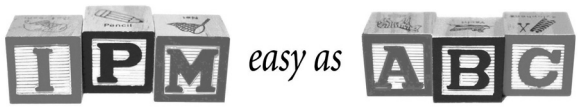
Chapter 6

IPM for Ants



Introduction

Most ants are nuisance pests when they invade buildings searching for food; others, like carpenter ants, can nest in structural wood and damage the structural integrity of wood-framed buildings.

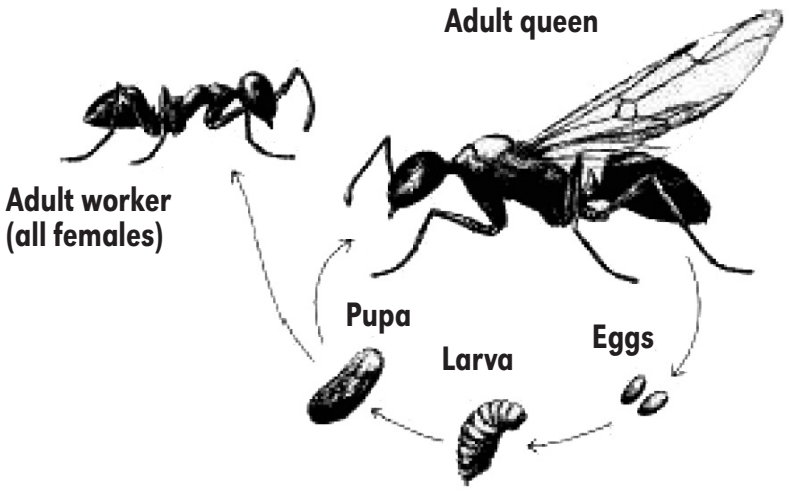
It is important to recognize that an ant species can be both pestiferous and beneficial. Ants kill numerous other pest insects, including fly larvae and termites, and they aerate the soil outdoors and recycle dead animal and vegetable material. From that point of view, ants provide an important ecological cleansing and fertilization service. Since most ant species are not destructive, the first management strategy should be to keep them out of structures. Identification can help distinguish nuisance species from those that are damaging and determine if additional treatment measures are needed.

Identification and Biology

Ants are social insects and live in colonies. The colony is divided into three main castes: workers, queens, and males. The workers enlarge and repair the nest, forage for food, care for the young and queen, and defend the colony. The queens lay eggs, and the males serve only to mate with the queens.

Ants pass through four stages of development: egg, larva, pupa, and adult (see Figure 6-1). Queens mate with males and lay eggs that hatch into blind, legless larvae. The larvae are fed and cared for by worker ants. At the end of the larval stage they turn into pupae that do not feed. Eventually, the adult ants that we recognize emerge from the pupal cases.

Figure 6-1. Ant Life Cycle



It is important to identify your problem ant before you design your management program because ants differ in their habits and food preferences. Use Box 6-A and Table 6-1 to assist you.

Damage

Certain species of ants, such as odorous house, thief, and Pharaoh ants, are particularly prone to getting into food. Inside buildings, these ants are mainly a problem of nuisance since they almost never sting or bite.

Since ants walk over many different kinds of material and sometimes feed on dead animals and insects, it is possible they can carry disease-causing organisms to human food. At the very least, you should assume that food they have swarmed over has been exposed to organisms that can cause spoilage, and the food should be thrown away.

Detection and Monitoring

Visual inspection is the most useful monitoring technique for ants, and can be very useful in preventing an

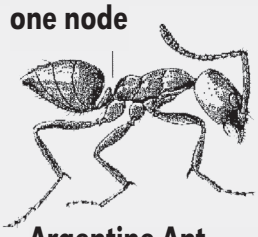
incipient ant infestation. Often it takes detective work and ingenuity to discover where the ants are coming from.

- Begin by constructing a map of the facility on which you can note problem areas and areas needing repair.
- Kneepads, a mirror, and a good flashlight will be helpful.
- Carry a caulking gun and seal all small holes found during the inspection.
- Keep accurate records during the monitoring program to help formulate an IPM plan and evaluate its effectiveness.
- Ants are most likely to be pests indoors, especially in kitchens and food preparation areas.
- An ant infestation may indicate that there has been a change in the methods of storing food or food waste that allows increased access for ants. Note how food and food wastes are stored in the area, and whether refuse containers are emptied and cleaned regularly. Check recycling bins to see if recyclables have been cleaned before storage.
- Speak to the kitchen staff and custodians to learn more about the problem from their perspective.
- Ants can be attracted to snacks kept in classrooms or the teachers lounge, or to something like a sweet drink accidentally spilled on the floor.

Box 6-A. Identifying Ants

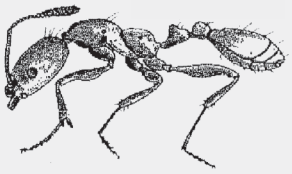
Since ant species can differ widely in their food requirements, it is important to identify the species before choosing a bait. Like all insects, ant bodies are divided into head, thorax, and abdomen. Unlike many other insects, however, ants have a constriction between the thorax and abdomen that gives them their pinched-waste appearance. The constricted part of the abdomen is called the pedicel, and the fat, main part of the abdomen is called the gaster. An important identification characteristics is the number of segments or "nodes" in the pedicel (see the figure below). For example, one-node ants include the Argentine ant and odorous house ant. Two-node ants include the Pharaoh ant, pavement ant, and little black ant. Final identification is made from size, color, other body characteristics, habits, or other information. Table 6-1 provides more information to help you identify your problem ant.

one node



Argentine Ant,
Linepithema humile

two nodes



Pharaoh Ant,
Monomorium pharaonis

Management Options

Habitat Modification

The environment should be modified to reduce ant entryways and access to food. With good quality materials and a careful job, the alteration will be permanent and make a long-term impact on the number of ant invasions.

Caulking

- Caulk actual and potential entryways with a silicone caulking compound.
- Use mildew-resistant caulk in moist areas.
- It is not necessary or practical to seal all cracks, but begin with the access point that the current trail of ants is using.
- Always carry caulk when making inspections and seal as many cracks as time allows, especially those around baseboards, cupboards, pipes, sinks, toilets, and electrical outlets. Silicone caulks are flexible, easy to apply, and long-lasting.
- Weather-strip around doors and windows where ants may enter.

Sanitation

Sanitation eliminates food for ants. Thorough daily cleaning of kitchens and food preparation areas is essential.

- Sweep and mop floors.
- Drain all sinks and remove any food debris.
- Vacuum and/or mop floors daily if people regularly eat there.
- Periodically, give all food preparation areas an all inclusive cleaning,

focusing on areas where grease and food debris accumulate. These include drains, vents, deep fat fryers, ovens, stoves, and hard-to-reach areas behind or between appliances. Thoroughly vacuum the area with a powerful vacuum.

- At the end of each day, remove from the building all garbage containing food.
- Use soapy water to wash any bottles, cans, wrappings, and other items that have food residues clinging to them before storing them for recycling.
- Rinse dishes to remove all food debris if they cannot be washed right away.
- Place garbage in sealed plastic bags before it is placed into a rodent-proof dumpster (see Chapter 13) or other storage receptacle.
- Keep garbage cans and dumpsters as clean as possible to deny food to ants, roaches, flies, mice, and rats.

Since ant species can differ widely in their food requirements, it is important to identify the species before choosing a bait. See Table 6-1 and Box 6-A for helping to identify your problem.

Proper Food Storage

- Food not kept in the refrigerator should be kept in tightly closing containers. Cardboard boxes and paper are not ant- or roach-proof.
- During ant invasions, keep particularly attractive substances, such as sugar and honey, in a refrigerator.
- Although refrigerator storage is usually safe, ants sometimes get into refrigerators and freezers even when the seals appear intact. When this occurs, a light, temporary coating of petroleum jelly on the edge of the refrigerator seal will exclude the ants. Once ants have left, the petroleum jelly can be wiped off. Freezer storage is safe because any ants that manage to get past the seal will die.
- Screw-top jars are ant-proof only if the lid has a rubber seal since the ants can follow the spiral ridges to get into the jar.
- Glass containers with rubber gaskets or plastic containers with tight-fitting, snap-top lids are also ant-proof.
- As soon as they arrive in the building, transfer food packaged in paper to plastic or glass containers. Advise staff not to leave unsealed food items in their desks. Any food kept in offices,classrooms, or staff lounges should be stored in ant- and roach-proof containers.

Physical Controls

Before ants become highly visible in long columns marching through a room, there have been a few "scouts" wandering around looking for food or water. It is always a good idea to kill these scouts before they have a chance to go back to the colony and summon their nest mates. Instruct staff to squash lone, wandering ants whenever they see them.

Vacuuming

- Use a strong vacuum to vacuum up trails of ants effortlessly and quickly.
- Although the dust in the vacuum bag will usually clog the ants' breathing apparatus and suffocate them, you can vacuum up a tablespoon of cornstarch to be sure they die.

Detergent Barrier

Temporary "moats" of detergent and water may be useful during heavy ant invasions.

- Containers of food or food waste that must remain open during working hours can be placed in larger, shallow pans filled with water mixed with a small amount of detergent. Water alone is insufficient since ants can float across using the water's surface tension; the detergent breaks the surface tension, and the ants sink and drown.
- Use this technique to protect potted plants from ants that may be attracted to nectar produced by the plant or to honeydew produced by plant-feeding insects. Elevate the pot above the detergent-and-water mixture by placing it on an overturned saucer. Make sure the plant is not touching anything that ants could use as a bridge.

Flooding

Ants sometimes build nests in potted plants. Rather than disposing of the soil and the plants, water the soil until the ants are driven out.

- It is easiest to do this outside where the ants will find their way to another suitable nesting place, but if this is impractical, use a container of loose dry soil or compost to catch the ants.
- Place the infested pot in a wide and deep container and use a stick to make a bridge from the pot to the ground or to the bucket of soil or compost.
- Water the plant heavily. As the soil becomes saturated, the ants will pick up their white pupae and look for drier ground.

Table 6.1. Common One-Node and Two Node Structure-Invading Ants

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Identification of Structure-Invading Ants in Nebraska

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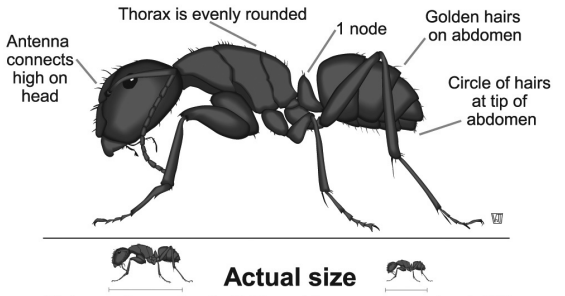
One-Node Ants

Black Carpenter Ant

Camponotus pennsylvanicus

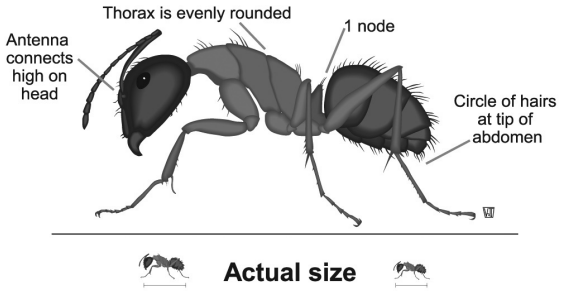
Many sizes of workers.



"Red" Carpenter Ant

Camponotus sayi

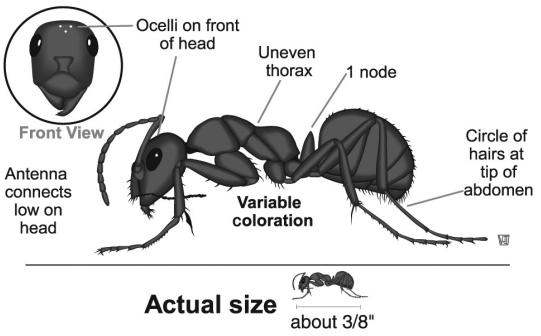
Many sizes of workers. Two-toned red and black.



Field Ant

Formica spp.

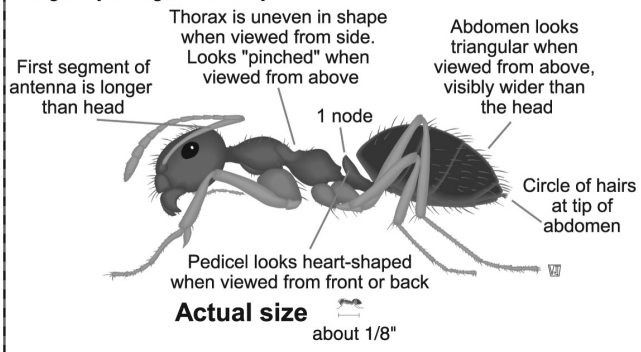
Field ants may be black, brown, tan, reddish, or red and black. Often confused with carpenter ants.



Small (False) Honey Ant

Prenolepis imparis

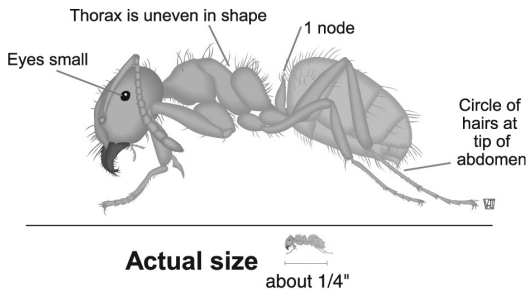
When these ants are swollen (full of food), the gasters (abdomen) are greatly enlarged and shiny.



Large Yellow Ant

Acanthomyops interjectus

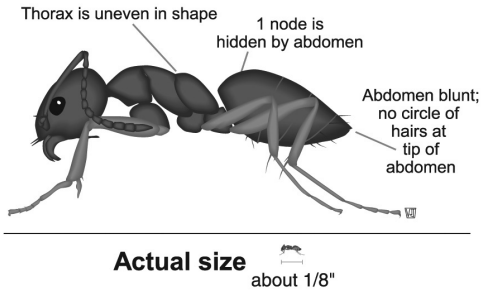
Also called citronella ant or foundation ant. Gives off "lemony" odor when crushed.



Odorous House Ant

Tapinoma sessile

Has rotten coconut-like odor when crushed.



Two-Node Structure-Invading Ants

Species	Workers	Habits/Management
Thief Ant *Solenopsis molesta*	Tiny, about 1/32 to 1/16 inch (1.0-1.5 mm); yellowish; often confused with Pharaoh ant, but has two segments in the club-like structure at the end of the antenna. Small eyes.	Often lives in association with other ants as a predator of brood; omnivorous but prefers grease or high protein foods over sweets; frequent house invader, may nest indoors in cracks and cupboards. In Nebraska it is more common than the pharaoh ant. **Management:** Treat colonies in wall voids with dusts. Baits are not effective.
Pharaoh Ant *Monomorium pharaonis*	Tiny, about 1/16 to 3/32 inch (1.5 to 2 mm); yellowish to red; often confused with thief ant, but has three segments in the club-like structure at the end of the antenna.	Nests in secluded spots and prefers temperatures of 80 - 86½ F. Pharaoh ants often are found around kitchen and bathroom faucets where they obtain water. This ant feeds on sweets but also eats fatty foods. It is predacious on other insects and will even eat dead insects. More common in warmer climates than in Nebraska. **Management:** Residual insecticides are not useful because colonies tend to split. Baiting is the preferred management strategy.
Little Black Ant *Monomorium minimum*	Tiny, about 1/32 to 1/16 inch (1.0 to 1.5 mm); jet black.	Small craters of fine soil mark nest openings in the ground; will also nest in woodwork or masonry of buildings; omnivorous, not a common invading ant in Nebraska. **Management:** Drench or dust outdoor colonies. Treat colonies in wall voids with dusts. Baits also may be effective.
Acrobat Ant *Crematogaster spp.*	Small, about 1/8 inch long (3 mm); brown to blackish. The pedicel attaches to the upper part of the abdomen. When viewed from front or back, the abdomen is heart-shaped.	Acrobat ants often tunnel and nest in wood. They have similar habits to carpenter ants and can live in decaying tree stumps. Inside they live in wall voids and door or window frames or foam insulation under siding. They may nest in wood already damaged by carpenter ants or termites. Nest locations often are associated with moisture problems and water leaks. Acrobat ants feed on honeydew and tend aphids. **Management:** Eliminate conducive moisture conditions before treating colonies. Baits are not effective.
Pavement Ant *Tetramorium caespitum*	Small workers, about 1/8 inch (2.5 to 3 mm); light to dark brown or blackish; head and thorax furrowed by parallel lines. One pair of spines on thorax and a sting on the tip of the abdomen.	This ant gets its name because it often nests under sidewalks, driveways and building foundations. A mound of displaced soil along a paved area is a sign of pavement ant activity. During the winter, pavement ants may nest inside structures near a heat source. Trailing ants feed on a wide variety of foods, including dead insects, greasy foods, seeds and sweets, as well as aphid honeydew. **Management:** Locate and treat colonies with an appropriate insecticide. Commercial baits may be effective.
Big-Headed Ant *Pheidole spp.*	Small workers, about 1/16 to 1/8 inch (1.5 to 3 mm); yellowish or light to dark brown. Two sizes of workers. Major workers have a very large head in proportion to their body.	Most common in warmer areas of the United States, but found in Nebraska. This ant primarily lives outdoors and only occasionally invades structures. Colonies have multiple queens and can be very large. Nesting is usually in the soil in protected locations, such as under rocks, logs, firewood, patio blocks, and landscape timbers, but they also will nest in open areas. Big-headed ants will construct mud tubes on foundations, similar to termite tunnels. **Management:** Treat colonies, depending on location. Using outdoor granular baits may be effective unless colonies are large.

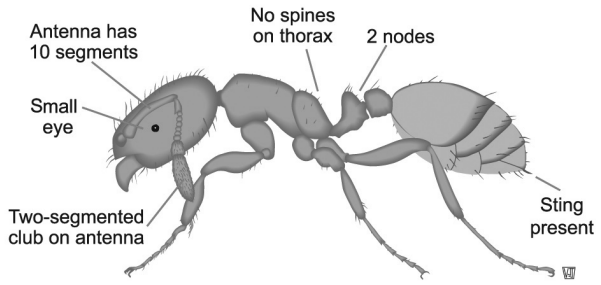
Identifying Winged Ants: Mature ant colonies produce winged ants that swarm periodically. These winged ants, called swarmers, emerge from the nest and fly off to start new colonies. When colonies are found outdoors, swarming occurs outside. Indoor swarming usually indicates the ant nest is in or under the structure. Swarming ants include females (queens) and males (kings) that look quite different from the worker ants. Compared with workers, queens are much larger and more robust; kings are skinny and much smaller than workers. Queens and kings also may be colored differently than workers, so color is not a good feature when identifying winged ants. Swarming ants have some of the key features of workers, but ant identification is most accurate with worker specimens.

Two-Node Ants

Thief Ant

Solenopsis molesta

Also called grease ant. The thief ant is most often confused with the pharaoh ant.

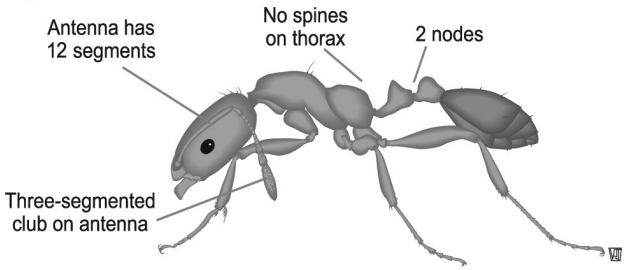


Actual size 1/32" to 1/20"

Pharaoh Ant

Monomorium pharaonis

The pharaoh ant is most often confused with the thief ant. The primary difference between the two species is the pharaoh ant has a three-segmented antennal club while the thief ant has a two-segmented antennal club.

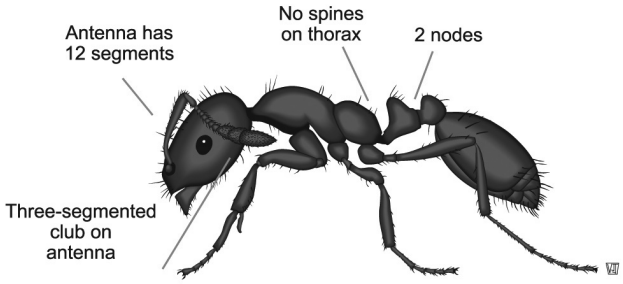


Actual size about 1/16"

Little Black Ant

Monomorium minimum

Similar in appearance to pharaoh ant except black in color.

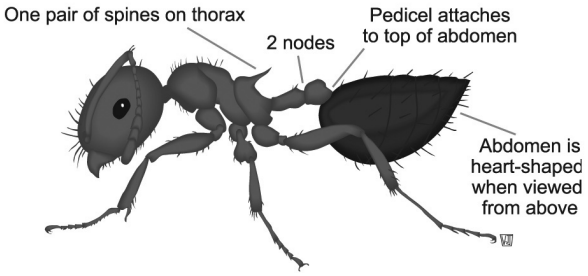


Actual size about 1/16"

Acrobat Ant

Cremastogaster spp.

Acrobat ants get their name from the habit of holding their abdomen above their thorax when the workers are disturbed.

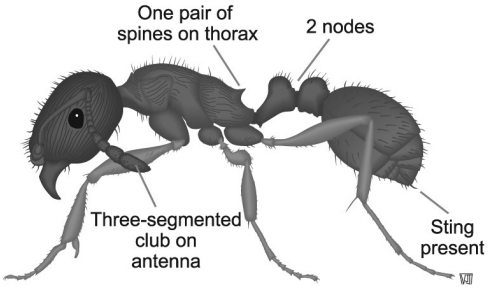


Actual size slightly longer than 1/8"

Pavement Ant

Tetramorium caespitum

Head and thorax are covered with visible grooves.

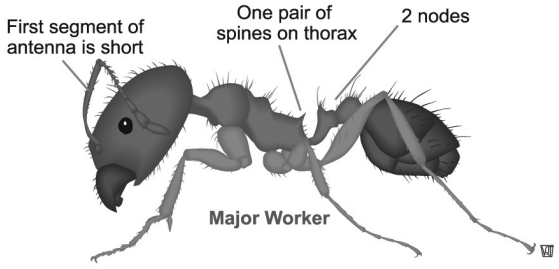


Actual size about 1/8"

Big-Headed Ant

Pheidole spp.

Two sizes of workers. Major workers have a very large head. Minor workers have heads more proportional to their bodies.



Actual size

Major workers: about 1/8" Minor workers: about 1/16"

One-Node Structure-Invading Ants

Species	Workers	Habits/Management
Carpenter Ant *Camponotus spp.*	Medium to large workers, 1/4 inch to 1/2 inch (7-15mm). Thorax evenly rounded. Workers are not all the same size. Black carpenter ants are most common, but workers of a second species, *C. sayi*, have a reddish-brown head and thorax and black abdomen. *C. sayi* is a slightly smaller species than the black carpenter ant. It is unofficially called the "red" carpenter ant to distinguish it from the black species.	Carpenter ants do not eat wood, but nest in water-soaked wood. Outdoor locations include dead tree stumps and limbs, railroad ties and firewood. Indoors, colonies are found around leaky plumbing, under windows, and in soffits, where the roof has leaked. They produce sawdust that looks like fine wood shavings, but is not powdery. It may contain foam insulation. Workers of *C. pennsylvanicus* will travel 300 feet from a colony, so finding ants inside may not mean there is a colony within the structure. Colonies consist of a primary colony that may be outdoors or where moisture is abundant. When the primary colony becomes large, workers often move part of the colony to another location. These are called *satellite colonies* and may be found in homes. Carpenter ants are most active at night, emerging after dusk and returning to their colony before dawn. Following ants may be helpful in finding the colony location. Carpenter ants make a noise that sounds like crinkling cellophane and may be heard inside walls. A stethoscope may be helpful in locating colonies in wall voids. **Management:** Eliminate moisture problems associated with interior colonies to correct conducive conditions. Treatment involves locating and treating both primary and satellite colonies.
Field Ant *Formica spp.*	Medium ants, 3/8 inch (11mm), often confused with carpenter ants. Wide variation in color: black, brown, tan, reddish, or red and black. Thorax is bumpy in appearance. Key distinguishing feature: three ocelli on head.	These ants are common around structures, but often are not found inside. Field ants are soil nesters and often construct sizeable mounds in open fields. In lawns nests have a low profile, rarely reaching above the top of the grass. They also nest under objects like rocks, landscape timbers and firewood piles. Displaced soil is often evident. Items such as stones, logs, and bricks should be overturned and inspected underneath for colonies. **Management:** Treatment of colonies includes drenching with a labeled residual liquid using a compressed air sprayer. Outdoor granular baits may be effective.
Odorous House Ant *Tapinoma sessile*	Small, 1/16 to 1/8 inch in length (1.5 to 3 mm); dark brown to black. Pedicel cannot be seen when viewed from above. Smells like rotten coconut when crushed.	Odorous house ant is the most frequent structure-invading ant in Nebraska. It nests in a wide variety of places outdoors and inside. Nests are often underneath objects, such as stones, patio blocks and debris. Inside, it prefers areas with moisture such as around hot water pipes and heaters. Odorous house ants have multiple queens. This ant forages when temperatures are cool, even down to 50½ F. A strongly trailing ant, it tends aphids for honeydew and prefers sweets in kitchens. **Management:** Treatment includes correcting conducive conditions and locating and treating colonies, which may include drench treatments, dusts in wall voids, and baits, depending on colony location.
Small Honey Ant *Prenolepis imparis*	Small, about 1/8 inch long (3 mm); golden yellow to brown. Stiff hairs on the abdomen and thorax. First segment of antenna is longer than the top of the head. Pedicel looks heart-shaped when viewed from front or back. After feeding, abdomen is swollen with food.	Small colonies. Small honey ants build nests in soil in open, well-shaded areas, seldom under items such as logs or stone. May be found in soil under shrubs and landscaping beds. The nest consists of numerous small galleries dug in the soil; excavated soil particles are deposited in a crater-shaped mound. Ants forage in easily detected trails. Active even in early spring or autumn when temperatures are well below 45½ F. This ant tends aphids for their honeydew, but may forage on sweets in the kitchen during periods when aphids are not active. **Management:** Treat colonies by injecting 1-2 ounces of liquid insecticide into nest entrance using a crack and crevice tip. Baits also may be effective.
Large Yellow Ant, also called "Citronella Ant" *Acanthomyops interjectus*	Medium-sized workers, 1/4 inch (7 mm). Easily recognized by yellow-orange color and the fact that it has an odor like citronella or lemon when crushed.	This is a soil-nesting ant. Nests are found under items, such as logs, rocks, patio blocks, porches and concrete patios, but also may be found in open areas. This ant often excavates large amounts of soil as it builds galleries. If the colony is under a concrete slab of a structure, the soil may pile on the slab. These ants swarm nearly any time of the year and may occur inside buildings when colonies are located next to or under the structure. **Management:** Drench treatments or subslab treatment can be used, depending on colony location. Baits are not effective. Vacuum swarming ants and dispose of them.

- Many ants may walk out on the stems and leaves, but eventually, they will find the bridge.
- When the trail of ants leaving the pot has disappeared, the plant can be drained and returned to its usual location.

Chemical Controls

If non-chemical methods alone prove insufficient to solve the problem, then integrating a pesticide into your management program may be warranted. Pesticides must be used in accordance with their EPA-approved label directions. Applicators must be certified to apply pesticides and should always wear protective clothing during applications. All labels and Material Safety Data Sheets (MSDS) for the pesticide products authorized for use in the IPM program should be maintained on file. Do not apply these materials when buildings are occupied and never apply them where they might wash into the sanitary sewer or into outside storm drains. When treating ants, only crack and crevice treatments with dust or bait formulations should be used. See Box 6-B for tips on controlling specific ant species.

Detergent and Water

When ants invade an area, the best emergency treatment is detergent and water in a spray bottle. This mixture will quickly immobilize the ants, and they can be wiped up with a sponge and washed down the drain. Each room, cafeteria, and food preparation area should be equipped with such a spray bottle so staff can safely deal with emergencies.

Boric Acid

Boric acid is one of the most valuable chemical control tools in an integrated program against ants. It is formulated as a dust, gel, and aerosol. It acts as a stomach poison, and since it is a general enzyme inhibitor, ants are unlikely to become resistant to this material. If kept dry, boric acid dust remains effective for the life of the building.

- When applying boric acid dust, wear a dust mask to avoid breathing the material.
- Use a bulb duster to apply a light dusting in cracks and crevices. This is superior to dusting large, open areas.
- Boric acid is approved for crack and crevice treatment in kitchen and food preparation areas.
- Boric acid can be blown with the duster into wall voids and spaces behind and under cabinets.

Diatomaceous Earth and Silica Aerogel

These are insecticidal dusts that can be used for ant control. Diatomaceous earth is made from fossilized diatoms, and silica gel is produced essentially from sand. Both kill insects by desiccation; they abrade the wax and oil from the insect's outer covering, causing dehydration and death. Although these materials are not poisonous to humans directly, the fine dust travels freely through the air and can be irritating to the eyes and lungs; therefore, use a dust mask and goggles during application.

Diatomaceous earth and silica aerogel are especially useful in wall voids and similar closed spaces. During construction and remodeling these dusts can be blown into such spaces, and in finished buildings, they can be applied by drilling tiny holes in the walls. These dusts are also useful in crack and crevice treatments. Some products combine diatomaceous earth or silica gel with pyrethrins. The pyrethrins provide a quick knock-down of the ants, and the dusts provide the long-term control.

Ant Baits

Baits greatly reduce the amount of pesticide that must be used to kill ants. Foraging ants take the bait back to the nest to feed to other members of the colony, and if the bait kills the queen, the colony will die. Even if the queen is not killed, baits will usually stop an ant invasion. If a colony has been starved by effective sanitation measures, baits will be more readily accepted.

In schools and child care centers, always place baits out of sight and reach of children or use baits at night or on weekends. Remove when children are in school.

Some ants are very susceptible to baits, some are less so. There are many reasons for these differences, only some of which we understand. If you are having difficulty in controlling your problem ant(s) with a bait, the following points may be helpful:

- It is important to correctly identify the species of ant that is invading since each species differs in its food preferences. Some baits use a sweet attractant and some use a protein or oily attractant so the bait must be matched with the ant. If you cannot determine the type of attractant by looking at the label, call the manufacturer for more information. You should also ask if the company has data to support the efficacy of their product against the ant species with which you are dealing.

Box 6-B. Tips For Controlling Specific Ants

Carpenter Ant — Carpenter ants normally build their nests outdoors in hollow trees, logs, posts, and landscaping timbers. They prefer water-damaged wood. These ants keep their galleries clean by pushing sawdust outside; a pile of sawdust underneath the nest is a sign of a colony. Carpenter ants nesting inside also need a moisture source so common nest locations include areas where wood is wet from plugged drain gutters, leaky roofs, damaged siding, leaking door and window frames, and leaky plumbing. The key to successfully managing carpenter ants is finding the colony and may require a pest control professional to do so. A thorough inspection includes looking inside and outside for colonies. Interior areas listed above should be examined carefully. Since carpenter ants are most active at night, inspections after dark may be most fruitful.

Pavement Ant — Start inspections at the ground floor or subfloor level because even if pavement ants are on upper floors, they usually originate from ground floor and outside colonies. Follow trails of ants to locate colony/colonies. Outside, trails are usually hidden by grass or mulch next to the building foundation or the edges of pavement. Inside, you can often find trails under edges of carpets along the tack strip. Pavement ants use electrical wires, conduit, and water pipes as highways throughout the building. Performing an inspection at night around 10 or 11 PM can be useful since pavement ants are most active at night, and you are more likely to find trails that will lead back to the colony. Outside, piles of soil near slabs and concrete are a good indication of underground galleries. Effective pavement ant control requires caulking cracks and crevices and placing baits in the path of ant trails near colonies. Observe carefully to ensure ants are feeding on bait. If not, change baits until you find one they will accept. Baiting is a slow control process and will take several days or longer for satisfactory treatment and will probably not eliminate the problem.

Pharaoh Ant — This is a tropical ant that likes inaccessible dark places with a relative humidity of 80 percent and a temperature of around 80°F. Workers are attracted to baits that contain protein, peanut butter oil, liquid sugars, and granulated silkworm pupae. Place the baits in door or window frames, light switches, and fuse boxes; at floor level in corners and along baseboards; near toilets, sinks, drains, heating pipes, and radiators; and in food cupboards. In warmer areas of the U.S., Pharaoh ants may nest indoors and forage outside. If you find foragers outside, place baits in areas of high activity. Use enough bait stations so that feeding will not deplete the bait before the colonies are dead. It may also be advantageous to use baits that combine 2 different attractants or use several different kinds of bait at once. A bait product for Pharaoh ants containing the insect growth regulator methoprene controls the colony because the queen is sterilized and no new larvae are produced even though the workers are unaffected. Although this kind of bait can take 10 weeks or more to kill a colony, it is a useful ant management tool.

- After setting out bait, observe closely to see if the target ant is taking the bait.
- Ant colonies have changing nutritional requirements that can pose problems in baiting. A colony that accepted a protein bait one week may be more interested in a sugar bait the next.
- The nesting and foraging environment can also affect bait acceptance. Ants nesting and foraging in dry areas will be more interested in liquid baits than will ants nesting in moist environments.
- When there are several competing ant species in one area, ants that you are not trying to control may attack your bait more readily than the pest ant, and in some cases, prevent the pest ant from getting to the bait.
- Do not spray pesticides when using baits. Bait stations contaminated with pesticide are repellent to ants, and sprays disperse the ant infestation, making it harder to place baits effectively.
- Place bait stations along foraging trails but do not disturb ant trails between the nest and the bait. Killing the ants or disturbing the trails prevents the ants from taking

enough bait back to the colony to kill nest mates.

- Do not put out bait until you have an ant problem. If you use baits preventively, you may attract ants into the building.
- Some baits come packaged in plastic disc "bait stations" that come with double-sided tape so they can be glued to various surfaces out of view. It is important to remove bait stations once the ant problem is under control because they are ideal harborage for cockroaches. Likewise, if there is bait left in them, it may eventually attract ants back into the building. Other baits come in granular or gel formulations that can be injected into wall voids through small holes. Gel baits can also be placed near ant trails in unobtrusive places where they will not be disturbed.

Resources

For management practices and pesticide recommendations on ant control, see the publications available from UNL Extension on-line at: *http://www.ianrpubs.unl.edu*.

Educational resource guides and an ant photo gallery are available at: *http://lancaster.unl.edu/pest/ants.shtml*