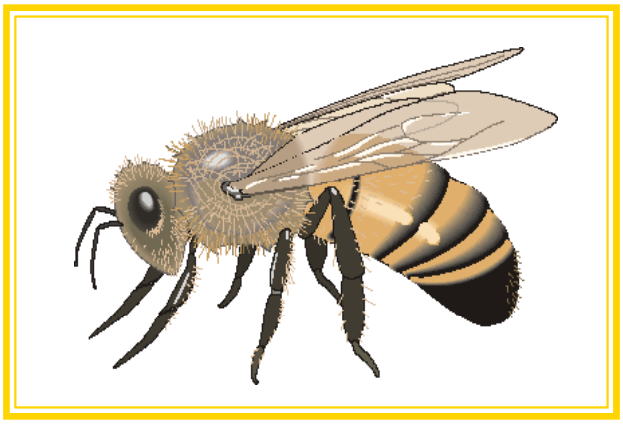
The honey bee was introduced into the United States in Colonial America. Honey bees are highly social insects and communicate with each other, relaying direction and distance of nectar and pollen sources. Bees make combs of waxen cells placed side by side that provide spaces to rear young and to store honey. The bee colony lives on the stored honey (the only food that will not spoil) throughout winters and, therefore, can persist for years.

When colony populations are high, the queen may move part of the colony to new harborage. Generally, they prefer large elevated holes or cavities in trees, caves, animal burrows or any void in a building. Bees abscond (or swarm) at this time, usually finding hollow trees or logs to begin their new colony, but they occasionally work their way into building wall voids. Human-made hives are built of straw, pottery or wood. If a honey bee nest in a hollow tree or log must be destroyed, you can do so at night with a red light and carefully fill the entire cavity with aerosol foam insulation. A colony of Eurpean bees allowed to reproduce and survive will have 3 colonies at the end of a year.

A honey bee colony in a house wall can cause major problems. The bees can chew through the wall and fly inside. Their storage of large amounts of honey invites other bees and wasps. Their detritus, e.g., dead bees, shed larval skins, wax caps from combs and other material) attracts dermisted beetles and moths. When a bee colony is found in a building wall, it can be vacuumed up and/or trapped using the technique described in this manual and/or controlled in the same way as controlling yellowjackets in wall voids. Listen to the bee noise from inside rooms to locate the exact position of the nest in the wall to assure that the whole colony is controlled.

After you are sure all of the honey bee colony is gone, remove the entire nest. If the nest is not removed, the wax combs - normally cooled by the bees - will melt and allow honey to flow down through the walls. Honey stain can never be removed; the walls will have to be replaced. The freed honey also attracts robber bees and wasps. The comb wax will attract wax moths that may persist for several years. The dead bees attract carpet beetles. Only after the colony is gone can the entrance hole be caulked or repaired to prevent further bee infestation.

Honey bees get their name from the sweet yellow to brown fluid they produce from flower nectar to use as food. They not only provide us with honey and bees wax but are our major pollinators. Human babies under one year old should not eat honey. The entire nest overwinters. Check with County Extension Agent for name of a beekeeper who will remove the bees for a fee or in the case of a swarm, usually for the bees themselves. Tracheal (*Acarapis woodi*) mites that lay eggs in the tracheal tubes of honey bees causing difficult breathing and death and (*Varroa jacobsoni*) mites that parasitize honey bee pupae have been killing honey bees since the 1980's. Essential Oils including menthol, cinnamon, eucalypus, spearmint, wintergreen, thyme and camphor (as well as vegetable shortening) are being reviewed for apicultural use to control tracheal mites. Folic acid, formic acid and lactic acid are being reviewed for apidcultural use to control varroa mites. Try lightly mixing natural or essential oils, e.g., clove, pennyroyal, wintergreen, peppermint or spearmint oils with hamburger and sugar and placing this inside the nest to eradicate the mites. Formic acid or essential oils that often contain one or more monoterpenoid compounds, or menthol and/or neem extracts in sugar water have also been used to control these mites. Only menthol is registered for control. You can also lightly spray 10% neem oil directly on the bees. Honey bees have other natural enemies who try to steal their honey, including Pooh and other bears, wasps and bees from other hives. Smoke has been used for centuries to calm bees down. They can fly at speeds up to 15 mph.



DESCRIPTION

Worker - Sterile females - about 1/2" - 5/8" long, off-yellow, intermixed with black, gray or brown with 2 pairs of wings, covered by hair, fat and blunt looking. Often seen gathering pollen and nectar. It is the job of the honey bee worker to care for and defend the threatened nest; to create the honey and beeswax and, most importantly, to fertilize our plants. An injured honey bee gives off a pheromone scent/alarm that quickly causes the other honey bees to fly around furiously looking for the cause. In protecting their nests, the workers sting (anywhere from 1 to 50 stings are typical when you disturb their nest.) with a barbed stinger; once your skin has been penetrated, the stinger, the poison sac and parts of the honey bee's abdomen are all torn off, killing the bee. The reflex action of the muscles still attached to the barbed stinger drive it deeper and deeper into your flesh, discharging more and more poison. For this reason alone, the barbed stinger should be very quickly and carefully removed from the victim. In addition, the stinger gives off an odor or pheromone that attracts even more angry workers, which creates even further alarm and subsequent bee attacks. So quickly remove the stinger by scraping with a credit card, knife or fingernail. **Do not rub, pinch or scratch the area, but wash it with soap and water and apply an antiseptic and cold compress. Seek medical attention. Death can occur within 15 - 30 minutes, especially in allergic or sensitive people.** In the 4th century B.C. Aristotle recorded in his Historia Animalium "On each expedition the bee does not fly from the flower of one kind to the flower of another, but flies from one violet, say, to another violet and never meddles with another flower until it has got back to the hive." An 18th century Irishman, Arthur Dobbs was the first to use this information - and became the first person to observe and clearly describe insect pollination and its importance.

Queen (fertile female) - larger than the worker (5/8" - 3/4"), has a long, pointed body; her function is to lay eggs. There is usually only one queen per hive, because one will usually quickly kill the others as soon as she emerges from her cell. Queens are created by feeding ordinary female larvae royal jelly. All the bees in the hive are her children. She keeps them in line, working for the hive with a pheromone the workers get by licking her; the pheromone is called queen substance. She is fed by workers mouth to mouth.

Male - Also called a drone, is broader and blunter than the worker. They make more noise when they fly and their only job is to fertilize queen after which they and are then destroyed or driven out of the hive by the workers. Usually drones do not mate with the queen from their own colony.

Larva - Cared for by the workers. Legless, grub-like insect.

Pupa -Transformation period in which the larva changes to an adult. Spins a cocoon within its cell in which to pupate.

Egg - (laid in individual waxed cells - fertilized) become sterile female workers and queens; (unfertilized) develop into the males (drones).

Swarm - A colony of bees looking for a new hive/home.

INTELLIGENT PEST MANAGEMENT® CONTROL NOTES - Swarms of honey bees that are inside inaccessible areas cannot EASILY be removed by a beekeeper. If a swarm is on an **open bush** or tree limb it can easily be removed by a beekeeper and saved in a box. The swarm will remain there for up to 2 days as they look for a permanent home. If you must kill it or suspect they may be Africanized honey bees - the swarm may be destroyed by thoroughly drenching the bees with a 2% fatty acid solution (dish soap or detergent in water) or by using diluted Safe Solutions Enzyme Cleaner with Peppermint* or by dusting the entire cavity with food-grade DE at night using a red light.

Stinging Insects Nesting in the Wall of a Building - Continuous stinging insects, e.g., honey bees, flight activity to and from a hole in a building indicates there is a colony of bees inside. Often the bees can also be heard buzzing in some interior location. Tape the tip of the sucking end of the vacuum near the hole at night and then turn on during the day if it is not raining; put talcum powder or corn starch in the bag first or use a rinse-and-vac with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint in the tank; let it run all day and shut off only when dark.

Physically removing living colonies of honey bees from inside a building is a complex task because they usually live between walls or tucked away where they are impossible to reach. Call a beekeeper and see if he/she will try to help you remove the colony of bees.

Warning: Simply killing the bees inside your building's walls with a synthetic pesticide poison can have serious consequences: First, all poisons are dangerous not only to bees but to you, and, second, the nest may contain 7,000 - 80,000 members. Dead bees may form a deep, moist pile which promotes decay and stinks and draws secondary pests. Dead bee larvae produce equally offensive odors. In the absence of live bees, stored honey will absorb moisture and ferment and/or overheat. This results in melted or burst wax cappings, and the freed honey will flow into and/or down ceilings or walls, causing stains or sticky puddles. At a minimum, the old honey will act as an attractant to new swarms which can quickly reinfest the nest area. You can also be invaded subsequently by dermestid beetles.

The quickest way to remove the bees is to kill them with 1 tablespoon of dish soap and 1 teaspoon of vegetable oil and/or 1 oz. Safe Solutions, Inc. Enzyme Cleaner with Peppermint* in 1 quart of water, or simply vacuum them all up and then clean out and remove the nest, wax and honey and then carefully fill in or caulk the whole hive area. If a nest/colony inside an inner wall, ceiling or outer wall must be removed, the services of a building contractor may be required. Remember, it is essential to remove all of the old honey bees and honeycomb and then to securely caulk all openings to be certain there is no access to old nest area. Even remaining bits of beeswax emit an odor which is highly attractive to swarming bees. After cleaning, fill in the entire area with an aerosol insulation foam.

A much slower method of removal may be used if there is no urgency involved and especially if it is desired to protect the bees and not dismantle the building. This method is based on the principle of a one-way exit - bees which leave the building cannot return inside. However, the bees will cluster in a large mass around the exit, so an elaborate set-up is generally used to gather and then transfer the (clustering) bees to a new hive. Experienced beekeepers can do the job best, as they are used to bees flying around them and even are used to being stung occasionally. If you do it yourself, follow these steps.
From a beekeeper, obtain a one-story hive containing one frame of unsealed brood covered with bees, one frame of honey and several frames of drawn comb or foundation to fill in the hive.

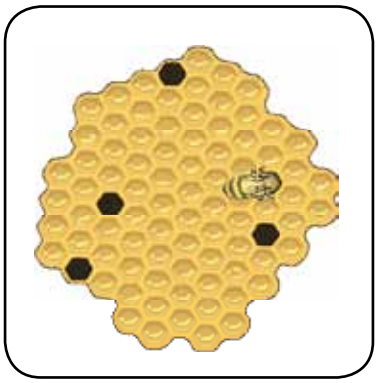
1. **Fold a piece of window screen** to make a cone wide enough at the base to completely cover the bees' entrance into your building. The cone's smaller opening (at the distal tip) should be about 3/8" in diameter and the cone should be bent slightly upward.

2. **Caulk, screen, and/or plug all other holes** where bees may enter the building.

3. **First properly protect yourself** with a commercial bee veil and hat, long sleeves and commercial bee gloves, use a bee smoker to smoke the bees' entrance to the building. Then fasten the large end of the screen cone tightly over the entrance.

4. **Position the one-story hive near the cone entrance,** e.g.., on brackets nailed to your building. Place some bee frames filled with brood and honey in the center of the hive; place some frames with the drawn comb or foundation at the sides. The one-story hive entrance should be reduced to about a 1" opening to protect the colony from being robbed by stronger colonies that may be in the area. Bees emerging from your building's screen cone will not be able to find their way back through the cone opening. Instead, they will enter the new hive near their old entrance and become re-established there. As *your* bees leave your building and move into their new hive, your old colony will grow weaker and soon will be unable to maintain/defend itself.

5. About 4 weeks later, simply remove the screen cone. Honey bees from the new hive should then enter the building and "rob" (transfer) all of the honey in your building into the new hive. The old queen in your building often will be killed or lost in this process. If the old queen is lost, a new queen must be provided if the bees did not produce one from the brood supplied in the one-story hive. Hopefully all the remaining bees will move to the hive, leaving only the empty wax comb in the building. Old nesting sits are extremely attractive to new swarms, so after the bees have moved completely fill in the nest with foam and caulk all 1/4" or larger holes and cracks to prevent another swarm for entering. If possible, remove even the wax in your building so as not to attract other honey bee swarms and other insect pests. **Return the hive with bees and honey to the beekeeper.**



In the residential or school situation, it may be desirable to discourage foraging bees from even flying around your building. This is especially true if small children or allergic people are present. Discouragement of bees consists of the removal of (or preventing access to) any sugar, food or water which may attract them, such as soda cans, flowers, water dishes, etc. We highly recommend all flowering vegetation be located far away from doorways, decks, sidewalks, mailboxes and other areas frequented by people. Also, lawns should be kept free of white clover and flowering weeds and/or plants.

Note: Apidae (bees, honey, royal jelly and/or mead) have all been used throughout the world as aphrodisiacs to increase sexual vigor and/or attractiveness, enlarge male and/or female genitalia, to increase sexual pleasure and sperm potency and to increase fertility.

Honey Bee Final Note: Many beekeepers may not allow you to bring wild bees into their apiary because they may be infected with bee diseases such as "American Foulbrood". If you must kill the honey bees, use only diluted Safe Solutions Enzyme Cleaner with Peppermint*, vacuums, soapy water or those aerosols or other chemical poisons that are specifically labeled for bee control and then follow the directions very carefully. Honey bees in the USA pollinate more than 90 crops; their pollination is worth more than $14 billion annually.

AFRICANIZED HONEY BEES OR KILLER BEES

Apis mellifera scutellata - Lepeletier (formerly identified as *Apis melliferi adansonii)*

The Africanized bee is golden-brown and black, looks like and is the same species as the European honey bee kept by beekeepers all over the United States, but it is a little smaller and weighs a little less. There are very minor genetic differences between Africanized and European honey bees. Introduced into Rio Claro, Brazil from southern Africa, in 1956 by the geneticist Warwick Kerr; 26 swarms escaped and began to expand their new territorial range, it is adapted to longer warm seasons than are northern honey bees. On October 15, 1990 the bees crossed the U. S. border near Weslaco, Texas. They are now well established from Texas to southern California and have been found in Arkansas, Arizona and Florida.

It is thought that this bee will advance as far into the northern temperate region as it has into the southern temperate region. If this is true, Africanized bees will eventually be distributed north in a line that will reach from southern Pennsylvania, west to Seattle, Washington. Each colony can become 30 - 33 colonies in a year.

Africanized bees do not store as much honey to take them through the winter as honey bees do - they are more concerned with reproduction than honey production. They have smaller colonies and tend to swarm or abscond or change locations more often. Smaller swarms allow colony development in smaller cavities at or near ground level. In South and Central America, Africanized swarms settle in hollow trees like northern honey bees; they also colonize in rubber tires, crates and boxes, wall voids, abandoned vehicles, subterranean cavities and other protected places or artificial structures that abound in urban areas. Worker bees are more aggressive in attacking and tend to mob intruders. The defensive zone of attack around Africanized honey bee nests is up to 100 feet away! People and pets have been killed causing this strain to be called killer bees. The urbanized Africanized honey bee presents a new management challenge not only to beekeepers but to all pest management technicians.

The Africanized honey bee is slowly migrating northward into the U. S. out of South America, initially through Central America and Mexico. The migration of this highly aggressive strain of honey bees has already or is expected to infest Texas, Arizona, Florida, New Mexico and California. Researchers believe that it will take at least five years after their arrival before they begin to overwhelm/destroy the native honey bee populations.

The main difference between Africanized honey bees and European honey bees is how they behave at the hive. Colony defense is their greatest difference. Tests repeatedly have demonstrated that Africanized honey bees become alert to disturbances more quickly, prepare for colony defense more quickly, usually sting at least ten times more than European honey bees, and tend to continue the attack for longer time and at much greater distances from the hive. They can “go off” and sting everything within a city block or an even greater area. Their poison is about 4 times more powerful than cobra poison. **Most attacks involve 200 - 300 stings, but can involve thousands of bees. A student in Costa Rica was stung over 8,000 times in an attack that lasted hours. Five hundred stings is life-threatening to most individuals. Colonies of Africanized bees will attack with little provocation;** in fact, even their swarms may attack. **They will pursue and sting you up to a full mile from their nest** while domestic bees will generally only pursue you up to 98 yards (run away in a zig-zag pattern). A healthy person can outrun attacking Africanized bees according to Costa Rican expert Dr. Ramirez - Benavides. Most attacks stop after sundown - so begin your control efforts then.

While Africanized bees quickly die when sprayed simply with 1 cup of dishwashing detergent in one gallon of water; diluted enzyme cleaner and/or peppermint soap and M-Peck insecticidal soaps; it is *illegal* in some states, e.g., California, to use any product against bees other than specific pesticide poisons *registered* for bee control - and nothing is registered for “homeowner use”.

Infants, chemically-sensitive people, elderly people and those with high blood pressure and weak hearts are at highest risk of death from Africanized honey bee stings. Small children are also more susceptible to their toxic venom. Serious injury or death can be prevented by taking precautions in those areas known to contain colonies of Africanized honey bees. **Observe the following precautions:**

1. Wear or at least take a commercial bee veil and hat with you. Numerous stings may be more tolerated elsewhere on the body, but your face and eyes must be completely protected. We recommend you use all of the protective clothing listed earlier. Use Safe Solutions Insect Repellent.

2. Determine in advance where to run and seek shelter if bees begin to sting. A vehicle or building with all windows closed will provide you with the best protection. Running or walking or trying to *hide* in the brush or among trees will not protect you.

3. If someone is stung and develops an allergic reaction to the venom, e.g., becomes unable to breathe, a shot of the drug epinephrine is all that can save them. **This medication must be administered immediately.** Before entering areas where there is a likelihood of encountering Africanized honey bees, consult with medical authorities for information on obtaining and using epinephrine and for all the known precautions and hazards associated with its use.

4. If you live where there are Africanized bees, eliminate potential nest sites: abandoned vehicles, empty containers, tires...anything with a hole. Inspect trees, fences and outbuildings regularly. Cover rain spouts, vents and other openings with 1/8" hardware cloth and caulk/seal all openings over 1/8".

WASP GENERAL DESCRIPTION

About 800 species of social wasps including hornets and paper wasps and yellowjackets are included in the family Vespidae, but all adult species are banded with yellow, green or orange on a black or brown background color. They are considered the most dangerous species of stinging hymenoptera. They all have stingers, they all build paper nests and form annual colonies. They all have short, heavy antennae and for the most part thick waists. They fold their wings lengthwise when at rest, making the wings seem only half as wide as they are. The common wasp has 5 eyes; 2 large ones on either side of its face and 3 on the top of its head that can only sense dark and light and are used by the wasp to help keep its balance. They are all considered to be social insects with both fertile and infertile females as well as males. Only the mated or fertile females overwinter protected in cracks of trees, attics or other secluded places. In spring these overwintering queens, called foundresses, begin constructing paper nests from chewed wood and other vegetation, which they chew into pulp; personal paper nests are then constructed in attics or under eaves, in wall voids, in shrubs and trees, in cavities in the ground and in lumber piles. These nests are begun by attaching a thick paper strand to an overhanging structure - then hollow paper cells are created by chewing wood or plant fibers (cellulose) mixed with water and shaped with their mouthparts until 6 or so cells are hanging together. Eggs are laid in the bottom of the cells and tended by the solitary, reproductive, female queen/worker. They range in length from 1/2" - 3/4". When these offspring become adults, the original female assumes the role of full time queen and then only lays eggs while younger females forage for food and enlarge the nest. Wasps fly like airplanes either straight or up; that is why they seldom get out of traps but continue to fly until they die. The word *polistes* comes from a Greek word meaning "founder of a city".

Larva - Grub-like, legless, with a very small head. The larvae live in open cells and are fed parts of insects, or scavenged meats, by the workers. When they start to pupate, the workers cover and seal off their cells.

Pupa - Resembles the adult but paler in color and motionless. The pupal stage takes place in an enclosed cell.

Egg - Laid by the queen and tended by the workers.

Note: Yellowjackets and hornets are similar in description to the umbrella wasps whose colonies may contain 250 members, but the yellowjacket and hornet colonies may number many thousands of individuals. They love our charcoal meat and chicken and soft drinks and can be trapped on glue fly strips "baited" with these meats. They do have a worker class and late in summer males and new queens are produced. After mating the males die as do the workers and original queen. The adults feed on fruit and sweet materials and the larvae are fed meat and other insects. If their nests can be found you can treat the aerial nesters with diluted peppermint soap and/or enzyme cleaner sprays directed into the opening or simply vacuum them up. If the nest is in the ground or

surrounded by walls, you may use dusts, e.g., talcum or medicated body powder. To find a nest, catch a wasp, cover it with flour, release it and follow it home. Often a shop vac with soapy water or high powered vacuum with talcum powder or cornstafrch in the bag can be used at night to suck up the creatures.

INTELLIGENT PEST MANAGEMENT® CONTROL - Because of their gathering habits during the day and the danger of their stings, the best time to remove a paper nest is at night when all wasps are back in or on the nest and it is cool. **CAUTION:** Use all necessary personal protection and vacuum up the wasps - be sure to put talcum powder or baking soda in the bag or spray them with dish detergent and water, or carbon dioxide fire extinguishers, or better yet, diluted enzyme cleaners/peppermint soaps. If you must use a synthetic pesticide poison, only use a pyrethrin aerosol on an extension pole to stun the wasps first. When applying an aerosol or 1 oz. Safe Solutions, Inc. Enzyme Cleaner with Peppermint per quart of water, try to force the spray through the entrance hole into the nest. Do not try burning a nest if the nest is in a tree or bush since this may not even kill all the newly enraged members; it may also cause serious damage to the plant. **Please read all of the IPM control strategies before beginning any control.**

SOLITARY WASPS

CICADA KILLER WASPS
Family: Sphecidae
***Sphecius speciosus* (Drury)**

Cicada killers are very large (1”-2” long). They have an abdomen colored black (or rusty) with yellowish or orange markings on the first 3 abdominal segments with yellow or orange wings - they are relatives of mud daubers, however they do not look like mud daubers and have an orange tint to their wings. Because of their size and coloration, they look like “monster” yellowjackets. This solitary wasp gets its name because it hunts and stocks each of its nesting cells with a paralyzed cicada to feed its developing young. They make 1/2” diameter holes in the bare ground up to 10” deep and 6” horizontally. A pile of soil often surrounds the entrance holes. There may be many holes in an area or around a building.

Intelligent Pest Management®
Cicada killers can be ignored by those who accept an explanation of their harmless nature. Each queen wasp, being a female, has a stinger; each can sting. In spite of their size and fierce looks, however, stings are extremely uncommon. The queens must be abused first or stepped on - males can not sting, but will buzz and angrily hover around the hole guarding it. The female paralyzes a cicada (or up to 3 cidads) with a sting and brings it back to a cell in the burrow and lays an egg on each cicada. There can be 16 or more cells in each burrow. The larva, when it hatches, feeds on the living cicada and then overwinters in the burrow, pupates in spring and emerges in summer as an adult. Usually seen in July - August when the cicadas that are used for food are most abundant. When there is undue worry about these huge wasps, open soil burrows can be vacuumed or plugged or dusted with talcum powder or food-grade DE individually or sprayed with Not Nice to Bugs®, diluted Safe Solutions Enzyme Cleaner with Peppermint*. Plant grass and/or use regular overhead irrigation.

Mud dauber wasps are not social wasps like paper wasps. They are in a different family, the Family Sphecidae. Many paralyze spiders to provision mud cells built to enclose victim, eggs, larvae and pupae. The mud cells form long clay tubes or large lumps. The wasps are very slender; they are shiny black or brown, orange or yellow, with black markings. Many have long slender thread waists.

Like carpenter bees there is no protective worker caste; these wasps are not aggressive; they will not sting unless pressed or handled. Mud daubers place their mud nests in protected places like eaves, under decks, garages, electric motors, sheds, attics, against house siding and under porch ceilings. So many wasps congregate at the same site to construct the mud nests that later removal of the nests and repainting is often expensive.

Habitat Alteration and Control

Mud daubers are easily controlled with a water hose and/or scrape away their mud nests, and cover problem

areas with a good quality smooth paint. Nesting should be discouraged on porticos and high porches of historically important buildings. Read Black Widow spider section before harming these creatures.

Solitary Wasp Overview

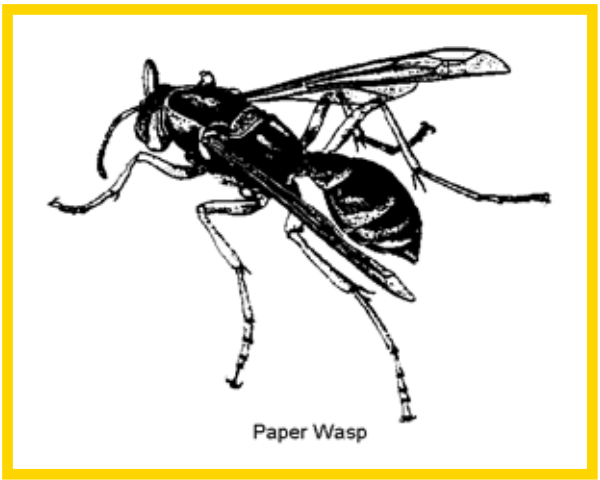
Solitary wasps, of the family Sphecidae, include several species of mud daubers that range in length from ½
" to over 1¼". Some of these wasps are distinctive, having the abdomen separated from the thorax by a long, slender waists or *petioles.* Solitary wasps are considered to be beneficial insects and are not usually aggressive towards man. One species, *Sceliphron caementarium.* is black and yellow, and another, *Chalybion californicum,* is dark metallic blue with blue wings. The Western cicada killer *Sphecius convalis* (Patton) looks and acts very similar to the cicada killer but its a little smaller (5/8" - 1-3/8" long.)

Mud daubers are named thus because female mud dauber wasps construct their nest cells of mud. They provision these with spiders or insects as larval food for their off-spring. When the cell is full, a single egg is deposited and the cell is sealed. An adult female usually assembles several cells together in one nest. Nests are located in protected places among trees and rocks in nature, but the wasps also construct them under eaves on the sides of buildings and in attics and other out-of-the-way areas.

Mud daubers are beneficial because they contribute to the control of spiders, including black widow spiders, around buildings and in attics. These wasps are usually few in number and are not aggressive like bees or yellow jackets. Their mud nests may occasionally attract carpet beetles.

Intelligent Pest Management® Guidelines for Solitary Wasps - Ignore them, but if you can not, educate everyone to the fact they do not really present any danger. Use a spatula, pole or broom or high pressure stream of water or diluted Safe Solutions, Inc. Enzyme Cleaner to dislodge mud nests from walls, ceilings or eaves.

PAPER WASPS OVERVIEW
Subfamily: Polistinae
Genera: *Polistes spp.*


Paper Wasp

Paper wasp queens, like other Vespid nest mothers, is the lone female reproductive, who begins her nest by attaching a thick paper strand to an overhanging structure or protective site. She then builds hollow paper cells by chewing wood or plant fibers (cellulose) mixed with water and shaped with her mouthparts. There are 27 species in North America that are considered semi-social.

When a half dozen cells or so are hanging together facing downward, the Queen lays an egg near the bottom of each one. The little white grubs that hatch from the egg glue their rear ends in the cell and begin receiving nourishment in the firm of chewed up bits of caterpillars provided by their mother. When they grow large enough to fill the cell cavity, they break the glued spot and hold on their own by their stuffed fat bodies, hanging head down.

These wasps are not normally agressive until you disturb their nests. The Euyropean paper wasp *(Polistes dominulus)* is far more agressive than our native paper wasp.

Mature larvae, then, spin silk caps, closing off the cell, and molt into pupae. This same larval behavior pattern is followed by yellow jackets and hornets also. All are females. Other than their white color, these Vespid pupae look like adults; they develop adult systems, then shed their pupal skins, chew through their silk cell cap, pump

out their wings, and take their place as worker assistants to their mother. (Paper wasp queens and workers are the same size; yellow jacket and hornet queens are larger than their daughters.)
From Spring on, the queen continually lays eggs and the daughter workers feed larvae and expand the comb or nest. Each nest can house a few to several dozen paper wasps. They do not eat the protein (insect) food they gather for the larvae but get their energy from flower nectar. Later in the season, some of the larvae develop into males and others will become next year's queens.

The new males and females mate with those of other colonies, and the fertilized females find hiding places under tree bark or in logs and wait out the winter until they can begin their new colony in the spring.

The male Vespids die in winter; likewise the original nest disintegrates and will not be used again.

INTELLIGENT PEST MANAGEMENT® AND CONTROL OF UMBRELLA OR PAPER WASPS (*Polistes spp.*)


Paper Wasp Nest

Paper wasps nests are often found near doorways and other human activity areas without occupants being stung. Colonies can become problems, but when they do, paper wasps can be controlled easily. **There can be up to 100 or more members by August.** When attracted to fallen ripe fruit, these wasps sting people who venture into the same area. Colonies in trees, out buildings, hollow fence posts and other protected places are not as easy to control as those from nests on structures. **Remember, they are beneficial insects that are predators of caterpillars, flies and other insects.**

Habitat Alteration

- Remove old nests and scrape the point of attachment. (This spot is often selected by new queens for attachment of new combs.) Safe Solutions, Inc. Enzyme Cleaner also digests nesting material as well as insects.
- Remove ripe fallen fruit and garbage as often as possible.
- Caulk openings in attics, window frames, and around wall penetrations to keep overwintering females out of unused rooms and spaces.

Intelligent Pest Management® Control

- Freeze them with dry ice, a carbon dioxide extinguisher or a 20# CO_2 canister with a probe.
- Vacuum up all exposed individuals (with 2 tablespoons of cornstarch in the bag) and/or spray with soapy water and/or diluted or Safe Solutions Enzyme Cleaner with Peppermint.
- Wear a bee suit, gloves and a veil. Proceed cautiously, especially if you must use a ladder.
- Spray them and their nests with Not Nice to Bugs® or simply spray them with soapy (or diluted enzyme cleaner) water which quickly renders them incapable of flight and causes them to literally drown.

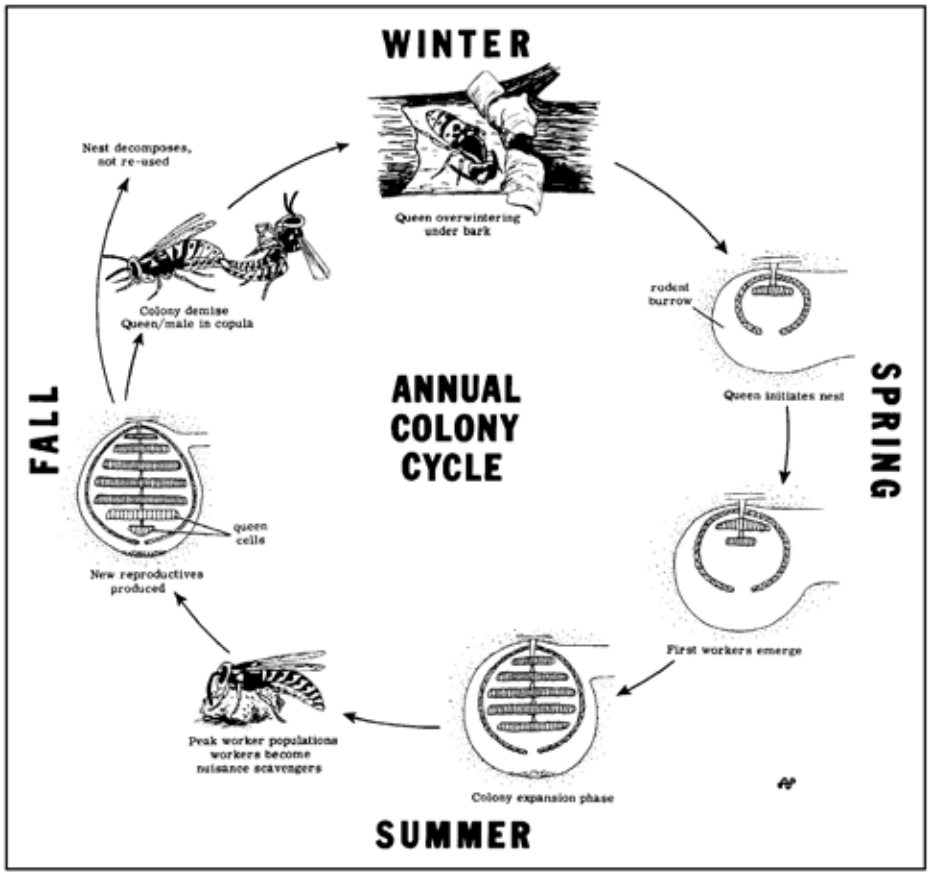
YELLOWJACKETS OVERVIEW

CLASS: Insecta
ORDER: Hymenoptera
FAMILY: Vespidae
SUBFAMILY: Vespinae
METAMORPHOSIS: Complete
GENERA: *Vespula* spp., *Dolichovespula* spp., Vespa spp.

Introduction — Yellowjackets (*Vespula, Dolichovespula, Vespa* [includes hornets]) are social insects that build enclosed paper nests underground, in trees, or in other structures above ground. Of the 20 species of yellowjackets and hornets found in North America, only five are usually considered pests. They are commonly referred to as Eastern, Western, Southern, German, and Common yellowjackets. These types are considered pests because they love to gnaw and they are all scavengers "with an attitude" who come into frequent contact with

humans as they forage for food. Yellowjackets are known to carry some pathogenic organisms, e.g., the bacteria *Escherichia* and *Salmonella*. Remember, though, that all yellowjackets, including those considered to be pests, are actually beneficial insects in the natural environment due to their consumption of large quantities of other insects, many of which are also agricultural pests. Vespa is Latin for wasp and is derived from Vespillo who (in Greek mythology) was the undertaker whose job it was to carry the corpses of poor people for burial. Vespidae (wasps and hornets) have been used in China to increase sexual stimulation and vigor, to cure impotence and to increase sperm counts. **Yellowjackets are considered to be the most dangerous and agressive pests of all of the wasp species and they become more agressive in the fall.**

Yellow jackets live in very large colonies up to 10,000 workers. **All yellowjackets are back in the nest at night and they will not forage on cold or wet days**. Their numbers peak in late summer. Adults include workers which are sterile females and queens; males which come from unfertilized eggs usually appear in late summer. They are beneficial insects basically as they help control harmful insect pests such as caterpillars, flies and aphids and recycle organic materials. Some yellowjackets forage up to ¼ mile. Once the individual finds food and brings it back to the colony, other members may observe and follow the individuals back to the food source by "social facilitation. They are also helpful pollinators of flowers and they remove honeydew from leaves and keeping rotting corpses cleaned up. Good sanitation and proper management of garbage will go a long way in reducing their colony size. Frequently remove garbage and store it in tied garbage bags and/or in trash receptacles with tight-fitting lids. Double bag your trash in the fall.



The Life Cycle of the Yellowjacket - The above is an original drawing by Rvovonsha 1977. Yellowjackets are the smallest of the common vespids and are about 1/2" long. Most yellowjacket nests are begun by overwintering queens. In spring, the queen digs a cavity in the soil or enlarges an existing hole, constructs a nest from chewed cellulose fibers and lays a dozen or so eggs. As new young are produced, the queen feeds them until they mature to workers and can forage for themselves. After this, she specializes in egg production while the workers feed her and care for the larvae and pupae. The colony reaches its peak in late summer, thus increasing the odds for human "interaction." At this point also, new males and queens mate, the males and workers die, and the fertilized queens seek a sheltered place to overwinter. Wherever you have a lot of flies you have

a lot of yellowjackets feeding on them. Adult yellowjackets gather protein and/or meat and nectar and/or any sweet carbohydrates. These protein sources are masticated by the adults and fed to the developing larvae as semi-liquids. Protein sources include garbage, dead animals, flies, maggots, spiders, caterpillars, etc. - liver is a preferred trap bait both high in protein and also high in the stored sugar glycogen. Adults feed on carbohydrates (especially glucose in sweet fruit juices throughout the season. Because of the yellowjackets interest (especially in spring) for both (sugar or sweet) carbohydrates and protein materials - bait your spring yellowjacket traps with a mixture of protein (meat-based, e.g., liver, hamburger or fish) and carbohydrate (sweet) attractants and your fall traps with sweet fruit juices, chocolate, jam and beer or sweet-liquid materials only. You can add food-grade DE 5% to these materials to kill those that feed on the mixture.

Yellowjackets are the most aggressive of all the social wasps. They are worldwide in distribution with about 19 species occurring in the United States. They are insect predators, but in times of real need they will bite flesh from humans and/or animals; usually they will bite the ears. They are more aggressive than bees and because their stingers are barbless they can sting and bite you repeatedly. They defend their large colonies vigorously. Insect stings kill about 50 Americans each year; most of the bites and stings are inflicted by yellowjackets, so you should always wear proper protection, but if you don't have time and one lands on you; slowly and carefully brush it off and/or simply relax and wait until it flies off; it is better than flailing your arms, hitting or swatting at it. **Avoid sharp, jerky motions. Do not smash yellowjackets**. Near the end of summer they are more likely to sting.

The name "yellowjacket" refers to the typical pattern of yellow and black bands of color on the abdomen of a variety of wasps common to North America and elsewhere. Some species are actually black and white, but are known by the same name. Yellowjacket management is important because the vast majority of people regard yellowjackets (and other stinging insects) as a threat to their health and safety, as well as impediments to their enjoyment of the area.

Description - Adult workers are about 3/8" - 5/8" long depending on the species, with queens about 25% longer. Their abdomens usually are banded with yellow and black, but several species have white and black bands, and 2 northern species are marked with red. The individual worker abdominal color patterns may occasionally vary. Short and stout compared to paper wasps.

Typically, only the inseminated (fertilized) queens over-winter and do so in sheltered places. In the spring, each queen chews up cellulose material to build a personal paper carton nest of a few cells which will eventually grow to 30 to 55 cells covered by a paper envelope. This multi-layered carton or paper nest is usually found below ground (usually in a mouse burrow), but occasionally they are aerial. One egg is laid in each cell and the queen feeds the developing larvae dead insects and nectar. After about 30 days, the first 5 to 7 workers emerge and shortly thereafter take over all the work except egg laying. The nest will eventually grow to include several large rounded paper combs which are open ventrally and attached one below the other; all of which are usually covered with a many-layered paper envelope. Nest size can vary from 300 to 120,000 cells, but the nest usually averages 2,000 to 6,000 cells, and will usually contain 1,000 to 4,000 workers at its peak. Later in the season, larger reproductive cells are built in which queens will be reared; males are usually reared in old worker cells. This is the declining phase. The newly emerged queens and males leave the nest and mate. Only the inseminated queens *hibernate* and survive the winter. The founding queen, the original workers and the males all die. Nests are generally no more than 450' from a protein source. Their larvae need flesh in order to grow.

The over-wintered queen(s) will usually select either a subterranean or aerial nesting site. Yellowjackets usually are ground nesting. Yellowjackets are very slow to sting unless the nest entrance is approached, stepped on or kicked and then they become quite aggressive. Each can sting and bite several times, inflicting much pain. Some people become hypersensitive to their stings which can then become life threatening.

GENERAL CONTROL NOTES - Never send an amateur without protective clothing!

In spite of their potential danger, yellow jackets are considered beneficial insects because they feed on pest insects. In spite of this benefit, they still are a scavenger species that can become very "pesty" and they will also attack beneficial insects, e.g., honey bees. Many common species of yellowjackets emit an attack pheromone when they are crushed. **So, if their nest is considered dangerous, then control is warranted.** During the day, locate where the nest entrance is for each colony to be controlled. First try to control them by spraying them with Not Nice to Bugs® or with diluted Safe Solutions Enzyme Cleaner with Peppermint, dish detergent and water and/or try using baited commercial traps or baited sticky fly strips.

Some protein baits include: canned cat food, tuna fish, Spam, liverwurtst, beef, chicken, pork, fish or liver, apple slices, orange peel. Fruit juices, blue Hawaiian Punch, beer, grenadine, lemonade concentrate, or cherry drink are effective as sweet liquid attractants - try them in traps or spray lightly with diluted Safe Solutions, Inc. enzyme cleaner. You can make your own 2% - 8% boric acid or enzyme baits or food-grade DE with the same materials - but only if you can avoid exposing the bait to pets, kids, and/or wildlife. (Food-grade DE can be safely ingested by birds, kids, pets and wildlife, but not insects.) Place the traps and/or sticky fly strips 3' to 8' above the ground wherever you observe the insects and about 5 feet apart and protected from the rain, pets and people Check your traps daily, clean and rebait as needed. Note: Yellowjackets may drown quicker if a drop of liquid dish soap is added to the water in the trap. Baited traps work best in late summer when other food supplies have become depleted. **Colony control of yellowjackets is about $22 million annually in the U.S.**

If you need more immediate control, use a wet vacuum (filled with at least 1 quart of water and a dash of dish soap or Safe Solutions, Inc. enzyme cleaner) or a dry vacuum with a disposable bag filled with a small amount of talcum powder or cornstarch; put the sucking end at the nest opening at night and turn on in the a.m. (before dawn); leave it run all day until dark (unless it rains); when you have captured all the adults, then tape the end with duct tape and turn off the vacuum. If there is no sound, remove the bag and dispose of properly. Another alternative is to fumigate the nest with carbon dioxide. If you must use a non-volatile, synthetic pesticide poison, use it only after proper notification. All control work should be done at night when most of the yellowjackets (or other stinging insects) are in the nest. Only background lighting should be used and a bee veil and proper protection should be worn. If it is a ground nest, then spray an area for 6" around the entrance hole with an appropriately labeled pesticide poison (or copious amounts of diluted enzyme cleaner and a dash of peppermint soap. If the nest is located in a wall void, then either dust the void with Comet® cleanser or a labeled boric acid or, better yet, food-grade DE via the entrance hole or apply a 1/2 second blast of an appropriately labeled aerosol, e.g., pyrethroid, and close the entrance hole. In a day or so the wall void nest area should again be treated with a long-lasting, silica gel or boric acid or food-grade DE per label directions and/or the area or else should be opened up and the nest and debris cleaned out to prevent future dermestid beetle, spider beetle and/or psocid problems. Soak nests, pests and dumpsters with Safe Solutions, Inc. Not Nice to Bugs® or with their Enzyme Cleaner with or without Peppermint (1 oz. per qt. water), and/or with borax (½ oz. per qt. water), preferably at night, using a red or yellow light.

Most people know and fear the yellow-and-black striped yellowjacket wasps that are common, uninvited guests to late summer picnics. Their stings are painful and for those people allergic to insect venom, they are extremely dangerous. Their encounters with flies that carry bacteria, e.g., *Escherichia coli* and *Salmonella spp.,* sometimes cause food poisoning in people. Many people confuse bees, which are fuzzy and only feed on flower nectar, with wasps, which have shiny bodies and are predators. What most people don't realize is that yellowjackets capture enormous numbers of flies, caterpillars and other insects to feed their young. They have been seen bringing in more than 225 flies an hour to a single nest; one study found that over a three day period, just two wasps collected 20 grams of imported cabbageworms. It is usually only in late summer, when their populations are at their peak and wasps are attracted to plants with ripening fruit or aphid honeydew deposits on the leaves, or pop or beer cans, or cooking meats, that most conflicts arise between humans and yellowjackets. Although they are touchy defenders of their nests, most stings are a result of accidentally aggravating a wasp. Even though bee venom is 10 - 20 times more toxic, 100 yellowjacket stings could cause kidney failure requiring dialysis. About 1 in every 250 Americans will experience an allergic reaction to a wasp sting.

In spring, the mated queen wasp crawls out of her overwintering shelter, fills herself on flower nectar and insects and then builds a nest in a hole in the ground, inside a wall cavity, or hanging from a branch or the eaves of a building. Some spring queens search for access holes in to a building and then they (and/or the workers) can

chew through drywall, ceiling tile and even plywood. Once a queen has decided where to establish her nest, the queen then chews up plant fibers and weathered wood with her extraordinarily tough mandibles to make a gray, papery pulp for the first egg cells. The queen rears this first brood herself, foraging for food and feeding the larvae. In about a month these larvae become adult worker-daughters and take over cleaning, building and feeding chores for the next generation. The wasp population grows and the nest expands all season as the workers add new layers of cells. In late summer the queen stops laying eggs and the last of the brood matures. Among the last generation in late summer are both queens and males that develop in special cells. When they emerge, they mate and the fertilized queen crawls away into a hiding place under bark, in an old stump or under litter to spend the winter. The workers and males all die before winter, the nest falls apart and is not reused next year. **Dry, warm springs allow populations to surge.**

<u>You can avoid being stung by wasps by following a few rules</u>:

1. Remove all outdoor food sources attractive to wasps. Feed pets indoors and keep garbage cans tightly covered and wash cans regularly with diluted enzyme cleaner and borax to remove and/or poison spilled food. Bury fallen fruit and table scraps deep in the ground or in compost piles and don't compost meat scraps or bones. **Don't drink out of open pop cans or containers or at least use a straw.**

2. Watch where you sit or step (don't go barefoot!). Bee especially careful to look before reaching into berry bushes or picking fruit. Thirsty wasps are attracted to moisture so be cautious when swimming or sitting on or handling wet beach towels. Yellowjackets are attracted to bright colors, e.g., blue, red and yellow and to deodorants, colognes, perfume, after shave, hair spray, some bug repellants and sweet-smelling products.

3. Never swat or wave at a yellowjacket hovering around you - it is a good way to get stung. Instead, quietly move away or let the wasp leave of its own accord. The only exception to this is if you have accidentally disturbed a nest and hear wild buzzing. In this case protect your face with your hands and slowly back away 6 - 8 feet and then turn and RUN!

4. Wear a heavy sweatshirt and only pick fruit in the early morning or evening while it is cool and most wasps are still in their nests. Always wear shoes and dull colors.

5. Wasp venom is a complex mixture of biogenic amines, e.g., histamine, dopamine, serotonin, peptides (kinins) and enzymes; these are responsible for causing the swelling, pain, irritation and redness. Some people are hypersensitive and may become unconscious or even die after being stung even once. Other reactions include nausea, hives, skin eruptions, swelling, dizziness, wheezing, shock and/or respiiratory distress.

6. Skin-So-Soft® is an effective repellant for some species of yellowjackets; two ingredients, isopropyl palmitate and mineral oil, act as natural repellants too. Try Safe Solutions Insect Repellent.

Yellowjacket (with at least 20 species in North America) colonies begin with a large fertilized queen; she develops smaller daughter workers and later reproductives just as the Paper wasps, but the nest structure is not the same. Some yellowjacket nests hang in trees and shrubs, and some are developed underground. All nests are destroyed if you can soak them thoroughly with Not Nice to Bugs® or with diluted Safe Solutions Enzyme Cleaners with Peppermint or flood them with carbon dioxide.

AERIAL NESTERS, *Dolichovespula spp.*

Several yellow jackets make the aerial football-shaped paper nests, commonly called hornet nests. Two of these yellow jackets are common: the aerial yellowjacket, *Dolichovespula arenaria (Fabricus)*, and the bald faced hornet, *Dolichovespula maculata(Linnaeus)*.

The aerial yellowjacket is found in the west states, Canada, and east (but not in the central and southern states). This species begins its nest in March or April and is finished and no longer active by the end of July. Their nests, usually attached to building overhangs are smaller and more round than those of other species.

The bald faced hornet is larger than the other yellowjackets and is black and white — not black and yellow. It lives along the west coast, across Canada, and in all of the states in the eastern half of the country.

UNDERGROUND NESTERS, *Vespula spp. and Paravespula spp.*

The stinging wasp, often identified as a yellowjacket, is black and yellow. **Caution: This wasp does not loose its stinger once it penetrates you; it can and does sting repeatedly.** Primarily yellow bands cover a dark abdomen. These species are in the genus Vespula. They begin their nests like the aerial nesters with an enveloped small comb made of wood fiber paper. Only these nests are started in soil depressions, rodent burrows, or in any small hole in the ground that will give protection until workers can develop. Once workers begin nest care, they enlarge the entrance hole and expand the nest. Combs are placed in tiers, one below the other. They can be very large; they have firm support from the soil surrounding the external envelope. Several species of Vespula make their nests in building wall voids, attics, hollow trees and other enclosed spaces as well as the ground. Flood the area at night with copious amounts of diluted Safe Solutions, Inc. with Peppermint using a hose-end sprayer or 2½-gal. rechargeable fire extinguisher and a red light, or put the sucking end of the vacuum (with 2 tablespoons of cornstarch or baking soda in the bag) at the hole at night and turn on during daylight hours, **if it is not raining**. I know of people who pour a small amount of fuel oil in the hole and then ignite the fuel oil, but this is very dangerous. I also know of people who pour gasoline into the nest at night and then cover it, but this is also dangerous and causes serious contamination and may not even kill the wasps. Put 1# - 3# of dry ice on the nest and cover it instead. If you pile a mound of melons, sweet molasses horse feed, suet, honey or other attractants near the hole(s), often hungry skunks, raccoons, opossums, etc. will solve your pest problem for you and excavate the entire nest or simply soak the entire area with copious amounts of Safe Solutions, Inc. Enzyme Cleaner with Peppermint or steam the nest or pour several gallons of boiling water into the nest at night. Wear protective clothing as described and be extremely careful not to scald yourself with the boiling water. If you carefully dust the area/nest with food-grade DE, the wasps generally do not get upset; you should also get control within 2 - 3 hours. You can also put carbon dioxide or carbon monoxide into the nest to "fumigate" all of the occupants. We have used 20# carbon dioxide cylinders with a probe to control these and all other underground nesters.

Both Aerial and Ground Nesters — Of the nineteen species in North America, only a few require pest management. These few species have certain characteristics and habits that put them on a collision course with people:

- They can live in what might be called disturbed environments (areas that have been changed to suit human activities in urban settings) such as yards, golf courses, parks, and other recreation areas.
- They have large colonies — some will develop thousands of workers.
- Their habits do not restrict them to a specific kind of prey. Foraging workers capture insects for their larvae and nectar and other sweet carbohydrates for themselves where they can find it. Essentially, they are scavengers and work over garbage cans and dumpsters. They especially enjoy picnics and football games.

One can easily see that these habits put a large number of foraging stinging insects into close association with large populations of humans. **Bee careful!**

SPECIFIC EXAMPLES

AERIAL YELLOWJACKET
***Dolichovespula arenaria* (Fabricus)**

Is distributed throughout most of the United States.

WESTERN YELLOWJACKET
***Vespula pennsylvanica* (Saussure)**

The Western Yellowjacket is the primary pest yellowjacket in the west and is found from Washington to California. It often builds its nests in rodent burrows, clearing the ground around the entrance and producing a colony of around 5,000 workers. This yellowjacket preys on a wide variety of arthropods but also scavenges. It has been known to drive out loggers, fruit pickers and campers, as well as food facility customers.

COMMON YELLOWJACKET
***Vespula vulgaris* (Linnaeus)**

Second in importance in the western states, *V. vulgaris* also ranges across Canada and the northeastern United States. Common in higher elevations, it nests in shady evergreen forests around parks and camps in the western mountains and the eastern Appalachians. This species also is one of the most important stinging insects in Europe. The colony size is among the largest of the social wasps - mature colonies can have 6,000 - 10,000 cells and 8 - 10 combs.

EASTERN YELLOWJACKET
***Vespula maculifrons* (Buysson)**

This common ground nesting yellowjacket is distributed over the eastern half of the United States. Its western border is from eastern Texas north to eastern North Dakota. Eastern yellowjacket workers are slightly smaller than most yellow jackets, but colony size can number around 5,000 or more individuals. The nest of *V. maculifrons* is dark tan, made of partially decomposed wood and is quite brittle. The Eastern yellowjacket sometimes nests in building wall voids. Sometimes it is incorrectly referred to as the common yellowjacket.

Most yellow jackets have very slightly barbed stingers but the sting will not set in the victim's tissue like the barbed stinger of the honey bee. The stinger of *V. maculifrons*, however, often sticks and when the insect is slapped off, the stinger may remain. (When stingers are left in a victim, they cannot always be assumed to be those of a honey bee.)

SOUTHERN YELLOWJACKET
***Vespula squamosa* (Drury)**

Distributed from Texas, north to Iowa, and east to the Atlantic coast, the Southern yellowjacket is particularly common in the southeastern quarter of the United States. In Florida, colonies are known to be active for more than one year; these southern colonies remain active later in the summer and build up large numbers of workers and reproductives. The Southern yellowjacket sometimes nests in building wall voids.

GERMAN YELLOWJACKET
***Vespula germanica* (Fabricus)**

In Europe, German yellowjacket nests are subterranean, but in North America the vast majority of reported nests are in structures. This yellowjacket is distributed throughout the northeastern quarter of the United States. Nests in attics and wall voids are large with 1 to 15 combs and as many as 6,000 workers, and workers can chew through ceilings and walls into adjacent rooms. The nest and nest envelope of this yellowjacket is made of strong light gray paper much like that of the Western yellowjacket. Colonies of this yellowjacket may continue to be active in protected voids into November and December when outside temperatures are not severe.

GIANT HORNET or EUROPEAN HORNET or GERMAN HORNET
***Vespa crabo* (Linnaeus)**

The last Vespid to be discussed is the Giant hornet (sometimes called the European hornet or the German hornet). Technically, this wasp is the only hornet in North America, but it did not originate here; it was introduced from Europe into the New York area in about 1840. It is found in the northeastern quarter of the United States; it ranges as far south as North Carolina and Tennessee with scattered sightings extending west of the Mississippi River. There are 23 *vespa* species primarily in eastern Asia. These are social wasps that fly at night and are attracted to light. They nest primarily in hollow deciduous trees or enclosed areas, e.g, attics and wall voids. They rarely nest underground.

The giant hornet is almost an inch long and its color is brown with yellow abdominal stripes and a pale face. It builds its nest mainly in hollow trees, and in wall voids of barns, sheds and sometimes houses. An open window or door is an invitation to hornet workers, and they frequent buildings under construction. Their large combs and envelope are constructed of partially decomposed wood and, like the Eastern yellowjacket, are very brittle. Workers of the Giant hornet capture a variety of insects including bees and yellow jackets to feed their young

and they also feed on fruit. Workers also have a habit of stripping bark back from some shrubs - especially lilac. As they girdle the branches to obtain cellulose for their nests, they also lick the sap from the torn edge. They will sting humans, and their sting is painful.

BALD- OR WHITE-FACED HORNET
***Dolichovespula maculata* (Linnaeus)**

Another common yellowjacket is the bald- or white-faced "hornet". *Dolichovespula maculata* (Linnaeus) which is moderately large. There is always a danger from anaphylactic shock from the venom of a hornet. The basic color of the body is black with whitish or very pale yellowish markings. It has a noticeable separation between the lower margin of the eye and the base of the mandible. On warm spring days, the single, large Aerial nesting queen develops a small comb, like the paper wasp with a dozen or so cells, but she encloses it in a round gray paper envelope. The daughter workers later take over the nest duties, and by mid summer, when the worker population is growing and food is plentiful, the nest is expanded to full size. A full-sized bald-faced hornet nest consists not of a single umbrella comb like the paper wasp, but four to six wide circular combs - each one hanging below the other and all enclosed with an oval, gray paper envelope consisting of several insulating layers. The peak number of workers is about 400 - 600. Bald-faced hornets capture insects, including yellowjackets, to feed their larvae. Bald-faced hornets not only gather live flies, but are large enough to kill and use other species of yellowjackets for larval food. They also gather fruit juices and meat protein. They attach their nests to low shrubs or high in trees or on buildings or utility poles, typically in exposed locations. They will occasionally nest in lawn ornaments. Although aerial colonies can have four to seven hundred workers at one time, their food gathering habits do not routinely bring them in contact with humans. Most of their large nests are often discovered only after leaves have fallen and the nests are exposed - both to your view and to nature's elements that finally bring about their disintegration. **Remember, the workers in these nests will all be killed after a few good frosts and the newly mated queens will have left by then.**

INTELLIGENT PEST MANAGEMENT® OF YELLOWJACKETS

Yellowjackets are sometimes responsible for injections of anaerobic bacteria (organisms that cause blood poisoning). When yellow jackets frequent wet manure and sewage they pick up the bacteria on their abdomens and stingers. In essence, the stinger becomes a "dirty" hypodermic needle. A contaminated stinger can inject the bacteria beneath the victim's skin. **Blood poisoning should be kept in mind whenever yellowjacket stings are encountered. Be sure to treat hornets at night whenever possible.**

Problems with yellow jackets occur mainly when:

- Humans use a leaf blower or step on, mow/drive over or jar a colony entrance.
- A colony has infested a wall void or attic and has either chewed through the wall into the house or the entrance hole is located in a place that threatens occupants as they enter or leave the building.
- Worker yellow jackets are no longer driven to feed larvae in the late summer months, and they wander, searching for nectar and juices - finding ripe, fallen back yard fruit, beer, soft drinks and sweets at picnics, weddings, recreation areas, sporting events and other human gatherings.
- Sugary spills or fruit and/or garbage cans with open garbage cans or dumpsters and/or flies are routinely available to the yellowjackets.

Inspection - Carefully dust one with flour - release it - and follow back to the nest. Sting victims often can identify the location of yellowjacket nests. Where the nest has not been located, carefully look in shrubbery, hedges and low tree limbs for the bald faced hornet. Soil nests are often located under shrubs, logs, piles of rocks and other protected sites. Entrance holes sometimes have bare earth around them. Entrance holes in structures are usually marked by fast flying workers entering and leaving. Nests high in trees should not be problems. Bee sure to wear a heavy bee suit, gloves and veil, whenever you work with yellowjackets.

Habitat Alteration - **Management of outdoor food is very important.**

- Practice proper sanitation.
- Clean up sugary spills and garbage cans regularly with diluted Safe Solutions Enzyme Cleaner with Peppermint and/or a boron product and fit them with tight lids. Put garbage in double tied plastic bags.
- Empty cans and dumpsters daily prior to periods of heavy human traffic at zoos, amusement parks, fairs and sporting events. Clean with Safe Solutions, Inc. enzyme cleaners and borax.
- Remove attractive refuse, such as bakery sweets, soft drink cans, and candy wrappers, several times a day during periods of wasp and yellowjacket activity.
- Locate food facilities strategically at late summer activities so that yellow jackets are not lured to dense crowds and events. The National Park Service in their IPM programs, found that stings were dramatically reduced when drinks are served in cups with lids (use a straw).
- Clean drink dispensing machines; screen food dispensing stations, and locate all garbage containers and/or trash cans away from food dispensing windows.
- To limit yellowjacket infestations in wall voids and attics, keep holes and entry spaces in siding caulked; screen ventilation openings. **Don't caulk active infestations!**
- Take a 2-litre bottle that has its top cut off and then inverted inside the bottle making a "funnel" and sealed along the top edges with duct tape - put 2" - 3" of Blue Hawaiian punch or Mountain Dew or sweet (not diet) orange pop and a meat product, e.g., a piece of hot dog, in the bottom - when filled with drowned stinging insects that trap can be emptied and used again or simply thrown away "full." Seasonal Baits: Bait with proteins, e.g., cat food, hot dogs, Spam, hamburger, ham, fish or liver in spring and blue Hawaiian Punch, honey water, apple juice, or grenadine/cherry drink later in summer.

CONTROL

Ground Nests — If needed, use at least two experienced people to vacuum ground and aerial nests after dark (Workers are in the nest at that time). More often than not, because of traditional work schedules, treatment will be scheduled for the daytime. Bee careful. Try flooding the area/nest with Not Nice to Bugs® or with diluted Safe Solutions, Inc. Enzyme Cleaners with Peppermint first. Install strong fans to blow across areas to keep yellowjackets away. Bait in sunny locations, especially with fruit juice and fresh beer. Put 3% food-grade DE in your baits.

Begin with the entrance hole in view and a good plan in mind.

- Everyone concerned should wear a protective bee suit, bee-keeping gloves and a veil. Unless these insects can hold on with their tarsal claws, they cannot get the leverage to sting. Good bee suits are made with smooth rip-stop nylon which does not allow wasps and bees to hold on. A bee veil and gloves are part of the uniform. Wrist and ankle cuffs must be taped or tied to keep the insects out of sleeves and pant legs. **If you are sensitive to venom, do not do any control of stinging insects.**
- Move slowly and with caution. Quick movements will be met with aggressive behavior. Move cautiously to prevent stumbling or falling onto the colony.
- Have enough equipment handy so one trip will suffice. Watch for entrance/exit holes; then vacuum, all of the visible occupants as quickly as possible; **carefully read all the labels and labeling first.**
- Cover the nest with a tarp at night and carefully inject carbon dioxide under the tarp and into the nest.
- Flood the entire nest area with copious amounts of diluted Safe Solutions Enzyme Cleaner with Peppermint using a hose-end sprayer or rechargeable fire extinguisher.
- If you only have one nest entrance, cover the entrance hole with an upside down clear glass bowl at night; cover the edges with sand or dirt; if you have a very large hole or several entrance holes, carefully cover the entire area with a clear piece of plate glass at night - the yellowjackets will not be able to leave, but because they can still see the sky they usually will not dig out and will starve to death in a few weeks.
- Nematodes *(Steinernema fletiae* or *Sphecophaga vesparum)* can be mixed with water into the entrance hole at night. The nematodes are vectors of disease-causing bacteria that kill the yellowjackets.
- Putting treats: muskmelon, honey, etc., on the nest at dusk often will attract raccoons, skunks or another predatory vertebrate which will come eat your bait and the yellowjackets.

As a last resort you can plug the entrance hole with boric acid and/or food-grade DE, dusted steel wool or copper gauze. Dust the plug and area immediately around the entrance. Returning yellow jackets cue on entrance holes using surrounding landmarks and seeing the shadowed opening. They will land at the entrance and pull at the plug picking up toxic dust. Any still alive inside will also work at the dusted plug. If stung, try using a little fresh onion or potato juice or a paste of baking soda mixed with water or rubbing alcohol, or your own urine on a rag and/or see **The Bloodfeeders Overview.** **If the sting is to the throat or mouth, dial 911 and ask for immediate medical attention; give the victim an ice cube to suck until help arrives.** Meat tenderizer works by breaking down the venom; thus it reduces pain and swelling as will antihistamines given every few hours per label/medical directions.

Aerial Nests - There usually is no need to treat nests 15 or more feet in the air.

- Cut treated aerial nests down and seal them in doubled plastic bags; larvae will fall out of their cells and die from starvation. Pupae in capped cells may escape the treatment, however, and emerge later.
- Spray heavily at night with diluted Safe Solutions Enzyme Cleaner with Peppermint using a red light.
- Be especially cautious when using ladders to get at aerial nests o r wall void nests. Set the ladder carefully and move slowly. **Wear all the proper safety equipment.**

How to remove a hanging wasp nest without using poisons:

First, it is a good idea to get a helper and do your work at night. To be safe, both of you should wear protective clothing from head to foot. Although a beekeeper's suit with a hat and veil is ideal, you can assemble a similar suit for the occasion from heavy coveralls, a hat with a wide brim and a length of fine screening. Wear boots with your pants cuffs pulled outside the boot tops and seal the cuffs around the boot top with rubber bands or duct tape so that wasps can't get up your legs. Wear gloves and pull your sleeve cuffs over the tops of the gloves and seal them the same way. Drape the screening over the hat (the brim should keep it away from your face) and tie it around the neck, over the collar of the coveralls. Make sure there are no openings around the collar or base of the veil. You should wear another layer of clothing underneath the overalls because wasp stingers are long enough to penetrate through one layer of cloth. http://www.beesuitscheap.com

To remove the nest, approach in the evening or at night when the wasps are all home and less active because it is cool. (When illumination is needed, use a flash light covered with red acetate film so it will not attract wasps.) Have your helper hold open a large, heavy bag or a box with a tight lid under the nest while you cut the attaching stem of the nest as quickly as possible using a long handled pruning hook, or some other sharp tool. When the nest is in the bag or box, close it immediately and seal shut with duct tape. The last step is to kill the wasps inside the nest with a carbon dioxide fire extinguisher or cylinders or by putting the whole package in a deep freeze for 24 hours or by setting out in the sun on a hot day under a black visquine cover, or inject carbon dioxide at night, or by directing a spray of diluted Safe Solutions Enzyme Cleaner with Peppermint into the package or through a small hole for several minutes, or as a last resort, use only a half second blast of a wasp and hornet spray according to the label directions. **Don't neglect this last step because wasps can and will eventually chew their way out of almost anything.**

Wall Voids — Wearing suitable protection, attach the sucking end of a hose from a "rinse-and-vac" with soapy water, or a dry vacuum with talcum powder or cornstarch or baking soda directly next to the opening of the nest at night. Turn the vacuum on just before dawn and let it run until dark, continue this procedure until no more wasps are seen leaving the hole. Never block up the opening as wasps can chew through wood or plaster or follow wiring into the interior of the house. In the fall, when the nest is definitely vacant, caulk or repair the crack to prevent recolonization the next year. Wasp nests in hollow trees can be quickly controlled at night by filling the entire cavity with aerosol foam insulation, which immediately makes them "fossils" and helps the tree survive.

- You can try spraying/injecting with Not Nice to Bugs® or with diluted Safe Solutions Enzyme Cleaner with Peppermint which not only kills on contact but has a "fumigant" action, or you can fill the void with aerosol foam insulation or dust with food-grade DE.
- Approach the entrance hole cautiously; stay out of the normal flight pattern.
- Watch first. Observe whether yellowjackets entering the nest go straight in or to one side or the other. Install several wasp traps with Blue Hawaiian punch or orange pop or Mountain Dew in the area.
- Tape the vacuum hose next to the hole(s) and let it run all day or until all sound/activity

ceases. If it starts to rain, turn off the vacuum immediately. Then restart as soon as the rain stops.

- As a last resort you can power dust inside the entrance with boric acid and/or silica aerogel or food-gade diatomaceous earth and plug it as with underground nests.
- Remember, German yellowjacket nests may remain active into December.
- **Use care not to contaminate any food surfaces.**

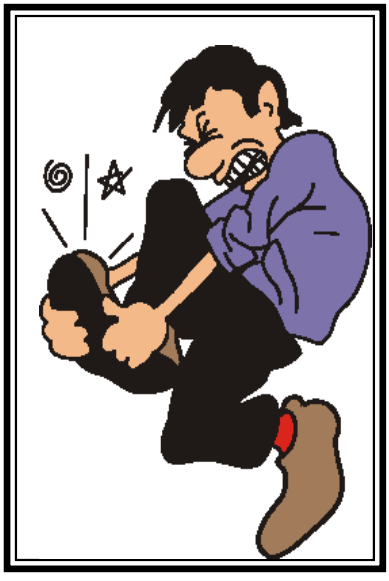
Tree Voids

- Have someone carefully, at night using a light, fill the entire cavity with aerosol foam insulation.

Routine cleaning of sugary spills and trash cans and the outside of food stands with diluted Safe Solutions Enzyme Cleaner with Peppermint will reduce or at least not attract stinging insects, e.g., yellowjackets, at sporting events; use any number of traps. Tie sliced melon, a fresh fish or meat over a **blue** 5-gallon bucket of soap/enzyme water and watch it fill up with workers. Catch and kill queens in early spring with a shallow **blue or yellow** pan filled with sugar water and a small piece of hot dog or bologna, etc., and just a drop of liquid soap or enzyme cleaner or dish soap. A synthetic chemical lure (composed of 2,3-hexadienyl butyrate) is attractive to the Western yellowjacket. Traps with this lure were found to depress wasp populations successfully in a peach orchard and in some western campsites. (Sunny locations seem to work best.) They are ineffective with eastern species. Place a small amount of plum jam in the bottom of a wasp trap and fill about one quarter full of water, or use fresh raw hamburger, or any of the baits mentioned previously. Cut the top off a 2-litre bottle, invert it, and seal the edges with duct tape and put 2" - 3" of Blue Hawaiian punch or sweet (not diet) orange pop, Mountain Dew or a mixture of fruit juices and fresh beer and/or some meat in it - yellowjackets fly in but can't fly out and drown or suffocate quickly - the trap can be emptied and used again or simply thrown away "full" - put these inexpensive but effective traps anywhere you see activity. If you poison any of these bait materials with 2% - 8% boric acid or 4% - 5% enzyme cleaner, be sure to people, pets and wildlife can't reach or drink them. Baits treated with 5% - 6% food-grade DE are not known to hurt any animal or person.

Follow-up - Ongoing monitoring throughout the active yellowjacket season is essential when a pest management program is in place at schools, parks, recreational areas, zoos and other outdoor activity areas.

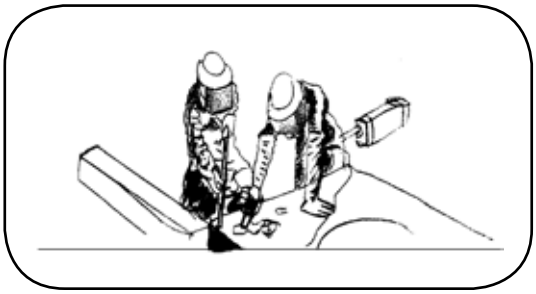
INTELLIGENT PEST MANAGEMENT® WASP & BEE CONTROL STRATEGIES - Use all of the protective clothing. Move slowly to attract as little attention as possible. Whenever possible, nest destruction should be only performed by a team experienced in controlling bees and wasps. Complete body coverage is extremely important because these pests can find even the smallest area left exposed and get inside to "nail you". The best protective clothing is the type made for commercial beekeepers. This includes a lightweight pith helmet or hat, coveralls and long-sleeved gloves. The gloves should be extra long (protecting the wrists) with shirt sleeves secured inside them. Remember, hands are usually the part of the body most often attacked. Long-sleeved (thick) sweatshirts can help cover and protect the wrists. The fabric strength of bee suits makes it difficult for stingers to penetrate, and zippers add protection by sealing pockets and other openings. If you cannot find a bee suit, use a one-piece mechanic's coverall, but first modify it by securely sewing or duct taping all possible stinging insect entrance routes. You should use a second layer of regular clothing beneath the bee suit or coverall because the coverall can cling or stretch, allowing some stingers to penetrate through to your skin. Be prepared to sweat heavily since this type clothing does not provide for proper ventilation. Stuff your pant legs into your socks and then wear high-topped combat-style boots or ankle-high leather work shoes; then tape and/or secure the pant legs around the top of the shoes or boots at the ankle with duct tape, Velcro fasteners or leg straps. Inserting a folded brown paper bag down each pant leg over your knees also helps protect you against stings when you squat or kneel. These paper bags can be held in place with gardening-type knee pads. Commercial bee veils either have a built-in hat or can be placed directly over a wide brimmed hat. A metal-screen face shield that protects and extends around the head for visibility is another desirable feature. Cloth or fabric-type screen, which is sewn directly to the bottom of the metal screen, comprises the remainder of the screening. Its long ties are passed under your armpits, around your back and across your chest for



a snug fit. Make sure you have someone carefully inspect your suit and veil for tears and other openings before you begin any control. Remember, use two people, especially on all nest removal jobs and have each person inspect the other's clothing and veils for openings before beginning any control. Managing any social stinging insects in and around buildings requires previous beekeeping and/or previous pest control experience. Carefully read all labels and control sections before attempting **any** control(s). **NEVER PANIC!**

One way of removing adults from a ground nest (or an aerial paper nest) is by vacuuming them up as they emerge from the nest opening. (Be sure to add a small amount of talcum powder in your disposable vacuum bag.) **Be sure you know where all the main and secondary entrance holes are!** Be sure to wear all of the protective clothing to prevent getting stung and try to (thoroughly) seal all visible openings but one before beginning any vacuuming (it may be difficult to locate and seal all openings). Two people are required to successfully destroy a nest: one opens the nest while the other operates the vacuum. A third protected person is even better; he/she can vacuum up any pests flying about and has a stand-by vacuum if necessary or you can install strong fans to blow them away. You can destroy adults picked up in the vacuum as well as larvae removed from the nest by freezing them or by initially including talcum powder or cornstarch (2 tablespoons) in your bag or using a rinse-and-vac with soap and/or diluted enzyme cleaners in the water to incapacitate the insects; if you still hear "buzzing", add more talcum or medicated body powder and/or freeze them. First try copiously flooding the area with Not Nice to Bugs® or diluted Safe Solutions. Enzyme Cleaner with Peppermint. **Remember, wear suitable protection in every control attempt. Do not try to control stinging insects if you are sensitive to their venom.**

Later, if determined absolutely necessary, use cedar oil, rubbing alcohol or a quick-acting aerogel or liquid insecticide poison to destroy social stinging insects, e.g., hornets and yellowjackets, in their nests, in the ground, wall voids, or other locations. This is done the same way as for control of honey bees. Be sure to seal off all openings except the one used to apply the insecticide poison. Spray the material directly into the nest to prevent any adults from escaping and attacking people and pets. **Wear a respirator under your bee veil.**



Carbon dioxide or carbon monoxide can be used to "fumigate" underground nests. You can produce carbon monoxide with lit charcoal or your car and you can produce carbon dioxide with dry ice, fire extinguishers or cylinders of gas. Both are heavier than air and will kill all underground nesters.

Desiccating dusts, e.g., food-grade DE, talcum powder or Comet®, or a least-toxic pesticide, e.g., boric acid (if labeled) can also be used for control of stinging insects. Seal off all but one nest opening, then blow (or power dust) the dust directly into the nest. This method works well during the day when at least if some of the nest population is away from the area. The workers will brush against the dust upon return and carry the dust back to the queen and developing larvae to kill them all in the nest. Remember, if you must destroy or remove hornet or yellow jacket nests, it is best done at night, when all individuals are in the nest rather than out foraging for food. At night, too, cool temperatures inhibit stinging insects from flying. When using a flashlight, cover the lens with red cellophane or a red filter to make the light less visible to the insects. **Note: Quite often talcum powder or medicated body powder can be used to repel/control stinging insects.**

Paper or umbrella wasps (genus Polistes) are beneficial and are generally not as aggressive. Each nest can consume over 100,000 caterpillars and grubs during the early part of the growing season. They have much smaller colonies than the hornets and yellow jackets, usually only up to 200 individuals per nest. Their nests only have a single layer of exposed cells and are found in protected places such as under eaves or roof tiles. Usually, their nests can be simply knocked down with a pole or stick or water sprayed from a hose or fire extinguisher.

INTELLIGENT PEST MANAGEMENT® STINGING INSECT CONTROL SUMMARY

Stinging insects are included in the very large order Hymenoptera. All species of Hymenoptera undergo complete metamorphosis and thousands of Hymenoptera species are parasites of other insects. When they parasitize pest insects, man lists them as beneficial insects; in many instances they are encouraged, protected or reared and released for their pest suppression qualities. Many species of Hymenoptera are social, including stinging

insects such as yellowjackets, paper wasps and honey bees as well as the ants. Stinging social insects (with a single queen) can be very aggressive because there are many workers that can be used to protect the hive and even expend their life doing it. Stinging, non-social members of Hymenoptera such as mud daubers, cicada killers and carpenter bees tend to be non-aggressive and are usually single, fertile females or queens that do not have a colony or a protective caste with the individuals that can be expended. Use negative ion plates to help prevent most invasions and vacuum any exposed individuals; be sure to first put a small amount of talcum powder in the disposable bag or use a wet vac with peppermint soap or enzyme cleaner in the tank. Try spraying pests and nests with copious amounts of diluted Safe Solutions Enzyme Cleaner with Peppermint.

Final Control Notes: If you must use direct chemical (poison) controls, use them only as spot treatments (outside) and confine your use of poison directly to the nest itself. Anyone applying volatile insecticide poisons should use special clothing that protects the applicator against the chemical as well as against the stings. Poison protection at a minimum should include a respirator, goggles, coveralls and rubber gloves. One "least-toxic" insecticide that was effective for spot application was an aerosol product called Wasp-Stopper. It contained the active ingredients pyrethrin and rotenone, as well as highly evaporative substances that could instantly *freeze* the stinging insects. The aerosol was designed to project its spray 6 feet to 8 feet and could be used around electrical equipment. It was taken off the market because of the evaporative (volatile) "inerts." Peppermint soaps and enzyme cleaners work faster, better and safer. Another insecticide, pyrenone, contains pyrethrin alone, and is available as an aerosol for nest destruction. When purchased as a concentrate, it can be applied with a standard pressurized garden sprayer. We usually use only Pestisafes®, e.g., Not Nice to Bugs®, food-grade DE, talcum powder, Safe Solutions Enzyme Cleaners with Peppermint, but as a last resort, a non-volatile least-toxic pesticide, e.g., boric acid, silica gel, **but whatever pesticide is used be sure to follow label directions exactly.** If you bait, we recommend the IPC trap baited with meat (ham, salmon, tuna fish, etc.) rather than with sweet materials. But, if you can keep wildlife, people and pets away from your baits, make a 2% - 8% boric acid or aspartame bait out of anything you find your target pests eating - if the workers are dying by the baits, you have made the baits too strong. Traps should be frozen for several hours to kill the yellowjackets before opening to rebait. You can also hang fruit or meat, e.g., a fish, directly over a large tub of soapy water (via a teepee of branches); the wasps that drop off will drown. Keep the fruit or fish 4" - 5" above the water. In some communities there are people who collect yellowjackets for sale to pharmaceutical companies that use the dead insects to manufacture anti-venom. They usually freeze and asphyxiate the yellowjackets with a carbon dioxide fire extinguisher. If you try to remove the nest, do so at night with a flashlight covered in red or yellow cellophane wearing appropriate protection. Try spraying individual stinging insects with Not Nice to Bugs® or diluted Safe Solutions Enzyme Cleaner with Peppermint. If you find stinging insects in a tree cavity, carefully fill the cavity with aerosol foam at night using a red light.

Non-pesticide control note: While Africanized Bees quickly die when sprayed with 1 cup of dishwashing detergent in one gallon of water. Diluted Safe Solutions Enzyme Cleaner with Peppermint or natural soaps with a little peppermint oil or M-Pede® insecticidal soap will also quickly kill them. Remember, it is "illegal" in some states, e.g., California, to use any product against bees other than those specific pesticide poisons actually registered for bee control, and nothing is registered for homeowner use. Hopefully you will have enough time to be able to wait for the *professional* poison sprayer to come. **The Author has always beelieved it is better to bee judged by 12 than carried by 6.**

SWARM TRAPS Scentry® Swarm Traps (Scentry™ Monitoring Products, P. O. Box 426, Buckeye, AZ 85326, 602-386-6737) baited with pheromone lures can be used to capture honey bee swarms. Manufactured of reinforced paper pulp that mimics the hollow of a tree, a favorite home of swarms. Two styles are available: the cone and the box style traps in which up to standard-sized frames of foundation may be inserted in the trap to aid in transfer of the swarm later. The pheromone lure is good for 1 swarm season and can be used over and over enabling capture of many swarms on a single lure. Kits come complete with your choice of trap and 1 lure with instructions. Systems are available for both the European honey bee and the Africanized honey bee. Caution: Pheromones require special handling. Extreme caution must be exercised when handling to avoid contamination. Pheromones have an affinity to penetrate many materials that come in direct contact or have prolonged exposure with them. Pheromones will penetrate the material of any trap it is placed in; use only one trap per species; do not use different insect lures in the same trap as contamination will occur causing lure/trap failure.

All Purpose Traps Note: A very effective stinging insect trap can be made using a 2-liter clear soda bottle; fill the 2-liter bottle with warm water and stab 3 -5 openings around the bottle 5" - 8" up from the bottom with

a ball point pen. Hold the pen so only about 3/4" penetrates the bottle. Drain the remaining water and then pour about 1" of Pepsi or blue Hawaiian Punch, Mountain Dew, orange pop, etc. into the bottle; cap the bottle and place wherever you are having stinging insect problems, e.g., dumpsters, picnic tables, etc.. If pests are escaping through the same punctured holes, redo the trap using smaller holes. If they can not or do not enter, enlarge the openings. Always try to leave the "funnels" the ball point pen makes when it pierces the 2-liter bottle. If your solution does not attract the pests, try some of the other baits. Use your ingenuity, observation and/or imagination. The smell of (apple) vinegar also attracts wasps. Put 2" of vinegar in a long-necked bottle with a few drops of soap or enzyme cleaner - they crawl in but not out! Cut the top off a plastic 2-liter bottle and invert it (upside down) inside the top of the bottle to make a "funnel." Secure the "funnel" to the top of the cut off bottle with duct tape and pour 2" - 3" of blue Hawaiian punch, orange pop/soda, sugar water, or fruit juice and beer in the bottom to attract and drown wasps and hornets. Lightly sprinkle large sheets of fly paper with granulated sugar or pieces of cooked hamburger or tiny bits of sausage and hang in dumpsters, trees, play grounds, decks, or wherever you want to trap stinging insects. Yellowjackets are fly predators and they are attracted to buzzing flies caught inside traps. Baits to attract newly hatched yellowjackets include dog food, ham, fish, tuna fish, meat scraps, and later in the summer, sugar syrups, plum jelly, beer, Mellow Yellow, fruit juice and fermenting fruit. Trapping alone will greatly reduce stinging insects.

Safe Solutions, Inc. Fossil Shell Flower (anti-caking agent) Diatomaceous Earth - When dusted into a nest, dumpster or garbage can, does not irritate the stinging insects, but usually kills the entire colony in 4 hours.

Stinging Insects - Typical First Strikes by Housekeeping/Maintenance

1. **Practice proper sanitation and wear a full bee suit or at least some white protective clothing a bee veil and beekeeping gloves. Bee sure to protect your throat!** Practice proper sanitation. Spills and dumpsters should be cleaned up regularly with ammonia, diluted Safe Solutions Enzyme Cleaner and/or borax. Never caulk an active nest/hole. Use a stethescope to determine the exact location of a nest in a wall void. Yellowjackets are repelled by (empty) orange peels. Plastic barrier tape can be used to cordon off active infestation protect children from "investigating" the infested area. Dumpsters and gar bage cans should be cleaned at least weekly during the summer. **Remember, stinging insects are very sensitive to disturbance of their nests! Most stinging insects will leave you alone if you leave them alone!**
   Store all\garbage in sealed plastic bags! Sanitation is your most important control tool. Use Safe Solutions Insect Repellent.
2. **Spray any visible stinging insects and nests with Safe Solutions Enzyme Cleaner (1 oz. per qt. water)**. Spray paper wasps with soapy water to make them "drown." Use a hose-end sprayer filled with dish soap and/or enzyme cleaners to remove wasps, hornets, mud daubers and their nests, but the very best sprayer the Author has ever used is a 2½-gal. rechargeable fire extinguisher using diluted Safe Solutions Enzyme Cleaner with Peppermint, which does not leave any stains. You can also spray the with rubbing alcohol using a quart sprayer; **be very careful of your eyes and keep out of the reach of children and pets!**
3. **Secure the sucking end of a vacuum by their nest opening at night.** If you use a rinse-and-vac fill it with 3" of soapy water; if you use a dry vac, add 1 tsp. talcum powder or 2 T. corn starch. If their nest opening is over 1", make it smaller. **Turn the vacuum on before dawn and let it run until dark. Repeat as needed**. Only after the nest is emptied should you caulk the opening. Duct tape, coppe mesh, spackle, caulk, hydraulic cement and screens are exclusion materials that should be used abun-dantly. **Vacuums can also be used to remove stinging insects from inside the building. When vacuuming up a swarm (large mass of bees), do so by slowly removing the bees from the margins until you remove the entire swarm. Caution: Be sure the person who is doing the vacumming is experienced and fully protected.**
4. **Use glueboards and/or make 2-liter wasp traps** by cutting off the top (where the bottle begins to curve up), invert it into the bottle (like a funnel), duct tape the edges, add 2" - 3" of beer, Mountain Dew, grenadine, pineapple or apple juice, syrup from canned fruit, Blue Hawaiian Punch or sweet orange or grape pop (add some hamburger or fish flavored cat food if needed) and set out or hang from trees and facias wherever you see stinging insect activity. You can also make a good bait with a mixture of fruit juice and beer or some grenadine or pieces of ripened pears or apples or dog food, ham, fish or other meat scraps. Once inside the beer gives off its CO_2 which is heavier than air and pushes the air out. The

CO_2 in the trap quickly suffocates the stinging insects. You can also use carbonated fruit juice or soda to get the same result. Hang some cans of 3/4 full Budweiser beer by their aluminum tabs from tree limbs as traps. The flies in fly traps will attract yellowjackets, who will then get caught in the same trap. **Sticky window fly scoops or fly paper or glueboards in window casings will often catch individual stinging insects as they fly to the light of the window. Yellow glueboards or Tanglefoot will work well, especially if you put a chemical lure, e.g., n-heptyl butyrate on them. Hang fish or liver over a pail of soapy water to kill yellowjackets. Turn off all but one light or darken all windows but one and vacuum them up. Bee careful!**

5. **Dust ground nests** with talcum powder or Comet® or medicated body powder or food-grade DE and/or soak them thoroughly with Not Nice to Bugs or with diluted Safe Solutions Enzyme Cleaner with Peppermint and DE with a hose-end sprayer at night. Food-grade DE carefully injected into the nest does not normally even agitate the stinging insects and most colonies collapse within a few hours. Cover ground nests with plate glass for several weeks. **Bee careful!**
6. **Rinse empty dumpsters with a hose then spray diluted enzyme cleaner or ammonia** to the point of run off and double bag and securely tie all trash. Install strong fans to literally blow yellowjackets away. Spray the clean dumpster with diluted borax (1½ cup per gallon of hot water). A garbage can with a tight-fitting lid or with a domed, fitted top with vertical swinging doors will keep yellowjackets away from the garbage. Use clean, disposable liners. Throw in some citronella or geraniol beads or a few drops of tea tree oil.
7. **At night (with a red light) inject aerosol foam insulation into the entire nest** if it is in a tree cavity or in a log or in an exterior wall void. **Bee careful!**
8. **You can "fumigate"** ground nests with carbon dioxide or carbon monoxide. **Bee careful!**
9. If you have a ground nest in the fall, simply avoid the area until frost kills the nest, or you can carefully cover the area with a heavy black/dark visquine or plastic at night; keep it covered for 2 weeks. Be sure to weigh the edges down. You can inject CO_2 under the tarp to hasten their demise.
10. **Never caulk or seal any nest site entrances until you are sure all activity has ceased.**
11. Make sweet liquid baits, e.g., light Karo syrup or grenadine or molasses, with 4% - 6% food-grade DE and/or aspartame and/or borax and **place them out of reach of children and pets in yellow caps or dishes.**
12. Make a bait of 50% (orange or grape) soda and 50% corn syrup; soak some cotton balls with the bait and watch the gorged wasps or yellowjackets fly up at a 60° angle heading straight for their nests, flying up to a height of 60 - 80 feet (over the tree tops), always heading straight for the nests. They fly over the trees to keep the sun in view. They descend at a 60° angle to reach their nests. Sight down the route and/or use binoculars to follow them and manually kill the colony. You could also add some aspartame or food-grade DE or borax (about 4% - 6%) to the sweet baits or fish-flavored cat food and let the foraging workers kill the entire colony. **Keep baits out of the reach of children, pets and wildlife. Bee careful!**
13. If you have a colony of stinging insects up higher than you can safely reach to vacuum them, use a long piece of metal electrical conduit (EMT). Slide the conduit up right under the main opening, clamp it securely to the wall and attach a rinse-and-vac (with some soapy water) at the other end and vacuum them from dawn to dusk. You may need some duct tape to secure the conduit to the rinse-and-vac.
14. You can carefully dust Safe Solutions, Inc. food-grade diatomaceous earth into the nest; this should not initially alarm the colony, but will destroy it in a few hours.
15. **Aerosol Foam Insulation:** You can use this material to "permanently" seal voids in trees, playground pipes, etc. to stop stinging insects from building nests in these or any other voids. It can also be used at night **- very carefully -** to make "instant fossils".
16. A combination of cold temperatures (to keep the adults from taking flight) and a deluge of water or heavy rain will quickly drown ground-dwelling wasps. Adding soap or enzyme cleaner to the water greatly enhances the kill.
17. Try making some fruit juice and aspartame baits to kill yellowjackets.
18. **If you still have stinging insects, read the rest of the chapter.**

Always Remove the Aftermath - If you insist on killing a colony inside your walls rather than vacuuming up the colony, always remember to remove the aftermath. Anytime you leave dead insects and/or honey in a wall void you will create the possibility of odors or an infestation of scavenging insects later.

Stinging Insect Dangers - More than 2 million Americans are allergic to stinging insects and the most serious allergic reactions cause up to 150 deaths a year in the USA alone. Usually bees will not use their stingers

unless they feel threatnes or are attacked. Venom of stinging insects such as yellowjackets, honeybees, paper wasps, hornets and fire ants can cause severe and deadly reactions. A potentially life-threatening allergic reaction, called anaphylaxis, can be triggered by exposure to one or more allergens, including foods, insect stings, drugs and latex products. Anaphylaxis can affect multiple areas of the body (such as skin, respiratory tract, gastrointestinal tract and the cardiovascular system). Symptoms can include severe headache, nausea and vomiting, sneezing and coughing, hives, swelling of the lips, tongue and throat, itching all over the body and anxiety. The most dangerous symptoms include difficulty breathing, a drop in blood pressure and shock, all of which can be fatal. Bee careful!

Tips for Relieving Insect Bites - There are venom extraction kits now available and commercial sting reliever kits, but nothing works as well as not being stung or bit.

Bees - Pain can be soothed by a thick paste of baking soda and water. Half an onion applied to a bee sting helps stop the pain and swelling.

Chiggers - To ease the pain an itching of chigger bites, rub with a moist aspirin tablet or put on a dab of nail polish.

General - To treat insect bites, rub on apple cider vinegar, deodorant, or some meat tenderizer to relieve itching. A paste made of baking soda also helps. Try spraying diluted Safe Solutions, Inc. enzyme cleaner from a small ”spritzer” bottle on the bite as a sting reliever.

To avoid insect bites, avoid wearing perfume, bright colors and flowery print clothes or bright jewelry. People who are highly sensitive should consider immunothereapy (desensitizing procedures) and consult their medical provider about emergency kits.

Generally, you will not get stung until you approach the nest. Ants, bees and wasps usually only sting to repel nest invaders. If you are stung, swat them away; this will prevent most stinging insects from injecting all of their venom in you. It takes 20 seconds for them to drain their venom. If a honey bee stings you, carefully remove the stinger; swatting may actually inject more venom. When you are away from the nest, elevate the area that was stung and use ice to reduce the swelling. Over-the-counter medications can help, such as, non-drowsy antihistamine, e.g., Benadryl®. If the reaction spreads, or there is swelling and/or breathing problems and/or you feel faint, seek medical advice immediately; these are signs the reaction is moving through the body. Remember to leave them bee.

Credit Card - If you are bitten by a mosquito or stung by a bee, take a credit card and firmly stroke the bite/sting in an x pattern; stroke up and then down 5 times on the first line of the x and then do the second line the same way for a total of 20 strokes on each line. If a hard bump has formed, stroke the contour over the up a few more times. Clean the edge of the credit card as you work to help remove the toxins and stinger from the edge of the card. Relief should be complete with an hour or so.

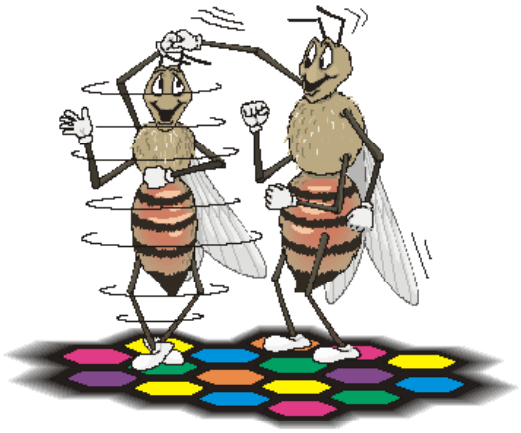
Trap Caution: Keep all traps in areas inaccessible to children because large numbers of yellowjackets may be attracted to the baits. When traps are full of still live yellowjackets; either place them in a freezer for a day or in a black, heavy-duty garbage bag placed in direct sunlight for several hours.

Remember, never use fire or gasoline or volatile pesticides to “control” stinging insects. They are not effective and can incite the creatures to attack! Never use a flashlight or regular light at night = you will direct the angry mob to you! If you use a light at night, use a red light.

Bee-careful!

Colony Collapse Disorder - This disorder has killed off thousands of thousands of honeybee colonies all over the world, threatening the livelihood of commercial beekeepers and farmers and eventually all mankind. The Author believe this terrible destruction of our pollinators is due to a combination of several factors including environmental change, malnutrition, pathogens, mites, pesticide contamination, disease and genetically modified crops.

Approximately one-third of the typical American's diet (primarily the healthy part) is directly or indirectly the result of honey bee production. Safe gardens, fields, yards and pastures where bees can forage without being poisoned by pesticides and frankenfoods are becoming increasingly rare.



Beeswax Candles - Burning a 100% beeswax (a candle only needs 51% beeswax to be labeled as a beeswax candle) creates a uniquely fresh smell that actually helps relieve allergy, sinus and asthma symptoms as burning beeswax produces negative ions that clean the air of dust, bacteria, mold, viruses and other pollutants. Be sure you only burn 100% beeswax candles.

***Safe Solutions products may be purchased online at:**
http://www.safesolutionsinc.com
or by telephone at:
1-888-443-8738.