

RED IMPORTED FIRE ANT

Integrated Pest Management for Home Gardeners and Landscape Professionals

Although the red imported fire ant (*Solenopsis invicta*) is common in 12 southern states, it is new to California and has recently been found infesting numerous residential and commercial areas in Orange, Los Angeles, Riverside, San Bernardino, and to a lesser extent, San Diego counties. The spread of these ants has largely been a result of the movement of infested soil to uninfested areas.

IDENTIFICATION

Red imported fire ant workers (Fig. 1) are variable in size ($\frac{1}{16}$ to $\frac{1}{5}$ inch long) and dark reddish brown. Unlike our native southern fire ant (*Solenopsis xyloni*) and harvester ant (*Pogonomyrmex californicus*), the red imported fire ant can quickly produce many nests and colonize a yard. Harvester ant workers are all the same size ($\frac{1}{5}$ inch long) and are red in color. Many people refer to these as "red ants." The most common ant around homes in California is the Argentine ant, *Linepithema humile*, a small grayish black ant that is uniform in size ($\frac{1}{10}$ inch long) and is seen moving along in long trails. While there are several physical characteristics that distinguish red imported fire ants from other common ant species found in California, one way to recognize this pest is to observe its aggressive behavior when its nest or food source is disturbed or to experience its painful bite and sting.

In areas that are not disturbed, red imported fire ants typically make dome-shaped mounds (Fig. 2) that are about 18 inches across and about 8 to 12 inches tall. They resemble large gopher mounds or look like crumbly earth with small holes; these mounds readily distinguish red imported fire ant colonies from other California ant colonies. Nests of the native southern

fire ant, for instance, are usually irregular and consist of scattered soil with multiple obscure entrances. Unlike the other ant species mentioned, red imported fire ants tend to build nests in open, sunlit, grassy areas that are typically irrigated. They will readily run up any object that touches their mound, whereas the other species are much less aggressive. Because red imported fire ants often build their nests in turfgrass areas in California, frequently the mounds have been mowed and are nearly flat, appearing as soft, loose dirt that obscures the grass and looks like a bald spot in the turf.

In some instances red imported fire ants do not build mounds but nest in places such as rotten logs, walls of buildings, or under sidewalks.

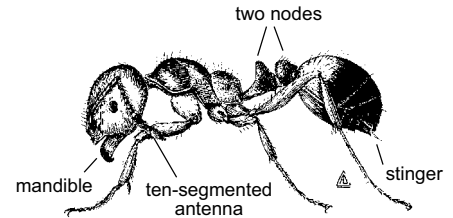


Figure 1. Adult red imported fire ant worker.

LIFE CYCLE

The fire ant life cycle, like that of other social Hymenoptera (ants, bees, and wasps), consists of four main stages: egg, larva, pupa, and adult (Fig. 3). The egg, larval, and pupal stages occur within the underground nest and are only seen when nests are disturbed or when they are being carried to a different location by workers. The eggs are almost too small to be seen with the unaided eye. They hatch into the

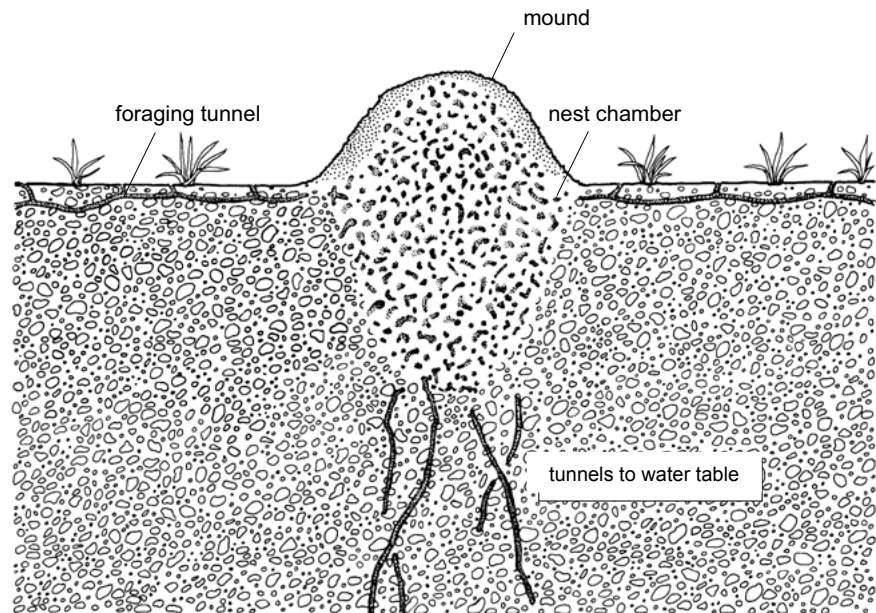


Figure 2. Cross section of a red imported fire ant mound.

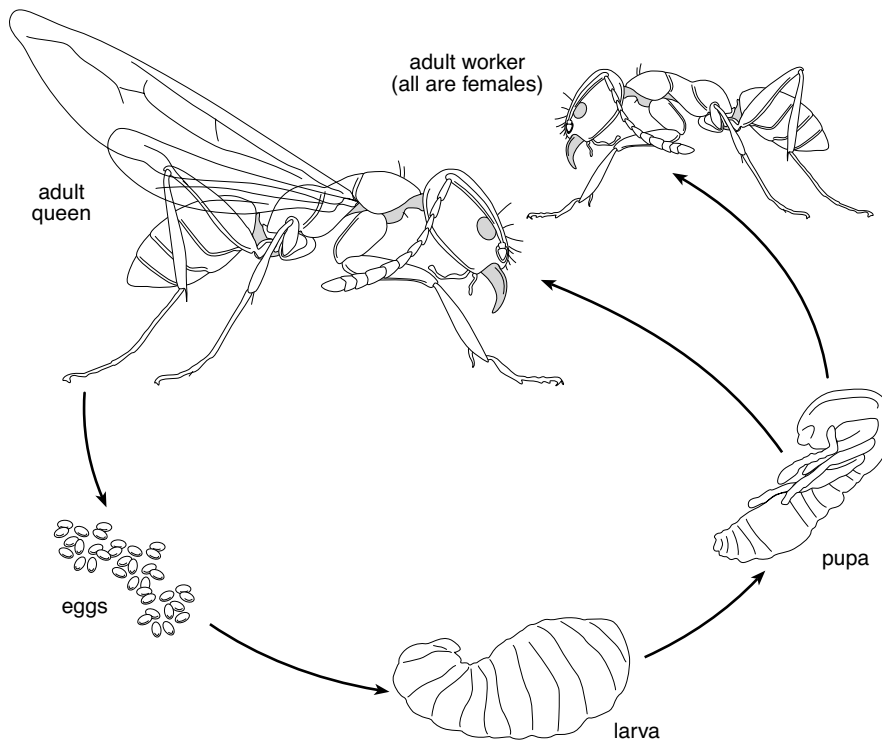


Figure 3. Life cycle of the ant.

grublike larvae that are fed by the workers. There are four larval instars (stages); the fourth larval instar is particularly important because it is the only stage that can ingest solid food. Once the larvae finish their growth, they molt into pupae, which look like adults except that their legs and antennae are held tightly against the body. These pupae are initially white, but begin to turn darker as they mature. In the final molt the pupa becomes an adult.

Most larvae develop into sterile worker ants, all of them female and wingless. However, some larvae in the colony receive extra food during their development and become much larger than the larvae destined to become workers. These larger larvae will develop into reproductives. Large numbers of reproductives are normally produced once a year in the spring in preparation for a mating flight, although flights can occur more than once a year if conditions are favorable. The female reproductives are future queens and have wings. Male larvae develop into winged adult males that are black in

color and have a smaller head and larger thorax than female reproductives. During a mating flight, the winged males and females fly and mate in midair before falling back to the ground. Males die shortly afterward; the mated queens remove their wings and dig a small hole in the soil and seal themselves inside. In the nest, the queens begin to lay eggs that develop into small worker ants in a month or two.

Some fire ant colonies have only one queen per nest and are called "monogyne" colonies. Others can have many queens and are called "polygyne" colonies. The polygyne colony may be more difficult to control because all the queens must be killed to prevent the colony from surviving. Polygyne colonies frequently expand by "budding"; i.e., some of the queens and workers start a new mound nearby. This process accounts for much higher mound densities for polygyne colonies than for monogyne colonies, sometimes approaching 1,000 mounds per acre.

DAMAGE

The red imported fire ant's sting is a serious concern to people and their pets. Venom injected into the skin causes a burning sensation (hence the name "fire ant"). Both southern fire ants and red imported fire ants become very agitated when their nests are disturbed, but red imported fire ants are much more aggressive and can quickly climb onto the object or person causing the disturbance and begin stinging. A single red imported fire ant can bite and sting its victim repeatedly (Fig. 4). Symptoms start as a burning and itching sensation followed by the formation of a white pustule, which takes several weeks to disappear. The pustules can become infected if not kept clean and may leave permanent scarring.

A small percentage of the human population is allergic to these stings. If a person experiences chest pains, nausea, dizziness, or shock, they should seek emergency medical assistance immediately after a stinging incident. Avoid medical emergencies by teaching children and visitors about fire ants.

Fire ants feed on almost any plant or animal material, including other insects, ticks, ground-nesting animals, young trees, seedlings, plant buds, developing fruits, and seeds. In addition to their stings, the red imported fire ant causes problems by building its nests around trees, yard plants, pipes, and in the walls of structures. Colony-building can damage plants, lawns, and outdoor electrical fixtures.

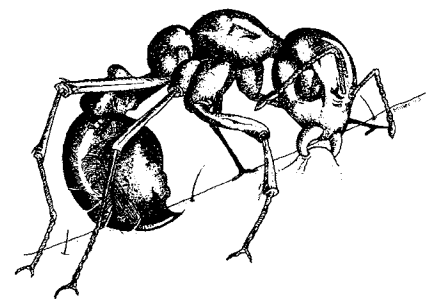


Figure 4. A red imported fire ant attack involves both a bite and a sting.

MANAGEMENT

Because fire ants can sting en masse, most people will want to keep them off their property. This contrasts with other common ant species, such as the Argentine ant, where the primary goal is to keep them out of homes. For management of household ants, see *Pest Notes: Ants*, listed in References.

The red imported fire ant is a quarantined pest in California. If you suspect that the pest is on your property you can call a statewide toll free number that has been set up by the California Department of Food and Agriculture (CDFA) (1-888-4fireant or 1-888-434-7326) to help get the pest identified by someone in your area. There is also an informative Web site, <http://www.fire-ant.ca.gov>. If you are in an area where the fire ant has not been previously established, contact CDFA for help and do not attempt your own control program. In southern California's Orange County and in the Coachella Valley,

the Vector Control Districts have active fire ant eradication programs and will assist residents with treatment. In Los Angeles County, the county agricultural commissioner may provide treatment in some areas. In other areas and in Riverside County, residents may be responsible for their own treatment. Hiring a licensed pest control operator is strongly recommended because licensed professionals have access to the most effective management products and experience in controlling this pest.

For professionals and residents carrying out their own management programs, ant baits are recommended because they are inexpensive, highly effective, and safe for the environment. Table 1 shows many bait products labeled for use against fire ants in California.

Using bait allows the foraging ants to carry the poison back to the nest and

the rest of the colony. Most fire ant baits consist of a matrix of de-gelled corn grits that are coated with soybean oil containing the toxicant. Baits should be put out when ants are seen walking on the ground (temperatures from 70° to 90°F are best). In hotter weather, baits are best applied in the evening. They will then forage overnight on the bait. Baits lose their effectiveness quickly with extreme heat, water, and sunlight. Fresh bait from an unopened container works best; an opened package may remain fresh for only a couple of weeks. Furthermore, the ground should be dry to avoid further deterioration of the baits. On watered turf, in most cases a couple of hours without irrigation should be sufficient to allow the ants to take the baits to their nests. Also, do not apply baits if rain is expected. Fire ant baits are broadcast at 1.5 lbs per acre and are unlikely to pose a threat to people or animals at these rates of applications. Labels should be carefully followed with regard to where and

Table 1. Common bait insecticides for fire ant control available in California 2006.

<u>Active ingredient (a.i.)</u>	<u>Product name</u>	<u>Availability</u>	<u>Speed of control</u>
hydramethylnon	Amdro	Homeowners	moderate to slow
	Maxforce Fir Ant Killer Granular Bait	Professional Use Only	moderate to slow
abamectin	Ascend	Professional Use Only	moderate to slow
	Enforcer	Homeowners	moderate to slow
fipronil	Ceasefire	Professional Use Only	moderate to slow
pyriproxyfen	Distance	Professional Use Only	slow
	Spectracide Fire Ant Killer	Homeowners	slow
spinosad	Conserve	Homeowners	moderate to slow
methoprene	Extinguish	Homeowners	slow
	Extinguish Plus	Homeowners	slow
fenoxycarb	Award Fire Ant Bait	Professional Use Only	slow
indoxacarb	Advion	Professional Use Only	data unavailable
	Spectracide Fire Ant Killer Plus Preventer Bait	Homeowners	data unavailable

when these baits should be applied and special care taken to avoid applying on hard surfaces or washing baits into storm drains.

For long term control a bait containing an insect growth regulator (IGR), such as Distance, is recommended. However, IGRs are slow acting, requiring 4 to 6 weeks for maximum efficacy. If quicker results are desired, a corn-grit bait containing hydramethylnon, such as Amdro, can be used. It will give good results within one week or less. Table 1 lists common bait products available for controlling ants. Many of these are available only to licensed professionals.

Mound treatment and broadcast granules such as products containing cyfluthrin, deltamethrin, pyrethrin, acephate, d-limonene, permethrin,

bifenthrin and lambda-cyhalothrin are not recommended. These products may give a quick reduction in visible ants, but they generally kill only foraging workers and do not give good long-term results in reducing the colony. One exception is a broadcast granular product containing fipronil. All of the mound treatment and broadcast granule products mentioned above have greater potential of running into groundwater than do the baits, and all the pyrethroid products have been found in urban creeks at levels toxic to aquatic wildlife. Fipronil also poses hazards to aquatic wildlife. If you hire a pest control operator, the merits of the different treatments with respect to efficacy and safety for the environment should be discussed before treatments are done. (See *Pest Note: Hiring a Pest Control Company* in References for information on hiring a professional.)

lif. Agric. Nat. Res. Publ. 7411. Also available online, <http://www.ipm.ucdavis.edu>.

UC Statewide IPM Program. Mar. 2006. *Pest Notes: Hiring a Pest Control Company*. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 74125. Also available online, <http://www.ipm.ucdavis.edu>.

Vinson, S. B. 1997. Invasion of the red imported fire ant (Hymenoptera: Formicidae): Spread, biology, and impact. *American Entomologist* 43(1):2339 ❖

For more information contact the University of California Cooperative Extension in your county. See your telephone directory for addresses and phone numbers.

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To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

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REFERENCES

Drees, B. M. 2006. *Managing Red Imported Fire Ants in Urban Areas*. College Station, TX: Texas Agricultural Extension Service.

Drees, B. M., C. L. Barr, D. R. Shanklin, D. K. Pollet, K. Flanders, and B. Sparks. 1999. *Managing Red Imported Fire Ants in Agriculture*. College Station, TX: Texas Agricultural Extension Service.

UC Statewide IPM Program. Feb. 2007. *Pest Notes: Ants*. Oakland: Univ. Ca-

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down sink or toilet. Either use the pesticide according to the label or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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