MP451

Africanized Honey Bees in Arkansas

Training Manual

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Africanized Honey Bees in Arkansas Training Manual

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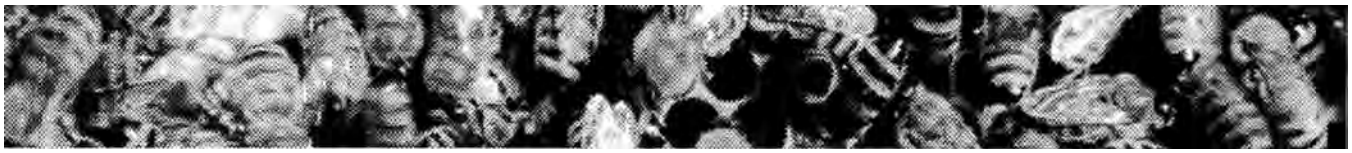

Bees Are Beneficial

Of the many tiny animals that share the planet with us, there are only a few that people generally accept as beneficial, even if they still regard them as disgusting or frightful.

Insects often garner a bad reputation because of their unfamiliar appearance and habits. However, although there are more than one million described species, less than one percent are considered to be pests. The rest are either completely harmless or are beneficial.

It is common knowledge that honey bees pollinate food crops, but some other insects are similarly beneficial. For example, a vast majority of the wildflowers in eastern forests are planted by ants. Insects are also important as food for wildlife and can assist with nutrient recycling and soil development.

One of the insects that is almost domesticated is the silk worm moth, better known for the stage of development when the caterpillar spins a cocoon, producing the stuff that designers from Tokyo to Paris have put to good use. Butterflies are treasured for aesthetic reasons and because they do some pollinating. Ladybugs are cute, and they are one of the insects valued for their eating of other pest insects.

But honey bees are perhaps the creatures with the best public image. We see them as industrious ("busy as a bee"), and we appreciate their main product, honey, as setting the standard for all that is ecstatically wonderful and sweet.

I Love You, Honey

Health food enthusiasts see honey as an alternative to sugar, and many home remedy proponents extol the use of honey as a cure for various ailments. We even call our loved ones "honey" as a term of endearment. The Bible is full of positive references to honey, such as "the land of milk and honey." Prehistoric cave drawings show people harvesting honey from wild bee colonies, and ancient Egyptian carvings depict early beekeeping activities.

Sure, people get stung sometimes. Even Winnie the Pooh found that bees could get a little nasty when disturbed. But, in general, bees and their honey have a long and well-established history of acceptance and respect.

But while the honey is nice, the honey bee's real importance lies in its excellent performance as a pollinator. The value of just the almonds produced in California each year with the help of honey bees is more than twice the value of all the honey produced in the United States in any given year.

Bees Are Important Pollinators

More than 100 agricultural crops in the United States are pollinated by bees. Although there are some bee species other than honey bees used for some of these crops, honey bees are the only ones that can be easily managed, moved around and used to pollinate a wide variety of crops.

About a third of the food Americans eat comes directly from the pollination honey bees and other insects perform. This means bees are important, if not essential, for the production of billions of dollars worth of agricultural products produced annually in the states. In fact, the U.S. Department of Agriculture, through a study at

Cornell University, states that approximately $14.6 billion of our agricultural products is due to the pollination done by our honey bees.

But now honey bees are different and will remain so, thanks to a foreign bee! It came to us from Africa, by way of Brazil, where it was introduced for genetic experiments almost 40 years ago. The bees migrated north and were first found in the United States in Texas in 1990.

Some of the tales told about this bee are incredible. The Africanized honey bee (AHB) is said to attack for no good reason. It is a bee that is difficult to handle for beekeepers who want to move colonies around to pollinate various crops.

This is a bee that has been depicted in science fiction movies like *The Swarm* and *The Savage Bees* as threatening our lives, our property and our whole way of life. Regardless of myths to the contrary, Africanized honey bees do not fly out in angry swarms to randomly attack unlucky victims.

Hype About "Killer" Bees

There has been so much hype and so many jokes about "killer" bees that many people are justifiably confused about them. Are they a real threat or an exaggeration concocted by tabloid journalists and science fiction writers? Is their arrival a cause for alarm or should they be dismissed as a gag on the order of the late John Belushi's "killer bee" skits on *Saturday Night Live* in the 1970s?

The simple answer is that Africanized honey bees are neither a gigantic threat to public health and welfare in general nor are they something to be dismissed as a joke.

We live in a highly urbanized society, and it is reasonable to assume that the average person will never encounter a nest of defensive bees. But it is, nonetheless, quite possible that in the coming years, people who work and play extensively outdoors, at least in the southern part of the United States, will come into contact with these creatures and that many of these people will get stung. If they are far from help and are unprepared, some of them could find themselves in a life-threatening situation.

There is always a threat from any stinging insect, including some species of ants, wasps, hornets, bumble bees and ordinary honey bees. What makes the AHB especially dangerous is its well-established tendency to attack in large numbers when their home is threatened. Most people can tolerate a few bee stings without needing medical attention. A single sting may be dangerous, however, to a person who is allergic to bee stings. If you have any symptoms other than local pain and swelling, seek medical attention immediately. Experience has shown that ten stings per pound of body weight is lethal for non-allergic, healthy adults.

AHB Enters the United States

In May 1991, Jesus Diaz became the first person to be attacked by the invading bees on U.S. soil. He was mowing a lawn at a trailer court in the border city of Brownsville, Texas, when bees, apparently disturbed by the smell of gasoline and the vibration of the motor, began coming after him. When they started stinging his head and shoulders, he leapt from the riding mower and ran, which is exactly what he should have done. Diaz suffered only 18 stings and was treated at a local hospital. Authorities found the guilty colony, destroyed the bees and sent some of the little bee bodies to the USDA Bee Research Laboratory in Beltsville, Maryland, where entomologists, using a number of tests, confirmed them as Africanized.

In the coming year, there were the normal number of other stinging incidents in Texas involving European honey bees, but increasingly, investigators found indications of African genetic influence in their bee autopsies.

In 1992, helped by an unusually wet spring, the Africanized honey bees moved even farther northward into Texas. By late June, Texas officials were getting an average of one report of a stinging incident per day. Many of the cases were serious enough to require hospitalization.

On July 15, 1993, 82-year-old Lino Lopez became the first person to die from an Africanized honey bee attack on U.S. soil. He was stung 40 times after he tried to remove a colony of bees from a wall in an abandoned building on his ranch near Harlingen, Texas. A pathologist who examined the victim's body said the cause of death was the pooling of fluid in the lungs in reaction to the sudden influx of bee venom. Samples of bees from the swarm that attacked Lopez were confirmed as Africanized both by Texas experts and by the USDA in Maryland.

At the same time, Mexican experts were finding Africanized swarms in such desert states as Sonora and Chihuahua, indicating that the bees were no longer just moving up the relatively wet, lowland coastlines but were also moving inland. They were hopping from one irrigated agricultural zone to another and closing in fast on the borders of New Mexico, Arizona and California. Now they have spread into those states plus Nevada, Oklahoma, Florida, Alabama and Arkansas.

AHB Active in Arkansas

With the arrival of Africanized honey bees in Arkansas, we need to be aware of some basic safety information. See the **Bee Safety** section for what you should do. Arkansas authorities, working with beekeepers and bee researchers, have developed a comprehensive Africanized honey bee management plan for our state.

While experts acknowledge that the influx of Africanized honey bees probably will increase the number of insect-related deaths in the United States each year, they see this as a minor concern when compared to yearly deaths from automobile accidents, cancer, AIDS, murder or even accidental household poisoning. In the first 15 years, since 1990, there have been 14 human deaths in this country from AHB.

There are already around 40 people killed in the United States each year by various types of insect stings. Even though each death is important, the increased threat caused by the AHB will hardly cause a hiccup on the statistical picture.

Members of the Arkansas Africanized Honeybee Action Committee have realized that the key to sorting out irrational fears from reasonable concerns is knowledge. To understand the threat of Africanized honey bees, it is necessary to know something in general about honey bees and their behavior. Even the seemingly bizarre attacks of the Africanized honey bees make sense once we understand their survival instincts and how they developed.

Honey bees, whether they are European or Africanized, only sting defensively. They do not go out of their way to sting. In fact, as will be explained soon, individual bees have more to lose in the encounter than we do. Bees of any type are neither bad nor benign. They have their own needs and a highly organized system of providing for the survival of their species.

Understanding the system of the Africanized honey bee and its behavior is the first step in avoiding the nasty consequences of interference with their world.

Bee Basics

There are as many as 25,000 identified species of bees in the world and perhaps as many as 40,000 unidentified species. What we call honey bees are represented by eight to ten species worldwide, and the number is growing steadily. There are approximately 3,500 identified species of bees in the continental United States, only one of which is a honey bee.

Most of the bees found in Arkansas are solitary bees such as sweat bees, carpenter bees, leafcutter bees and mason bees. A few are social creatures like the bumble bee and the honey bee. Bumble bees are the big, yellow-and-black, fuzzy-looking bees you see most often in the garden. They live in groups in nests in the ground, usually beneath shrubs, tall and dense vegetation or debris laying on the ground. Honey bees are about 5/8-inch long and are a deep burnt-orange color with alternating darker bands around their "tail" (abdomen). These bees live as close knit social colonies in a variety of locations both above and below ground.

Not all bees sting, but the lack of a stinger does not make them innocuous. Some tropical stingless bees found in Central America can inflict painful bites.

Honey bee colonies are usually not exposed to the elements. The bees generally prefer enclosed areas, but they will sometimes construct colonies in trees or rock outcroppings. These will often feature several elaborate exposed combs full of amber-colored honey. If a colony of honey bees is managed by someone, it is usually referred to as a hive, while all the others are called feral (wild) colonies. See the **Vocabulary** section for complete definitions.

"Swarming" occurs when part of the colony breaks off with the queen and flies off looking for another place to call home. The bees engorge themselves on their honey reserves before leaving so as to have sufficient energy to make it to a new location. There can be multiple swarms from one hive, since new queens can also emerge and fly off with part of the colony. Once the bees become established, they begin to build a honeycomb.

The six-sided, white wax chambers that make up the honeycomb inside the hive vary in size according to the purpose. Smaller chambers are for raising female worker bees; larger ones are for raising male drones. The queen's chambers are also larger and longer. The comb is made of beeswax, a substance secreted from worker bee abdominal glands. Other construction in and around the hive is done with propolis, a sticky substance bees manufacture from the resin of trees and plants.

Hive Produces Many Riches

Of course, the most important product found in the hive is honey. But there are other riches as well. Worker bees who take on the role of nurses also produce a substance called royal jelly from special glands in their heads. This is given to the larvae that are to develop into queens and is also prized by many health food consumers for its nutritional value. Pollen stored in the honeycomb is used as a source of protein in feeding all the developing larvae known as the brood.

Part of the reason honey bees are so important as pollinators is that they seek out flowers with pollen, unlike pollinators such as bats and hummingbirds that are primarily interested in nectar.

Honey bees also have lots of little hairs on their bodies. Even their eyes have hairs. A furry little bee wiggling around inside the flower picks up a lot of pollen. But the thing that really makes honey bees the world's best pollinators is that there are so many of them.

Each full-sized hive, at the height of the growing season, contains an average of 40,000 individual bees. Some well-managed hives in bee yards contain up to 60,000 bees. These numbers also make honey bees dangerous when aroused, since a disturbance can provoke an eruption of several thousand angry bees from the hive.

Apis, Apiculture and Apiary

The honey bee is known to scientists as *Apis*, from which comes the word for beekeeping, apiculture, and the word for a bee yard, apiary. The species of honey bee commonly found today in Europe, Africa, the Middle East and the Americas is *Apis mellifera*, which means honey carrier. This term is not technically correct as the bees carry nectar from flowers, which they then use to produce honey back in the hive.

There are at least 12 African races of honey bees. The African group of bees includes not only the largest number of geographic races, but also some of the best known, such as the notorious *Apis mellifera scutellata*. This is the subspecies that started the whole phenomenon known as Africanization.

Since they are all of the same species, bees from one subspecies can mate with bees from another subspecies, creating even more variation within the honey bee universe.

An individual honey bee is no bigger than the top joint of your little finger and, being so small, would not get much respect in the animal kingdom were it not for its sting. Honey bees use this weapon to defend themselves and their colonies, but the reactions of various types of bees to perceived threats vary from mild and almost docile to angry and mean.

The bees, now known as Africanized honey bees, are in the latter extreme. They are far more defensive than any other variety. They are generally very quick to respond to any perceived threat and are also ten times more likely to attack in large numbers than bees from Europe and Asia.

African Bees Developed Cranky Attitudes

Entomologists believe that African bees developed their cranky attitude over thousands of years through the process of natural selection, just as the milder character of European bees was shaped by the environment and many years of domestication by humans.

European bees had to develop tactics for dealing with winter, storing sufficient honey for the cold months and also developing a means of keeping warm. They did this by forming a tight ball of bees around their queen to conserve heat. During the warm months, the European bees had wonderful foraging opportunities, abundant water and relatively few predators. The European bees also had a regular, dependable change of seasons every year.

In contrast, the bees from eastern and southern Africa had a year-round warm climate with frequent droughts and often unpredictable weather patterns. They also had to contend with a wide variety of predators that attacked and destroyed colonies that were not fierce. Among the predators were human beings, who depicted themselves in rock drawings applying fire and smoke to hives to rob the bees of their honey.

In Europe there are similar prehistoric art works showing people stealing honey but not destroying the hives. Both honey bees had to develop some defensive capabilities, but the Africans may have had more compelling defense needs than the Europeans.

Tough Little Survivors

So, rather than view the African honey bees as a bunch of aggressive little bullies, they might be seen as tough little survivors who do not tolerate any attempts against their security without providing a quick, effective response.

What this means in practical terms is that Africanized honey bees can patrol an area that may encompass a circumference of up to several hundred feet. Depending on the time of year and other factors, they react defensively to any perceived threat in that area.

In most respects, the Africanized honey bees live and act just as the European honey bees do. They both build a nest that develops into a colony, an organic unit in which the survival of the whole is supreme and individuals are frequently sacrificed to this end. This creation of a complex, unified community comprised of thousands of individual beings is one of the things about honey bees that has fascinated people throughout the ages.

Three kinds of honey bees make up a hive. Each hive has only one queen, a relatively small number of males (drones) and a large number of females (workers). Virtually all the bees you see in the hive are workers.

The vast majority of honey bees in any hive are female worker bees who perform such tasks as foraging, housekeeping and guarding the hive entrance. The male members of the colony, the drones, are somewhat larger and make up only about 5 percent of the hive population.

Drones Are Couch Potatoes

The drones are the couch potatoes of the insect world. They hang around in the hive and suck on honey and, for the most part, just get in the way of the workers. Occasionally, they fly out to test their wings, but their only real purpose is to participate in one race-to-the-death flight in which they attempt to pass their sperm to a queen.

European honey bees generally kick their drones out of the hive as winter approaches and the colony must hunker down and conserve resources. The workers just push the lazy drones out of the hive and let them starve.

There is one female queen bee to every colony, and her main job is to keep little bees coming. For this reason, she takes what is known as a “nuptial flight” sometime within the first week or two after she has emerged from her chamber. This is when the drones get their chance to partake in the mating ritual. The queen generally will mate with five to eight separate drones before calling it a flight and heading back to the hive. Some queens mate with as many as 20 drones over a period of a few days before calling it quits.

Instead of mating in the warm hive or amid the flowers, honey bees perform their coupling during a high speed chase, flying up to 100 feet in the air. Inside the hive, the drones and queen don’t pay much attention to each other. There really is no reason for them to do so, since it is advantageous for queens to mate with drones that are not from her own hive.

The Drone Zone

But once a queen flies out of the hive to an aerial space called the “drone congregating area,” the queen signals her intentions by releasing a chemical signal called a pheromone. This bee sex scent has most perfumes used by human females beat cold in terms of its effect. The drones love this stuff, and once they get a whiff of it, they go after the queen like fighter planes scrambling for action.

Honey bees engage in what might be called “killer sex.” Only a few of the pursuing drones make contact with the queen, and when they do, they go out in a blaze of ecstasy. The drones lose their seed, their genitalia and their lives in the process of mating. The “pop” sound made by their sex organs turning inside out can actually be heard from the ground.

Once the queen has had her fill, and that is meant quite literally since she takes in as many as five million sperm in a flight, she heads back to the hive to begin laying eggs in beeswax

chambers that the workers have created especially for this purpose. A queen can lay her own weight in eggs every day. Since she can maintain the sperm she has collected for her lifetime in a special pouch in her body, she can continue laying eggs almost indefinitely. The old expression "busy as a bee" has real merit when applied to a pregnant queen. The fertilized eggs laid by a queen produce female worker bees and new queens. The queen also lays some unfertilized eggs, which produce the drones. Since they come from unfertilized eggs, the drones carry only the chromosomes of the queen.

On average, queen bees live for about a year and a half, although some have been known to keep going for up to six years. While she is alive and pumping out eggs, the queen is constantly cared for by workers acting as attendants. In cases where a queen dies prematurely and the colony has no new queen to replace her, some worker bees develop the ability to lay eggs, but because they cannot mate, they produce only drones and the colony eventually perishes.

Busy as a Bee

Activity in the hive looks something like the Los Angeles freeway system seen from above, except that there are no lanes. The bees just crawl all around and over each other, each going about its separate task. Communication is accomplished through a dance language in which the scout bees maneuver and waggle. This is mainly used to inform everyone about the existence and location of a great foraging opportunity.

When honey bees go in search of a new nesting site, scout bees go out to find a suitable location and then return to do a dance, which tells the other bees what has been found and where it is. There can be more than one scout returning with such a pitch, and somehow the mass of bees choose one to follow. This is as close as honey bees get to politics.

Honey bees also use chemicals to communicate. The pheromone used by the queen in mating is just one example. Pheromones are also used to help the bees identify each other and to call other bees to aid in the defense of the hive. The queen maintains behavioral control of the colony by a pheromone known as "queen substance." As long as that stuff is being passed around, the message in the colony is that "we have a queen and all is well." When bees sting, they release an alarm pheromone to alert others to the danger.

Bees are sensitive to other smells as well. For this reason, people who wear colognes and perfumes outdoors often find themselves under close scrutiny or even attack by the buzzing creatures.

Beekeepers say that honey bees are also sensitive to mammalian breath. We're not talking about halitosis here, just any breath from humans and animals seems to aggravate them.

Honey bees are attracted to sweets, especially liquid sweets in the form of open cans of soft drinks. This is why they sometimes gather around eating areas at open air events, like fairs and carnivals, and crawl around on the straws and can or bottle tops. While bees are generally not very aggressive while foraging for food or water, they can sting when disturbed, which makes them quite unwelcome at such events.

Another problem can develop when wild bees establish their colonies in roofs, walls and attics, where they leave sweet-smelling residues and other odors that linger even after they abandon their home. These residues can attract other bees, who then make their nest in the same place.

The African Queens

Although honey bees are not native to the Americas, there were other types of bees here before Christopher Columbus wandered across the Atlantic in search of the Indies. Hundreds of varieties of these creatures still inhabit large areas of tropical America.

Stingless bees found in Central America and parts of South America and Mexico were used by native tribes as a source of honey. The ancient Mayan civilization, which flourished in the Yucatan and in parts of Central America, had a fairly well-developed stingless beekeeping industry. The Spanish bishop of Merida during the early colonial period, Diego de Landa, described the festivals of November and December when the Mayans worshipped the god of honey (Ah-Muzencab) in the hopes of obtaining a good flow of nectar for their bees. The descendants of the Mayans still work with these bees to some extent today in the Yucatan.

For more than two centuries after the Spanish and Portuguese arrived in the New World, these native stingless bees remained the primary source of honey in the colonies. However, these small bees produced very little of the sweet, gooey stuff in comparison to Old World honey bees. So, in the early part of the 16th century, the Spanish began bringing over honey bee colonies to establish a bigger production capability. English colonists did the same, and soon honey bees were escaping into the wild and buzzing all over North America.

White Man's Flies

In some cases, honey bees in North America, travelling in advance of the European settlers, came in contact with western Native American tribes, who dubbed them "white man's flies." By the time the frontier had been settled, late in the 19th century, honey bees were regarded as a natural part of the insect world in North America.

By the twentieth century, many people in the tropical zones of South America had also developed a taste for honey, and they imported more European honey bees to establish on their farms. But the South American beekeepers found that the productivity of the European honey bee was not entirely satisfactory, and beekeeping remained a minor industry in all but a few places. The German, Spanish and Italian honey bees most commonly used never adapted well to hot, wet and humid conditions. The tropical American beekeepers began investigating how they might breed a bee better suited to their environment.

Some Brazilians thought the answer might be found in the tropical zone of the continent located just across the Atlantic from Brazil – Africa. They had seen reports of beekeepers in South Africa getting remarkable production from native bees. Some African beekeepers had imported European bees, but they had not done well. The Africans had more success with the indigenous honey bees of the region.

African peoples had been obtaining honey from the wild bees for many centuries, and while they knew how furious the insects could get, they had also developed ways to avoid attack. In Africa's rural and wilderness areas, angry bees are among the lesser dangers humans can face. So the fact that the AHB stings defensively is insignificant in a harsh region where simple survival is often difficult.

Beekeepers in South Africa, Angola, Mozambique, Kenya and Tanzania had been successful in working with the African bees in managed colonies, and they found them to be good honey producers. One South African beekeeper set records for the prodigious amounts of honey production with his African bees, getting an annual average of about 150 pounds of honey from each colony he maintained.

African Queens Imported to Brazil

In 1956 a prominent Brazilian geneticist, Warwick Kerr, was asked by the Brazilian Agriculture Ministry if he could obtain some African bee queens and bring them back for breeding experiments. Kerr had devoted himself to studying Brazil's native stingless bees and was quite familiar with bee breeding and apis culture. In addition, he had just won Brazil's top prize for genetics and was planning to spend the money that had come with it on a research trip to Africa.

Warwick Kerr thought there was a good possibility that he could utilize African stock to produce a new breed of bees that would be less defensive than the wild African bees but would be more productive than European honey bees in Brazil's tropical setting.

After some initial difficulty in packaging bees for transport and keeping them alive, he returned to Brazil with 63 live queens he had obtained from South African beekeepers. These were later taken to a quarantine area at an agricultural research station near Rio Claro, where 48 queens were still alive and well as 1956 came to an end.

By interbreeding the queens through artificial insemination with European drones, Kerr and his associates had produced a number of first generation hybrids. After several months of this activity, natural attrition reduced their stock of African queens to 29, and they were maintained in hive boxes equipped with queen excluders.

Remember that the queens and drones are larger than the worker bees who go out to forage. By putting a device over the hive entrance with holes too small to allow the queen to escape but large enough for the workers to pass through, the normal activity of the hive was maintained while the danger of swarming was eliminated.

Twenty-Six African Queens Escape

In October 1957, however, according to the story that Warwick Kerr has told countless times, a local beekeeper wandered by, noticed the queen excluders and removed them. Such excluders are normally only used in the time before queens begin laying eggs, and it is possible that the fellow was just trying to be helpful.

In any case, as the story goes, the removal of the excluders allowed 26 African queens to escape with small swarms into the lush forest nearby. By the time Kerr learned of the accident, there was no way of figuring out where the bees had gone. He continued his work with the remaining African queens and hybrid queens thinking that perhaps the escaped bees would either perish in the wild or mate with European honey bees and eventually lose their African characteristics.

Within a few years, however, the researchers at Rio Claro began getting reports from surrounding rural areas of feral bees furiously attacking farm animals and even humans. Many poor Brazilian farmers suffered livestock losses, and eventually there were human fatalities as well. By the early 1960s, it was clear that a rapid expansion had occurred among feral bee colonies and that the Africanized honey bees were moving quickly into other parts of the country.

Whereas European honey bee swarms might go only a few miles and then look for an ideal place to establish themselves, the African progeny often moved much farther and built their nests in any hollow log or rocky ridge they could find. They worked fast and hard and produced more little bees, including new drones and queens, who quickly went out and bred with other bees, extending the feisty bloodline all through Brazil's honey bee population.

The African Bee Traits

Other than their super defensive tendency, the Africanized honey bees have a few other characteristics that differ from ordinary European honey bees. They are slightly smaller. Even the cells the Africanized honey bees build in the honeycomb are smaller than those of European honey bees. There are also some slight differences in certain body parts, such as the veins in the wings, which can be measured.

These physical characteristics, however, cannot be distinguished with the naked eye. Even an expert looking at a European honey bee and an Africanized honey bee sitting on the same leaf would have trouble telling which is which. Extensive scientific tests are generally required for a positive identification.

One possible reason for the success of Africanized honey bees in displacing milder-tempered bees is that, in every respect, the Africans appear to be more efficient and more diligent. They get up earlier, work later and visit more flowers per foraging flight than do European bees. When the moon is bright, Africanized honey bees will often continue to forage late into the night.

This workaholic attitude even extends to reproduction. Africanized queen bees lay eggs at a slightly faster rate than do their European counterparts. Colonies of Africanized honey bees also produce a significantly larger number of drones than do those of European bees.

Africanized Honey Bees Are Nervous

The Africanized honey bees are nervous in behavior. They tend to swarm more often, and they are also more likely to abscond.

"Swarming" occurs when part of the colony breaks off with the queen and flies off looking for another place to call home. The bees engorge themselves on their honey reserves before leaving so as to have sufficient energy to make it to a new location. There can be multiple swarms from one hive, since new queens can also emerge and fly off with part of the colony.

When bees "abscond," they all take off to find a new nest. Bees typically abscond when they sense a threat to their colony or when foraging opportunities have almost been exhausted in the present location. Africanized honey bees are more sensitive to threats than are other bees. They have also been selected over centuries to survive in areas where scarcity of resources is common, and absconding is the only alternative if the colony is to survive. The tendency of Africanized honey bees to leave home at a moment's notice makes them more difficult to manage and can limit the amount of honey that can be harvested from their hives.

The honey produced by Africanized honey bees is the same as honey produced by other bees. Eating the honey produced by these aggressively defensive bees will not lead to aggressive or defensive behavior in humans.

Bee Hive Is Self-Sustaining Community

Bees produce honey and other products useful to humans as part of their natural mission to create a self-sustaining community. Honey is produced from nectar collected from flowers combined with enzymes produced by the bees. The flower advertises itself to the bees with colorful petals, some of which contain streaks of ultraviolet color invisible to the human eye. Like airport runway lights, these ultraviolet streaks guide the bees to the nectar.

The visiting bee then moves her head down into the flower to ingest some of the sweet liquid. As stated previously, in the process she picks up pollen, which is carried along to the next flower. The transfer of pollen (which basically consists of male reproductive cells) from the stamen of one flower to the female portion, or pistil, of another flower is the method many plants use to accomplish fertilization.

As for the bee, she takes her bellyful of nectar back to the hive and gives it to a "house bee" who mixes it with enzymes. Then she deposits it into a chamber where it remains exposed to air for a time to allow some of the water to evaporate. The bees help the process along by fanning the open chambers with their wings. The honey is later capped with beeswax and kept for future use.

Honey bees pick up pollen on all their body hairs but move it to special hairs on their hind legs that work like little baskets. Foraging bees returning to the hive often have balls of pollen hanging from these hind leg hairs. They store the pollen in the hive as a protein-rich food for developing larvae. There is evidence that Africanized honey bees spend more time collecting pollen than do European honey bees, because they need extra protein to produce more brood. This is part of the African tendency to favor expansion and frequent division of the colony, as opposed to the European tendency to build up large stable colonies full of honey for the winter.

During those hard times when there are few foraging opportunities, bees sometimes raid other weaker colonies looking for honey to steal. The robber bees cannot saunter into a different hive unnoticed. Guard bees at the hive entrance usually try to fight off invaders in stinging duels. Africanized honey bees have a noticeable tendency to raid other colonies, especially during periods of drought or famine.

It has also been demonstrated that African and Africanized colonies can and will usurp European honey bee colonies. They have been observed to move near the location of European colonies and wait for an opportunity to invade the colony by physically and genetically taking over the colony, therefore Africanizing it.

Inter-Bee Battles

In regard to these inter-bee battles, it should be noted that a honey bee can sting another bee more than once. But if she stings you or your pet, you have the satisfaction of knowing she won't be stinging anyone again. As is the case of the poor drone during mating, the female worker bee sacrifices her life in stinging an animal or a human in defense of her hive. This occurs because the honey bee stinger has a barbed end that gets caught in the skin. The bee literally tears her insides out trying to extract the stinger after having sunk it into the victim's flesh.

Queen bees also have stingers and use them in battles with each other for dominance of the colony. When new queens emerge from their incubation cell and are detected by the current queen, a battle ensues. The victor is usually the first to emerge or the strongest, most vigorous female. In this way, the stability of the colony is maintained. When a queen gets old or weak and slows her production of queen substance, she is generally replaced by a new queen. Queens normally live one to two years.

The bee's stinger evolved thousands of years ago from an ovipositor, a tube on the tail, which was used for laying eggs. This makes sense as all worker honey bees are sterile females. The stinger is nature's way of giving these little animals a way to defend themselves against much larger creatures. The venom generally contains small amounts of toxic material as well as chemicals to produce pain. Nature's strategy here is to inflict some immediate punishment to chase potential attackers away and to do more serious damage to those who do not run away fast enough.

The Africanized honey bees have spread through most of the Americas partly because of their tendency to favor frequent moves in search of new foraging areas. Their biggest move,

however, crossing the Atlantic from Africa to Brazil, was not done through their own initiative. Man helped them on that one.

Beekeepers and European Honey Bees as a Defense Against Africanized Bees

Contrary to common logic, beekeepers who keep European honey bees are the first and best defense against the influx of Africanized honey bees. African honey bees swarm and abscond into areas where foraging is plentiful. An area where nectar and pollen are available and there is a lack of other foragers is an invitation for new foragers to come in.

It can also be demonstrated that beekeepers who are diligent in maintaining European queens who are mated with European drones can be a deterrent against an area becoming Africanized.

Bee Safety

Whether the Africanized honey bee turns out to be a minor problem or a major threat in the United States, there is no question that some individuals are going to experience the pain, and perhaps even the tragedy, of an encounter with the testy little critters.

The Africanized honey bees pose the greatest threat for people who need to work outside: farmers, construction workers, park rangers, lawn and garden service people and even pest control agents. Because they play outdoors often, children are also at risk.

From the information given previously, you now know about the bees themselves and why they attack defensively. But safety depends on more than knowing about the bees. It depends on knowing what to do long before the moment of crisis comes.

Bee Alert

The most important thing to know is how to avoid an encounter. If you live in an area that has already been colonized by Africanized honey bees, then you should stay vigilant.

Conduct a monthly inspection of your house and yard to see if there are any signs of bees taking up residence. If you find a swarm or an established bee colony, leave it alone and keep your family and pets away. **Contact your local Cooperative Extension Office or the Arkansas State Plant Board directly for instructions (501) 225-1598.**

One very effective method of controlling agitated bees is the soapy water procedure, whereby the bees are given a bath to end all baths. Research has found that a mild solution of dishwashing detergent or some other soapy product (approximately 1/2 cup per gallon of water) will immobilize honey bees and kill them within 60 seconds. But you should not attempt to douse a colony of wild bees you happen to find in your backyard unless you have had proper training and are wearing protective clothing.

When you are outdoors, in a rural area, a park or wilderness reserve, be aware of your surroundings and keep an eye out for bees the way you would watch out for snakes and other natural dangers. But don't panic at the sight of a few bees foraging in the flowers. Bees are generally very docile as they go about their work. Unless you do something really outrageous, such as step on them, they will generally not bother you.

A bee can get entangled in hair or clothing, and when this happens, take care to help her escape. If she stings, she will release a pheromone that could attract other bees.

A honey bee swarm that has landed on a rock or tree limb can be quite impressive because of the number of bees involved or because the swarm may look threatening. However, they are unlikely to even notice you if you leave them alone. Only experienced beekeepers should approach a swarm.

Obviously, it is best to avoid contact with any wild nest of bees. They have the advantage of flight. Almost all cases of Africanized honey bee attacks can be traced back to some provocation, such as a kid tossing a stone at the hive, or some noise or vibration, such as that of a lawnmower, weed eater or tractor. The smell of newly cut grass also riles the bees.

In a few rare cases, the people who came under attack hadn't done anything to upset the bees but are hapless victims of circumstances. Once disturbed by something, Africanized honey bees can range quite far from the source of irritation, attacking anything that looks threatening. Quite often bees will display some

preliminary defensive behavior before going into a full-fledged attack. They may fly at your face or buzz around over your head. These warning signs should be heeded, since the bees may be telling you that you have come into their area and are too close to their colony for comfort – both theirs and yours!

Bee Attack!

Once the bees get riled up, the most important thing to do is get away as fast as possible. Do not try to retrieve belongings nearby. Do not try to stand still in an attempt to fool the bees. That may work with a snake under certain circumstances, but bees won't be impressed. Do not try to fight the bees; they have the advantage of numbers and the gift of flight. The more you flail your arms, the madder they will get.

A bee can attain speeds of 12 to 15 miles per hour, but most healthy humans can outrun them or at least outdistance them. So, RUN! And when you run, keep running. Africanized honey bees have been known to follow people for more than a quarter mile.

Any covering for your body, especially for your head and face, will help you escape. While outdoor enthusiasts can hardly be expected to go around in bee suits, a small handkerchief or mosquito net device that fits over the head could easily be carried in a pocket. People who have been attacked say the worst part is having the bees sting your face and eyes. Any impairment of your vision will also make it more difficult to escape. So even though a net over your head may leave the rest of your body exposed, it will allow you to see where you are going as you run away from the colony or source of the bees.

If you do not happen to have a net head covering with you, grab a blanket, a coat, a towel, anything that will give you momentary relief while you look for an avenue of escape. But the covering device is not going to protect you for long. The idea is to use it to help you get away.

If you have nothing else, pull your shirt up over your face. The stings you may get on your chest and abdomen are far less serious than those to the facial area.

Try to find shelter as soon as possible. Take refuge in a house, tent or a car with the windows and doors closed. If there is any opening, the bees will likely find it. Some bees are bound to enter with you, but you should be able to swat them easily enough. Even if you do get stung a few times, remember that each bee can only sting once. As long as the number inside the shelter with you is small, you have the advantage.

Of course, there are going to be circumstances in which escape is not an option. Elderly people, the disabled and small children may not be able to outrun the bees. Everything depends on the exact circumstances, but generally a good idea is to cover such people quickly with a heavy blanket or tarp of a light color, if possible. Do not jump into water. The bees will wait for you to come up for air.

A large white canvas tarp, like the ones painters use, might be a good thing to have along on such excursions, just in case. If the bees are really worked up, they will not leave a person alone, even if he or she is down on the ground and covered up. A covered person, however, will have a better chance than one who is not covered, and the cover might buy them some time until help arrives.

Experience has shown that bees like to attack dark things. Dark clothing, dark hair, anything dark in color could draw the bees. A USDA entomologist says that when he inspected apiaries, he could often tell that the honey bees were Africanized by the number of stings he got in his black leather camera case.

Bee Stings

Many of the safety measures mentioned in this manual would be difficult to apply under the excitement of an emergency situation if you have

not prepared yourself ahead of time. Most people taking part in normal outdoor activities will not have to go to any extraordinary lengths to be prepared, although certainly a knowledge of basic bee stinging emergency procedures is worthwhile.

But remember, far more people die from sports injuries, lightning strikes, animal bites, asthma attacks and penicillin allergy than die from any type of insect sting. And less than half of the fatalities in that category come from honey bee stings. Motor vehicles kill more than 1,000 times more people than do insect stings. Deaths connected to smoking occur 3,000 times more than do deaths related to insect stings.

Insects kill far fewer people each year than radon gas, slips and falls, electrical accidents, household poisonings, drowning and starvation.

So, while reasonable precautions should be taken, remember that even with the arrival of Africanized honey bees in Arkansas, the risk of serious injury or death from bees will remain low in comparison to other dangers that lurk out there in everyday life.

In the unlikely event that you are involved in a stinging incident, here is a summary of bee sting treatment:

- Take the victim away from the site of the attack and seek shelter from bees.
- Remove stingers by scraping them out sideways with your fingernail, a dull blade or credit card. Do not try to remove with fingers. This only squeezes more venom out of the sac which is still attached to the stinger.
- If the victim has received more than 15 stings and/or displays an unusual reaction, such as large-scale swelling, faintness or difficulty in breathing, seek medical attention as soon as possible.
- Immediate treatment – use cold compresses for swelling and administer oral antihistamines and analgesics.
- If the victim shows signs of a systemic reaction from allergy or mass envenomization, a shot of epinephrine would be advisable. This can be obtained with a prescription from a doctor, and its use should be discussed with a doctor in advance of any emergency situation that could arise. The doctor may also recommend a kit containing an adrenaline inhaler, which can be especially effective in relieving respiratory problems caused by swelling of air passages.
- Severe systemic reactions usually occur within 15 minutes of the stinging and are characterized by the following symptoms:
    - *Skin*: Flushing and hives
    - *Respiratory*: Upper airway obstruction, accumulation of fluid in throat and bronchial spasm
    - *Abdominal*: Bowel spasm, diarrhea
    - *General*: Circulatory collapse, shock, hypotension, fainting, loss of consciousness
- Normal treatment for shock may also help – have the victim lie down and loosen belts, ties or other bindings that could restrict breathing and circulation. Cover with a blanket or jacket. Consult a first aid book or a medical professional for additional suggestions on how to handle a bee sting emergency.
- Allergic reactions to bee stings come only after a person has been previously stung at least once, since the body has had no exposure to the venom and cannot, therefore, have developed an allergic response.

Vocabulary

Abdomen. The third and final section of the insect's body containing the digestive and reproductive organs.

Absconding swarm. Bees that leave their current hive to establish elsewhere because of disease, lack of food or other unfavorable conditions.

Antenna (plural**, antennae**). A pair of slender, jointed feelers extending from the head, containing sense organs that are used to taste, touch and smell.

Anther. In seed plants, the part of the stamen that develops and contains pollen.

Apiarist. A beekeeper.

Apiary. A collection of bee colonies. Also the yard or place where honey bees are kept.

Apiculture. The science and art of raising honey bees.

Bee bread. The pollen of flowers gathered by the worker bees, mixed with honey and deposited in the comb.

Bee dance. The worker bees in a normal colony perform various dance-like movements as a basis for communication. In the most common dance, the bees indicate the direction, distance and kind of food available to other bees of the hive.

Beekeeper. A person who takes care of or manages bees to produce honey and to - pollinate crops.

Bee line. The shortest distance between two points, as the bee flies.

Bee veil. A net veil for protecting the head from bee stings.

Beeswax. A substance secreted from eight glands on the underside of the abdomen of worker bees and used in building their combs. Bees may consume from 8 to 20 pounds of honey to secrete one pound of beeswax.

Brood. Young, developing bees are eggs, larvae and pupae and have not yet emerged from their cells.

Cap. The covering that closes cells containing pupae or honey.

Cell. A single, six-sided unit of comb where immature bees are raised or honey is stored. Cells can be cleaned and reused.

Colony. A community of bees with a single queen, thousands of workers and, during part of the year, a number of drones. The bees work and live together as one family in a hive.

Comb. The wax structure the bees use to store honey and to raise the young bees.

Compound eyes. Honey bees have five eyes. The compound eyes are the two large complicated eyes found on either side of the head that provide the adult insects with vision.

Crop. A membranous sac inside the bee's abdomen used to store nectar during foraging.

Drone. A male bee. Drones have larger eyes, an extra antennal segment and cannot sting. Drones don't assist the worker bees; their sole function is to mate with new queen bees.

Feral bees. Wild honey bees living in unmanaged colonies.

Foraging. The act of gathering nectar and pollen from flowers by worker bees.

Head. The first or front section of the insect's body where the eyes, antennae and other sensory apparatus are located.

Hive. A managed bee colony. The modern hive includes a bottom board, cover and one or more boxes, stacked one above the other. Inside each box or hive is a series of movable frames of comb held in a vertical position.

Honey. A sweet viscous material produced by bees from the nectar of flowers. It contains two sugars dissolved in about 17 percent water, small amounts of sucrose, mineral matter, vitamins, protein and enzymes.

Honey bee. A social, honey-producing bee of the class Insecta. In 1758 Linnaeus named the honey bee *apis mellifera* (honey bearer) and three years later changed the name to *apis mellifica* (honey maker). The American Entomological Society has ruled that *apis mellifera* is the correct scientific name for the honey bee.

Honey comb. A mass of hexagonal cells of wax built by honey bees and used to rear their brood and store honey and pollen. The cells are built back-to-back with a common wall.

Hymenoptera. The insect order to which honey bees belong. Ants and wasps are also members of this order.

Larva (plural, **larvae**). A developing bee in the worm or grub stage; unsealed brood. Second stage of bee metamorphosis.

Mandibles. The chewing part of the mouth of an insect. In the honey bee and most insects, the mandibles move horizontally rather than vertically.

Mating flight. The flight taken by a virgin queen during which she mates in the air with one or more drones. She then returns to the hive.

Metamorphosis. Honey bees change considerably as they grow and develop. The developmental process is divided into four stages: egg, larva, pupa and adult. In insects such as the honey bee, the change is called a complete metamorphosis. Other insects have incomplete metamorphosis because the immature forms closely resemble the adults.

Nectar. A sweet liquid secreted by nectaries located chiefly in flowers and on leaves of plants. Nectar is converted into honey and stored.

Nectar guides. Contrasting colored stripes or spots on the petals of flowers that attract bees to the area where nectar is found.

Nurse bees. Young worker bees that feed the larvae and do other work inside the hive. They are generally three to ten days old.

Ocellus (plural**, ocelli)**. One of the three simple eyes of the honey bee having a single lens and limited vision, often seeing only light or dark. Found on the top of the head in a triangle between the compound eyes.

Ovipositor. Tube on an insect's tail for laying eggs.

Pistil. The female portion of a seed plant containing the ovules. After fertilization, the ovules become the seeds.

Pollen. Dust-like grains formed in the anthers of flowering plants within which are produced the male elements or sperm. Pollen is a nutritious, protein-rich food essential to bees for the raising of brood.

Pollen basket. A flattened depression surrounded by curved spines or hairs located on the outer surface of the bees' hind legs adapted for carrying pollen gathered from flowers to the hive.

Pollination. The transfer of pollen from an anther to a stigma of a flower.

Proboscis. Tongue-like mouthparts used to suck liquids.

Propolis. A kind of glue or resin collected by the bees and chiefly used to close up cracks and anchor hive parts.

Pupa (plural, **pupae**). The third stage of a developing bee, during which it is inactive and sealed in its cell.

Queen. A fully developed female bee that lays all the eggs in the colony. The queen is larger than her worker sisters, and her abdomen is about a third longer than that of the worker bee.

Royal jelly. A milky white jelly used to feed the queen larvae throughout development.

Skep. A straw beehive without movable frames.

Smoker. A device which burns special fuels to generate smoke for the purpose of subduing bees during colony manipulation.

Stamen. The pollen producing organ of flowers.

Stinger. The queen and worker bees weapon of defense. The stinger is an ovipositor modified to form a piercing shaft through which a pain-inducing venom is injected into the wound.

Super. The section of the hive box in which bees store surplus honey, so called because it is placed over or above the brood chamber.

Swarm. A group of worker bees, drones and a queen that spontaneously leave the parent hive to establish a new colony. Swarming is the natural method of propagation of the honey bee colony. The old queen leaves with the swarm a few days before virgin queens emerge. Emerging virgin queens fight among each other for the right to carry on the reproductive process for the old colony.

Swarming season. The period of the year when swarms usually occur.

Thorax. The muscular middle section of the bee's body to which the wings and legs are attached.

Usurption. The genetic and physical process of one colony, in the form of a swarm, taking over another.

Worker bee. Unmated female bees that do the bulk of the tasks in the hive. They feed and care for young developing bees, gather nectar and pollen from flowers, build and repair the comb, defend the colony and maintain hive temperature and humidity.

Public Service Announcements

Public Service Announcements
Radio

10 seconds

Bee alert for bees. Africanized honey bees are in Arkansas. If bees are stinging you, RUN. Seek medical help immediately if you are allergic to bee stings. For more information, call the Arkansas State Plant Board at 501-225-1598.

20 seconds

Be alert for bees. Africanized honey bees are in Arkansas. They look just like other honey bees, so stay away from all bee nests. If bees are stinging you, RUN. Take cover in a house or car if you can. Otherwise, keep running until the bees give up their pursuit. Seek medical help immediately if you are allergic to bee stings or have been stung many times. For more information, call the Arkansas State Plant Board at 501-225-1598.

60 seconds

Be alert for bees. Africanized honey bees are in Arkansas and should not be taken lightly.

Anybody who disturbs an Africanized honey bee nest is likely to be stung a lot of times because the bees are very defensive. They respond in large numbers and will chase their victims up to a quarter of a mile. Look for swarms or nests of bees around the home and when participating in outdoor activities.

Africanized honey bees look just like other honey bees, so stay away from all bee nests. Have bee swarms or nests removed from your home or yard by a pest control professional. Africanized honey bees are likely to become defensive if you come within 100 feet of their nest. If bees are stinging you, RUN from the source of the bees. Protect your head and face as much as possible. Take cover in a house or car if you can. Otherwise, keep running until the bees give up their pursuit. Seek medical help immediately if you are allergic to bee stings or have been stung many times.

Public Service Announcements
Newletters and and Newpapers
700 words

Bee Smart – Don't Bug Bees!

Africanized honey bees look just like common garden honey bees. Only a highly trained expert can tell them apart.

But Africanized honey bees are more easily aroused to defend their "homes" than the bees we are used to. And, when provoked, more Africanized bees will come to the defense. However, most bees will sting if you arouse them by threatening their home.

Africanized honey bees arrived in Arkansas in June 2005. As they increasingly dominate the native bee population, the danger of stinging attacks increases. Here are some important tips on how to avoid stings:

- If you see a swarm of bees, don't disturb them. However swarming bees are unlikely to sting because they do not yet have a hive to defend.
- Leave single worker bees alone. They are collecting pollen and nectar from flowers for food and are not likely to sting.
- If you regularly see many bees, be alert to the possibility that there may be a wild honey bee colony nearby. Look for numerous bees flying in and out of an opening such as a crack in a wall or a hole in the ground.
- Don't ignore bee colonies around your home, even if they don't seem to be a problem. Small colonies that have recently set up housekeeping may be docile at first, but can become defensive with age.
- If you find a swarm or an established bee colony, stay away. **Contact your local Cooperative Extension Office or the Arkansas State Plant Board directly for instructions (501) 225-1598. DO NOT TRY TO DESTROY THE HIVE YOURSELF.**
- Bee proof your home. Fill up or cover over holes and cavities in trees, eaves, outside walls and carports. Put fine mesh screens over water meter box key holes. Remove debris such as old tires, piles of lumber and overturned flower pots – these are all potential colony sites.

- Add a few ounces of pine-scented liquid cleaner to the water of your evaporative cooler and a generous tablespoon of vinegar to the pet water dish or bird bath as a bee deterrent.

- When in the wilderness, wear light-colored clothing including socks. Avoid wearing perfumes, hair spray or scented lotions.

- Don't tether or pen animals near bee colony sites. Regularly check your animal's enclosure for bees that might be establishing colonies. Have a beekeeper remove them immediately.

If you are alert and leave bees alone, the chances you will be attacked or stung are remote. But if you accidentally provoke an attack, here are some tips:

- Run away as fast as you can. Seek shelter inside a car or house with the windows closed.

- Africanized honey bees target the head and eyes. Try to cover your head as much as possible, but keep running and do not slow down.

- Don't flail or attempt to swat the bees. Just get away fast.

- Don't seek refuge in a swimming pool. The bees may wait for you to come up for air.

- If you see someone being attacked, don't rush towards them. This puts you in danger of being stung also. Encourage them to run away or seek shelter. Call 911 for emergency help. Most emergency response agencies have received special training in rescuing victims of a bee attack.

- Once you are away from the bees, examine yourself for stingers. When a honey bee stings, it leaves its stinger and venom sac imbedded in the skin, which kills the bee. Do not compress the stinger by trying to pull it out with tweezers or your fingers. This will only squeeze more venom into the wound. Scrape them out sideways using your fingernail, the edge of a credit card or with a dull knife.

- If you are feeling ill or if you have any reason to believe you may be allergic to bee stings, seek medical attention immediately. Humans can take approximately 10 stings per pound of body weight before the venom becomes life threatening.

For more information, call the Arkansas State Plant Board at 501-225-1598.

Bee Safe

Arkansas has some new residents – Africanized honey bees.

Because their defensive behavior can be aggressive, take simple precautions to ensure your family's safety.

Look for bee activity before working or playing outside – especially when using noisy equipment.

When hiking, wear light-colored clothing, long pants and white socks. Avoid hair spray and scented lotions.

If you discover a hive of bees, have it removed by professionals only. Contact the Arkansas State Plant Board at 501-225-1598.

Bee Proof

Because Africanized honey bees are now in Arkansas, it's important to "bee proof" your home.

Caulk holes in your walls, foundation and in the roof. Fill or cover all holes 1/8-inch in diameter or larger in trees, structures and block walls.

Screen attic vents and water meter boxes. Remove debris like tires and lumber. Add a few ounces of pine-scented liquid cleaner to your evaporative cooler water and a generous tablespoon of vinegar to pet water dishes or bird baths.

If you discover a hive, have it removed by professionals only. Contact the Arkansas State Plant Board for further information: 501-225-1598.

Bee Attack

Africanized honey bees can be aggressively defensive when their hive is threatened.

If attacked, get inside a car or a house. When no shelter is available, RUN away fast. Try to cover your head with a blanket or your shirt.

Don't flail your arms – this further angers the bees. And don't jump into water. The bees will wait for you to come up for air.

If stung, don't pull or squeeze the stingers out. Remove stingers by scraping with your fingernail or a credit card or dull knife. Seek medical attention if you get more than 15 stings.

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Agriculture and Natural Resources

FSA7067

Africanized Honey Bees: How to Bee-Proof Your Home

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With the arrival of the Africanized honey bee in Arkansas, it is important to know what you can do to prevent bees from establishing a colony in your house or yard.

How Honey Bees Establish New Colonies

Honey bees are social creatures that live in groups of up to 60,000 individuals. At certain times of the year, part of a colony separates from the rest and flies out looking for a new home. While on the move, the bees are called a "swarm." The swarming bees may rest in a large group out in the open, such as on a tree branch, and then move on to another site. Once they have found a suitable place to settle down, the bees will begin to build a many-celled wax structure called a "comb." An established colony with comb and brood is much more defensive.

Africanized honey bees are also known to move their entire colony to a more suitable site, a process called "absconding."

How to Prevent Honey Bee Colony Establishment

The best way to prevent bees from establishing a colony on your property is to deny them an ideal environment for survival. Honey bees require three things in order to survive: food, water and shelter. Honey bees use nectar and pollen from flowers as food. Honey bees visit swimming pools, hot tubs and pet and livestock watering dishes/tanks to consume water, not only for themselves but also to take back to cool the hive. They nest in a wide variety of locations, such as animal burrows, overturned flower pots, cavities in trees or rocks, irrigation valve boxes, drainage tiles, discarded automobile parts or appliances and in walls of homes. They may enter openings as small as 3/16 inch in diameter (about the size of a pencil eraser) as long as there is a suitable-sized cavity behind the opening for a nest.

Eliminate shelter.

To prevent bees from settling in your house or yard, you will need to be vigilant for potential nesting sites.

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- Fill or cover all holes 1/8 inch in diameter or larger in trees, structures and block walls.
- Caulk cracks in walls, in the foundation and in the roof.
- Check where the chimney meets the house for separation, and make sure chimneys are covered properly.
- Put window screen over drains, attic vents and irrigation valve boxes.
- Remove any trash or debris that might serve as a shelter for bees, such as overturned clay pots, automobile parts, tires, old appliances, cardboard boxes or stacks of crates.
- Fill or cover animal burrows in the ground.
- Make sure window and sun screens are tight-fitting.
- Keep shed doors tightly closed and in good repair, and exercise caution when entering buildings that are not used frequently.

Monitor water sources.

It will be difficult to prevent access to water sources near manmade lakes, but in your yard you may:

- Discourage bees from visiting evaporative coolers by placing a few ounces of pine-scented cleaner in the water.
- Add 2 tablespoons of vinegar per gallon of water to discourage bees from pet water or bird baths.
- Cover or drain pools or tubs when not in use.
- Repair leaky faucets and faulty irrigation systems.

Removing flowers as a source of food is generally not effective nor recommended, and individual bees gathering pollen and nectar from flowers should be left alone. Bees are very important because they pollinate many plants, including crops such as cucumbers, squash and citrus. In fact, about a third of our daily diet is attributed to insect pollinators.

Inspect your home and yard monthly for signs of bee colonies.

A single bee or just a few bees in your yard does not necessarily mean you have a colony in your yard, because bees will fly some distance in search of food and water. Look for numbers of bees passing into and out of or hovering in front of an opening, and listen for the hum of active insects. Look low for colonies in or at the ground line and also high for colonies under eaves or in attics.

If you do find an established bee colony in your neighborhood, don't panic. On the other hand, don't ignore them either. Small colonies that have recently swarmed may be docile at first but tend to become more defensive with age, so you should have colonies around the home removed as soon as possible. Keep everyone away from the colony. **If you do find a swarm or an established bee colony in your neighborhood, keep everyone away from the bees.** Contact your local Cooperative Extension Office or the Arkansas State Plant Board directly (501-225-1598) for instructions.

Do not try to remove colonies yourself! NEVER shoot, throw rocks at, pour gasoline on, burn or otherwise threaten established honey bee colonies.

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DIVISION OF AGRICULTURE
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University of Arkansas System

Agriculture and Natural Resources

FSA7068

Africanized Honey Bees: What You Should Know

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What You Need to Know About Honey Bees

There are some new honey bees in Arkansas that may be more easily aroused to defend their "homes" than bees we are used to. So you need to be aware of what to do about them.

If I find honey bees feeding in my yard, what should I do?

Honey bees live in large groups (up to 60,000 bees). Single worker bees can fly as far as six miles to collect pollen and nectar from flowers to feed themselves and their offspring. Sometimes they visit hummingbird feeders for sugar water. They also collect water from birdbaths, swimming pools or pet watering dishes. Bees gathering food will sting only if they are trapped in clothing, stepped on or otherwise threatened. Single foraging bees should be left alone.

What if I see a large number of bees?

If you regularly see many bees, you should be alert to the possibility there may be a wild honey bee colony nearby. Look for numerous bees flying in and out of an opening such as a crack in a wall, hole in the ground or in the cover of a water valve box.

If you do find a swarm or an established bee colony in your neighborhood, keep everyone away from the bees. Contact your local Cooperative Extension Office or the Arkansas State Plant Board directly (501-225-1598) for instructions.

Do not try to remove colonies yourself! NEVER shoot, throw rocks at, pour gasoline on, burn, treat with pesticides or otherwise threaten established honey bee colonies.

Do not ignore bee colonies around your home, even if they don't seem to be a problem. Small colonies that have recently set up housekeeping may be docile at first but can become more defensive with age. **You should have wild honey bee swarms or colonies removed immediately by a trained professional.**

What should you do if you accidentally disturb a colony and are attacked?

RUN away as fast as you can. Get to the shelter of a house or car as quickly as possible. Because the bees target the head and eyes, try to cover your head as much as you can, without slowing your progress. Do not flail or attempt to swat the bees, just get away fast. Entering water is not recommended. The bees may wait for you to come up for air.

If you see someone being attacked by bees, encourage them to run away or seek shelter. Do not attempt to rescue them yourself unless you have a bee suit and proper training. **Call 911 for emergency help.**

Once you are away from the bees, examine yourself for stingers. When a honey bee stings, it leaves its stinger and venom sac behind in the skin, which kills the bee.

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Do not compress the stinger by trying to pull it out with tweezers or your fingers, as this will only squeeze more venom into the wound. Scrape the stingers out using your fingernail, the edge of a credit card or with a dull knife. If you are feeling ill, if you have any reason to believe you may be allergic to bee stings or if you have been stung more than 15 times, seek medical attention immediately.

Should all bees be killed?

NO. Beekeepers are being encouraged to maintain their managed colonies because honey bees pollinate many vegetables, fruits and nuts, as well as produce honey. In fact, about one-third of our daily diet comes from crops pollinated by honey bees.

Some Other Bees and Wasps

carpenter bee

bumble bee

Bees are robust, hairy insects. Besides honey bees, some common bees in Arkansas are carpenter bees and bumble bees. Female carpenter bees are entirely black bees approximately one inch long. The males are similar in size but are blonde-colored and are seen less often. Carpenter bees visit flowers to collect pollen and nectar in the same manner as honey bees but do not live in large colonies. They are not at all aggressive, but the females can sting if provoked.

Bumble bees are also large bees but are more brightly colored, with alternating bands of yellow and black. Bumble bees often nest in the ground. They live in groups but do not have as many workers as a honey bee colony.

mud dauber wasp

paper wasp

Wasps are more slender than bees, with a relatively thin waist. Their brightly colored “skin” is smooth and somewhat shiny, often with sharply contrasting yellow-and-black patterns. Their hind legs are narrow and cylindrical. All wasps have four wings, and the females can sting many times. Wasps are predators and feed on many different insects and spiders as well as sweets.

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DIVISION OF AGRICULTURE
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Agriculture and Natural Resources

FSA7069

Africanized Honey Bees and Your Pets and Livestock

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Africanized honey bees (the so-called "killer bees") arrived in Arkansas in 2005. Some colonies of Africanized honey bees defend their nests with more vigor and in greater numbers than the common European honey bee. When bees defend their colonies, they target furry and dark-colored objects that resemble their natural enemies: bears and skunks. Therefore, your pets are likely to be stung when bees are disturbed. Animals that are penned or tied up near honey bees are in special peril.

Do's and Don'ts

- **Do look regularly for bee colonies around your property.** Honey bees nest in a wide variety of locations. They may nest in such diverse sites as animal burrows in the ground, water meter boxes or in overturned flower pots. Sometimes honey bees may nest in the open in trees or shrubs. Look for active bees, and listen for a buzzing or humming sound in the ground, in trees and shrubs or in block walls. If you find a colony of bees, consult your local Cooperative Extension Office or the Arkansas State Plant Board (501-225-1598) directly for instructions.
- **Do not pen, tie or tether animals near known bee hives or nests.** Keep animals away from apiaries and bee nests. Bees may seem docile at first, but don't take chances.

- **Do not disturb or tease bees EVER, and do not try to remove bees yourself.** Do not shoot at, throw rocks at or pour gasoline on bee nests. This will only arouse the bees. Also, do not attempt to control them with aerosol pesticides.
- **Do keep pets and children indoors when using weed eaters, hedge clippers, tractors, power mowers, chain saws, etc.** Honey bees are sensitive to odors, such as the smell of cut grass, and to loud vibrations. Attacks frequently occur when a person is mowing the lawn or pruning shrubs and trees and inadvertently strikes a bee nest.
- **Do keep dogs under control when hiking.** A dog bounding through the brush is more likely to disturb bees than one following quietly at your heels.

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- **Do stay alert when horseback riding through brush or under low hanging branches where bees might nest.**

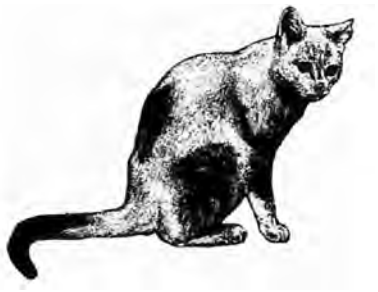
What to Do if Your Animal Is Involved in a Serious Stinging Accident

Try to get the animal away from the bees WITHOUT ENDANGERING YOURSELF. Call your dog inside your house or car, or release the animal **IF IT WILL NOT HARM THE ANIMAL OR OTHERS NEARBY**. Do not attempt to approach a person or an animal being stung without some sort of protection (such as a beekeeper's suit) because the bees are likely to attack you as well. If you approach an animal that is being stung, remember that an injured animal may bite or attack unexpectedly. If you release penned livestock, be aware that an unrestrained animal may run into the road and be hit by a car or may run away. And if the animal runs to you with aroused bees following it, you are likely to be stung too.

If possible, douse the animal with a shower of soapy water which will kill any bees clinging to it. A mild solution of liquid dish detergent in water (approximately 1/2 cup soap per gallon of water) will immobilize honey bees and kill them within 60 seconds.

Covering the animal with a heavy blanket during a serious stinging incident may also discourage the bees.

Once the animal is away from bees, look for stingers. When a honey bee stings, it loses its venom sac and stinger. The honey bee dies after it stings, but the stinger may continue to inject venom for up to a minute or until the stinger is removed. If you can see stingers on the animal, remove them by scraping them out with a credit card, knife or fingernail. Do not pull them out with tweezers or fingers because you will squeeze more venom into the animal.



If an animal has sustained numerous stings, you may want to consult your veterinarian. The number of stings an animal can survive depends on its body weight, the amount of venom it received and whether or not it is allergic to bee venom. As with humans, even one sting may be dangerous if the animal is allergic.

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Preparing Schools for Africanized Honey Bees

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Africanized honey bees have arrived in Arkansas. Schools may want to take a few precautions to help protect students. The following are some guidelines for planning for Africanized honey bee safety on and around campus.

1. **Designate a school monitor** to walk around school grounds daily to look for Africanized honey bee colonies or swarms. Make sure the monitor is trained to recognize honey bees and is properly equipped (has a bee veil available).

The monitor should look for sites that may be attractive to bees for nesting and report to maintenance to remove, cover or repair them. The monitor should remember that honey bees may nest in a variety of sites, ranging from animal burrows in the ground, to hollows in block walls, to overturned flower pots. Utility boxes, water or irrigation valve boxes, playground equipment and drainage pipes are also possibilities. Private property around the school may need to be examined as well, particularly lots or vacant buildings that may be high traffic areas for students arriving at or leaving school.

Keep holes in the ground filled. Cover water valve boxes, rain spouts, etc., with #7 mesh or finer screen. Fill or caulk holes that may give bees access to an internal cavity. Bees may enter a hole as small as a pencil eraser (3/16 inch in diameter).

2. **If a honey bee swarm or colony is found,** the monitor should notify all teachers to keep everyone away from the area. Arrange to have swarms or colonies removed and/or destroyed immediately, even if they haven't been a problem in the past. School administrators should contact the local Cooperative Extension Office or the Arkansas State Plant Board (501-225-1598) directly for instructions. Some monitors may be able to remove swarms if properly trained.

Only licensed professional pest control operators or beekeepers who have received Africanized honey bee training from the Arkansas State Plant Board should try to remove an established colony. Do not allow untrained individuals to spray the colony with pesticides or dump kerosene on the bees. This will only arouse the bees and make them defensive.

Request that the bees be removed after school hours.

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3. **Plan to use noisy equipment, such as lawn mowers, when students are indoors or away from campus**, if possible.

Bees are alarmed by vibrations or loud noises produced by equipment such as weed eaters, chainsaws or electric generators. Honey bees may also be disturbed by strong odors, such as the odor of newly mown grass. Thus, bees are often aroused during landscape maintenance operations.

4. **Establish a plan of action for a stinging incident.**

Teach students to leave bees alone. If a bee nest is found, do not throw rocks at or otherwise disturb it. If students accidentally arouse an Africanized honey bee colony while at school, they should know what to do.

Encourage the students to run indoors if stung. A few bees will follow them indoors. However, if they run to a well-lit area, the bees will tend to become confused and fly to windows.

Call 911 or local emergency service personnel. They have been trained to respond to Africanized honey bee emergencies.

- Designate an area away from classrooms (preferably a large, well-lit room with high ceilings, such as the cafeteria or gym) where students should go. Have a trained person available there or nearby with a vacuum cleaner hose on hand to immediately remove any bees that remain. If no vacuum is available, bees may be killed with a soap and water solution (3 to 6 percent soap) in a spray bottle. The nurse should also be nearby to take care of stinging victims.

- Teachers should be trained in the proper method of removing stingers. Honey bees leave stingers in the skin. This kills the honey bee so it can't sting again, but it also means that venom continues to be pumped into the wound for a short time. Do not pull stingers out with tweezers or fingers, because it will squeeze more venom into the wound. Instead, scrape them out using a fingernail, the edge of a credit card, a dull knife blade or other straight-edged object.

5. **Make sure the school nurse is ready.**

The school nurse should know the proper way to remove bee stingers and should train others. Because even one bee sting may be fatal if the victim is allergic, the nurse should also know the signs of allergic reactions. If possible have an anaphylaxic kit, bee suit and bee veil available for emergencies.

6. **Educate the students and faculty about what is being done.** Reassure them that most people will never encounter Africanized honey bees and that those who do are rarely seriously injured. Have "bee drills" so students know where to go and what to do.

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