FIRE ANT - GENERAL OVERVIEW
Solenopisis spp.

After World War II, the spread of these fire ants was largely due to the sale of grass sod and woody ornamental plants used in landscaping. Fire ants include a large group of reddish-brown to black ants that normally spread by one of the following methods: seasonal relocations, migration in nursery stock, natural flights, and after floods rafting on water. Ants can be blown by the wind 12 miles during mating flights. They can "hitchhike" on birds or mass together to form a floating ball to ride out a flood. Fire ant workers are sterile females that range in size from .08" to .2" in length. The larger workers are called majors, the medium sized are called medias and the smallest size are called minors. All of the workers sting and inject a venom that causes blisters and allergic responses, including possible anaphylactic shock. A single fire ant can grab hold with its mandibles and then whip its abdomen down and sting multiple times, injecting the poison each time. They are now found in 11 southeastern states and over 33,000 people a year in the U.S.A. seek medical attention from fire ant stings. A fire ant mound can be 15" - 24" in diameter and 10" - 18" high and 1' - 3' deep with some tunnels extending 5' or more down to the water table and can contain 80,000 to over 250,000 workers. **A.K.A. the six-legged scourge of the South. Note: They are adapting to the cold and coming North. Talcum powder will repel them.**

Fire ants are omnivores and will eat plant and animal material including mice, turtles, snakes, and other vertebrates, crops, plants, saplings, wildflowers, fruit, and grass but prefer insects. U. S. fire ants readily defend their mound. Disturbed or injured workers release alarm pheromones. There are four major species, two native and two imported, found in the U. S. from the Carolinas to California. Mating between the winged forms or alates takes place 300' to 800' in the air, usually in late spring or early summer. The males fly up first and wait for the females, after mating, the males die and the newly mated queens seek moist areas, normally within one mile of the mother colony. If the female lands on a suitable moist site, she removes her wings and digs a small burrow in the soil and then seals it. Within 24 hours the queen begins laying eggs, normally only 10 - 15 in the first cluster. The queen ant can live up to 7 years and will produce up to 1,500 to 1,600 eggs per day throughout her life. Queens are the first to be fed proteins, so any fire ant bait has to be protein-based. Fire ants feed on honeydew, sugars, proteins, oils, seeds, plants and insects. Fire ants frequently enter and nest in houses and are attracted to water and electrical wires and their associated magnetic fields or impulses. They can ruin gas pumps, transformers, traffic lights, air conditioners, heat pumps and other electrical equipment. Locate ant activity inside by watching the ant trail and follow back to the void and treat with ant baits or dusts or diluted Kleen 'Em Away Naturally® or Safe Solutions, Inc. enzyme cleaners and peppermint soap, 2 ounces each per quart of water. They will kill plants by feeding on seeds or by girdling freshly planted nursery stock. Fire ant workers compensate for changing conditions, e.g., temperature and humidity by moving the larvae and queen to suitable locations within the mound. On cool mornings in the summer the queens are near the top of the mounds where it is warmer; as the day heats up the queens go deeper into the soil.

Note: Fire ants are tick predators - normally yards with fire ants also do not have ticks. If you have no ticks there, obviously, is less danger of disease. They also control the ground stage of horn flies. One simple non-toxic fire ant control is to simply drive over the nests repeatedly with your car or truck; repeat as often as needed. Try dusting with talcum powder or Comet®. Only undisturbed forested areas remain virtually fire ant free. Fire ants must have sun energy to exist. Cloudy, cool days in early morning or late afternoon, in fall, winter and/or spring are the best times to kill fire ants. Spring is the best time to try boric acid baits mixed in sugar, jelly or pet food. **Try flooding nesting sites with copious amounts of diluted Kleen 'Em Away Naturally® or Safe Solutions, Inc. Enzyme Cleaners or Peppermint Soap or Not Nice to Bugs® or with 1 gallon of orange juice and 2 gallons of water and a dash of peppermint or dish soap.**

FIRE ANTS - a.k.a. Red Ants
The National Park Service has noted that fire ants are so called because their fiery venom, they latch on with barbed mandibles and sting repeatedly with spiked tails, their venom is injected by a stinger like a wasp's, and creates a burning sensation and a small bump or pustule within 8 - 24 hours that can last for 10 days! Fire ants in the U. S. are active and aggressive, swarming over anyone or anything that disturbs their nest, be it wild animals, domestic animals and birds, pets or people. An encounter with a fire ant nest can leave a lasting memory of burning pain, followed by tiny, itching pustules, especially *Solenopsis invicta,* and sometimes even more severe reactions includ

ing anaphylactic shock. Fire ants are also identified in the U. S. by their reddish-brown to black color, small size (1/8" - 1/4" long) and by distinctive swarming behavior when their nest or mound is disturbed. **See all of the individual fire ant species in this chapter.**

Because of this, and occasional news stories of livestock or people killed by multiple fire ant stings, people fear fire ants. In some areas infested with certain species of fire ants, lawns, school yards, river banks, athletic fields, mulched areas, compost piles, playgrounds, parks and picnic areas lie abandoned, unused because of the medical threat caused by the presence of fire ants. In campsites of state and national parks in fire ant infested areas, it is often difficult to put up or take down a tent without being stung by angry fire ants. In the U. S., they will storm anything that threatens their mound or that looks like food, whether it be old people, crawling babies, injured waterfowl, newborn rabbits and fawns, bedridden hospital patients, or you just walking along. The University of Florida and Eckerd College have begun a 2-year study of the Red Imported Fire Ant and its negative effects on endangered species in the Florida Keys including the Lower Keys marsh rabbit, the Stock Island tree snail and nesting green sea turtles - they are finding no island is safe.

Daniel Wojcik, an adjunct UF/IFAS scientist and a research entomologist with the USDA's Agricultural Research Service, said fire ants are very adaptable and do well in both sandy and mild soils, and in the mucks of the Everglades. They are often found along beaches, which surprises many people, Wojcik said. "People will have to learn to deal with fire ants over the long-term. The days of massive chemical treatments, I think, are pretty much over," Wojcik said. "We are working on introducing a number of organisms from South America to provide biological control for fire ants, maybe some diseases of the ant, some parasites, and probably eventually some predators. But none of those things are going to be the golden bullet."

Fire ants are pests in other ways besides their stinging. They are attracted to the AC and DC currents in electrical appliances. They can destroy or damage crops such as soybeans, blueberries, peanuts, sunflowers, watermelons, canteloupes, cucumbers, pecans, eggplant, corn, okra, strawberries, and potatoes by feeding directly on the plants and/or by protecting other insects that damage the crops. The fire ants may feed on plant seedlings and germinating seeds causing crop damages. They chew the bark and growing tips of citrus trees and feed on the fruit. (Stop their climbing with bands of Tanglefoot® or Vaseline®.) Fire ant mounds can break equipment and interfere with farming and mowing operations and turn ornamental turf and recreational fields into aesthetically disfigured moonscapes. Fire ants have caused sections of roads to collapse by removing huge amounts of soil from under the asphalt. Fire ants can nest in air conditioners, traffic lights and other electrical connections, often causing disruption of service. (They can be quickly removed if you carefully vacuum them out - put 1 tablespoon of talcum powder or cornstarch in your dry vac bag or some diluted enzyme cleaner in your wet vac.) **They are especially partial to sun and sandy soil.**

Beginning in the late 1950's, when the federal government first declared war on fire ants, stating it would attempt to wipe out *S. invicta* once and for all. World War II-era bombers dusted millions of acres in the South with the highly poisonous pesticides dieldrin and heptachlor. Some fire ants died, but so did birds, fish, raccoons, opposums, dogs and cattle. The bird population declined over 85% in Texas and Louisiana. When the program was finally halted, the government had spent $70 million, all in vain. Before the campaign, *S. invicta* had only infested 90 million acres; five years later, they had spread to 126 million acres! In 1958, the Federal Fire Ant Quarantine was implemented try to limit the spread of fire ants from quarantined areas. Hay, sod, plants and used soil moving equipment must be inspected and/or treated before being moved out of the quarantine area. **USDA, APHIS and PPQ mandate plants must be pest free but do not dictate treatment strategies - Flood or spray with diluted enzyme cleaner or dust with talcum powder.**

Frustrated but undaunted, the feds spent another $200 million in the 1960's for a new war (poison) effort, with similar dismal results. A survey conducted in 1981 showed about 1 million households were using insecticide poisons and other controls including gasoline trying to eradicate fire ants (Headley 1982). Today there are 157 chemical (poison) formulations *registered* for the control of fire ants - but none of these volatile, synthetic pesticide poisons has ever stopped their spread. **Today the fire ant epidemic infestation count is over 300 million acres in the U. S. and Puerto Rico - and the number is growing!** At the time of this writing fire ants were found in Florida, Georgia, South Carolina, North Carolina, Tennessee, Alabama, Arizona, New Mexico, Mississippi, California, Louisiana, Arkansas, Texas and Oklahoma.

Fire ants have developed a unique method to keep from drowning. At first hint of rising water, worker ants gather the

entire colony into a ball - sometimes as big as a basketball. As the water overtakes the mound, the ball rides the flood like a living raft, rolling in the water so all the members can take turns breathing. When they strike a solid object, be it a swimming dog or your canoe, they quickly swarm aboard. **If sprayed or baited with diluted enzyme cleaners they will quickly die.**

Increasingly, fire ants have also been found nesting in water meter casings, computrs, t.v.'s, wall voids, around plumbing, and under carpeting in structures. Their presence inside can threaten pets, children and sleeping or bedridden people. You can usually quickly control them with diluted enzyme cleaners or carbon dioxide or aerosol foam insulation or steam them with a Vapor Dragon®. The ants have also been found invading and chewing on insulation on wiring and moving soil into these areas causing power failures in outdoor electrical equipment, apparently attracted (like many ants) to the electrical fields or impulses. Infested sites include household electric meters, air conditioning units, traffic signal control boxes, and even airport runway lights. Where you can not safely use diluted enzyme cleaners or steam or aerosol foam insulation, you can spray them with WD40 or carefully vacuum them up or you can follow foraging ant trails (at night if needed, with a red light) to the nesting area and then you can treat these areas with talcum or medicated body powder or food-grade DE or Comet® cleanser, or you can use some bands of Vaseline® or Tanglefoot® to trap them or keep them out. The Solar Ant Chamber™ takes advantage of the fire ants' attraction to electrical impulses. Call them at 1-800-472-5024 and ask how the cone that is pushed into the mound uses sunlight to kill fire ants.

Fire ants are mainly beneficial insects - when they are left alone - because they are truly voracious predators that feed on pests such as fleas, filth breeding flies, horn flies, boll weevils, sugarcane borer, ticks and cockroaches. The Imported Fire Ant is credited with having dramatically reduced the range of the Lone Star Tick, a serious livestock pest. When left alone, this also may deter multiple-queen colony formations.

In the South, during the summer, usually after a rain, hundreds of winged fire ants will ascend from their mounds to mate 300-800 feet in the air. The males quickly drop to the ground and die, their only purpose in life fulfilled. The females, now queens, drift downward to start new colonies; on a windy day, this may be as far as five miles away. The queens burrow into holes and begin laying eggs. Two months later there will be several thousand, each queen capable of laying 1,500 to 1,600 eggs a day. In a year, a new colony can be 100,000 strong. A mature colony can contain over 4000,000 ants. The process can repeat up to eight times each summer, spreading the ants 20 to 30 miles a year. There can be 35 million ants per acre that are constantly foraging and will eat anything that sits still for less than a minute - they will find it, kill it if they can, and then try to eat it.

BIOLOGY AND IDENTIFICATION OF FIRE ANTS
Tribe Solenopsidini, Subfamily Mymicinae

Pest Species of Fire Ants — The "Ant from Hell"

There are many species of fire ants in the United States, but the most serious U. S. fire ant pests are four in the genus *Solenopsis:* the Red Imported Fire Ant, the Black Imported Fire Ant, the Southern Fire Ant, and the native fire ant. Distinguishing between imported and native species of fire ant is difficult, even for experts. Identification usually requires 40 or more randomly collected worker ants for study. The following sections briefly discuss the four fire ants of major concern in the U. S. The Little Fire Ant is described later in the chapter.

Red Imported Fire Ant, Subfamily - Mymicinae

Introduced from western Brazil (Argentina or Paraguay), this fire ant species quickly and usually becomes the number one fire ant pest wherever it occurs. The main reason for this is when it was introduced into the U. S. about 60 years ago its natural enemies were left behind in South America. Since 1958, many hundreds of millions of dollars have been uselessly spent and many thousands of chemical poison compounds have been evaluated for delayed toxicity against just this ant by the USDA Agricultural Research Service. Nothing has stopped its spread. **The Red Imported Fire Ant, *Solenopsis invicta* - (Buren)***,* is associated with disturbed habitats, mostly created by humans, and is abundant in old fields, pastures, lawns, roadsides and many other open sunny areas. It often inhabits fields used for agricultural purposes where its large above-ground mounds create problems in planting and harvesting crops. John Morrison, Jr., et al, 1997, noted that Red Imported Ants will feed on wheat, corn and sorgham seed and to some extent on dry cotton and soybean seeds under laboratory conditions. In areas where grass is periodically cut, mounds are flush with the ground and are hard to see. This fire ant species is rarely found

in mature forests and other areas with heavy shade, unless part of the area has been disturbed or opened by fire or storms. They prefer open sunny areas, e.g., pastures, lawns, meadows, cultivated fields and parks. *Solenopsis invicta* has the most toxic venom of all U. S. fire ants.

The Red Imported Fire Ant builds mounds that are, on average, 10" - 24" in diameter and 18" high. But larger fire ant mounds are not uncommon. They also may extend 6' underground. They also build soil tubes on foundations of buildings. The primary function of mounds, beyond that of the simple ground nests of other ants, is microclimate regulation - controlling the temperature and humidity. The ants can maintain a temperature inside the mound much higher than that outside, allowing them to continue colony growth even during cool weather. They have a filtering system that admits only liquids into their digestive systems that even removes bacteria (e.g. *Bacillus thurmingiensis*) - so feed them sugar water with 1% boric acid or .5% Disodium Octoborate Tetrahydrate for 8 weeks. Originally it was incorrectly identified as *Solenopsis saevissima richteri* (Forel).

The fire ant mounds are symmetrical piles of excavated soil, rich in organic materials, laced with interconnected galleries and chambers. The soil below ground also contains galleries and chambers. During foraging periods only a small percentage of ants may be inside the mound; the rest are out gathering food. **That is why there are times of the day or night that flooding or drenching mounds are more effective.**

A newly mated queen lays about a dozen eggs. When they hatch 7 to 10 days later, the larvae are fed by the queen. Later on, a queen fed by worker ants can lay up to 800 eggs per day. Larvae develop 6 to 10 days and then pupate. Adults emerge in 9 to 15 days. The average colony contains 100,000 to 500,000 workers and up to several hundred winged forms and queens. Queen ants can live 7 years or more, while worker ants generally live about 5 weeks, although they can survive much longer.

A newly established fire ant mound or nest rapidly produces young workers, and winged reproductives are produced for most of the year (8-10 months), much longer than the native species. Red imported fire ants quickly spread through a suitable habitat, and the species is now found throughout most of the southeastern United States and west into Texas and California (over 300,000,000 acres in the U.S.A.). They can and quickly do latch onto your flesh with barbed mandibles and sting repeatedly, pivoting in tiny circles until you, the victim can repel them or dies. **The venom burns like a hot match and causes tiny blisters or white pustules that persist for days if left untreated or for weeks if scratched or infected and may leave permanent scars.** Red imported fire ants have two types of colonies. Single-queen (monogyne form): only one queen per colony or mound; slightly larger workers; members of colonies are territorial; mound densities usually 20 - 80 mounds (up to 150 mounds) per acre; up to 7 million ants per acre. Multiple-queen (polygyne form): dozens of queens per colony; smaller average worker ants; colonies are interconnected; mound densities of 100 to 1000+ per acre; up to 40 million ants per acre. Bait with raw fish, canned sausage, maple syrup (treated with boric acid or sodium borate 2% - 5%) or a combination of vitamin C and baking soda.

Black Imported Fire Ant

The Black Imported Fire Ant, *Solenopsis richteri* (Forel), is very similar to the Red Imported Fire Ant. It is currently limited to a small area of northern Mississippi and Alabama. It may be displaced from established habitats by the Red Fire Ant. The Black Fire Ants come here from Argentina and/or Uruguay.

Scientists have long thought that the Black and Red Fire Ants were two distinct species. Recently it has been discovered that hybrids of these ants produce viable offspring, and some scientists now wonder whether they are simply two races of the same species, varying only in color and perhaps behavior and/or have created hybrids.

Southern (California) Fire Ant

The Southern Fire Ant, *Solenopsis xyloni,* (McCook) is a native species that occurs from North Carolina south to northern Florida, along the Gulf Coast and west to California. Colonies may be observed as mounds or more commonly may be constructed under the cover of stones, boards, and other objects or at the base of plants. These ants also nest in wood or the masonry of houses, especially around heat sources such as fireplaces. Nests often consist of loose soil with many craters scattered over 2 to 4 square feet. In dry areas nests may be along streams, arroyos, and other shaded locations where soil moisture is high. Southern fire ants usually swarm in late spring or summer.

Fire Ant (Tropical or Native fire ant)

The fire ant, *Solenopsis geminata* (Fabricus), is a native species sometimes called the Tropical Fire Ant. This ant ranges from South Carolina to Florida and west to Texas. Very similar to the Southern Fire Ant, this native fire ant usually nests in mounds constructed around clumps of vegetation, but may also nest under objects or in rotting wood.

The Fire Ant Colony and Life Cycle

The life cycles of the four described fire ant species are all very similar.

Development of the individual: Like all ants, an individual fire ant begins life as an egg, which hatches into a legless, grub-like larva. The larva is very soft and whitish in color. It is also helpless and depends totally on worker ants for food and care. The fire ant larva is specialized for feeding and growing, and almost all growth occurs during this period. As in all insects, growth is accomplished by periodic molting, or shedding of the cuticle (skin) **using an enzyme zipper**. Having reached its final size, the larva becomes a pupa in which various adult structures, such as legs, and in some cases wings, become apparent for the first time. The fire ant pupal stage is the transitional stage between the larva and the adult that emerges during the final molt. In insects in general, the adult stage is specialized for reproduction and dispersal; with ants, some adult individuals are capable of reproduction (queens and kings) and the remainder are sterile workers.

The fire ant colony: The social unit of fire ants contains several hundred to several thousand related members depending on the age of the colony. Colonies, like individuals, pass through a characteristic life cycle. New colonies do not make a conspicuous mound for several months. Older colonies may have mounds up to 3 feet in diameter. Mounds are usually found in open sunny areas such as lawns, pastures and fields, but may also be found in logs, around trees and under pavement. There may be 20 to several hundred mounds per acre. Occasionally fire ants can be found nesting on the roof or debris on the roof or in an electric receptacle, but most often they are found in the ground. There are several pheromones used by fire ants; the key recruitment chemical is an alpha-farnesene which is supplemented by 2 or 3 other chemicals.

Fire ants feed on many things, including insects: body oils, soiled linen, oil from seeds, meats, grease and honeydew. The adult ants cannot eat solid food, and must extract or liquefy the food source. This is done by feeding juveniles the solid food; the juveniles turn it into liquid food which can be regurgitated. This liquid food is passed to the other ants in the colony including the queen, the workers and the developing young ants or brood. Any bait used, therefore, must be extremely slow acting. Worker ants search for food up to 100 feet away when the temperature is between 70° F. and 90° F. during the day or night. When temperatures exceed 95° F., fire ants only forage at night. **Their foraging tunnels can be 50 - 100 feet long.**

Fire ants are very typical of ants in general. In addition to workers and a queen, mature colonies contain males and females capable of flight and reproduction. These individuals are generally called “reproductives.” The average colony can produce about 4,500 reproductives per year. On a warm day, usually one or two days following a rain, the workers open holes in the nest through which the reproductives exit for a mating flight. Mating takes place 300' to 800' in the air. Mated females (are attracted to shiny surfaces) descend to the ground, up to 12 miles away, break off their wings, and search for a place to dig the founding nest, a vertical tunnel 2" to 5" deep. They seal themselves off in this founding nest to lay eggs and to rear their first brood of workers. During this period they do not feed, instead utilizing reserves stored in their bodies. The first worker brood takes about a month to develop; these are the smallest individuals in the entire colony cycle. Fire ants open the nest, begin to forage for food, rear more workers, and care for the queens. Hereafter, the queen or queens essentially become egg-laying machines, each able to lay up to 1,500 to 1,600 eggs per day and can live 2 - 7 years. If the colony is disturbed, the workers swarm over the mound for 8 minutes; if the disturbance continues, the workers will quickly carry the queen through underground tunnels so she can begin a new colony.

Multiple fire ant queen colonies are fairly common. A single colony may have 10 to 300 or more queens, each reproducing. Multiple queen colonies can mean up to 10 times more mounds per acre. The fire ant queens generally mate several times and may live for up to 6 - 7 years. Workers are less long-lived and usually will not survive an entire season. **Each queen can lay from 1000 to 1500 eggs a day for up to 7 years!**

The fire ant colony grows rapidly by the production of workers that gradually enlarge the original vertical tunnel into multiple passages and chambers. Colony maturity is attained when fire ant reproductives are once again produced. The reproductives leave to mate and form new colonies. A mature colony of Red Imported Fire Ants can produce as many as 4,500 reproductives during the year in 6-10 mating flights between spring and fall. Mating flights usually occur about 1 - 2 days after a rain on warm, sunny days about 10 a.m. Nearly 100,000 queens may be produced per acre in heavily infested land, but mortality rates, mostly from natural predators, can reach 99%.

Fire ant colony size: Colonies of Red and Black Imported Fire Ants become territorial as they grow; they defend their territory area against all other fire ants. Therefore, fire ant colony populations often reach an upper limit depending on the territory size of mature colonies. A typical figure for pasture land seems to be about 20-50 mounds or more per acre in single queen nests and up to 250 mounds or more (up to 700) in multiple queen nests. Mature colonies of Imported Red Fire Ants consist of an average 80,000 workers, but colonies of up to 200,000 to 400,000 and more have been reported.

Fire Ant Feeding Habits

The oldest and most expendable 20% or so of the colony's fire ant workers leave the nest to search for food. They explore 50-100 feet from the nest with an efficient looping pattern. They can gnaw on soiled clothing. Although the worker ants can chew and cut with their mandibles, they can only swallow liquids. When they encounter liquid food in the field, they swallow it and carry it back to the nest. Solid food is cut to reasonable size and carried back to the nest. They prefer protein foods, e.g., insects and meats, but will feed virtually on everything, including fruit, seeds, grease, butter, honeydew, plants, nuts, garbage, i.v. tubes, needles, body oils, etc. They love to eat tuna fish, grape jelly and Coca-Cola, so add 5% or less of boric acid or food-grade DE or borax to these baits. **Keep baits out of the reach of children, pets and wildlife.**

Like other ants, fire ant workers share their food with their nest mates by regurgitating it so that it can be licked or sucked up as a liquid by other ants. In this way, most ants in the nest get fed equally. This food sharing is also why slow-acting poison baits can be an effective control tactic against fire ants. You can try using 1% or less borax or boric acid with 10% sucrose in water by ant colonies for 3 - 4 months - it may take that long to get control. Try using several (filled and drilled) 35 mm film capsules per nest or sponge pieces soaked with bait.

Fire Ant Stings - At least 5 million Americans are stung every year! The CPCO ADVANTAGE - January 1999 noted: A survey conducted in just South Carolina revealed that in the single year 1990, physicians reported treating 5000 cases of imported fire ant stings on humans. This represented a 14-fold morbidity. In all, there were 27 hospitalizations, one death and 170 cases requiring imported fire ant desensitization by an allergy specialist. An updated imported fire ant sting survey is about to get underway. - *Agromedicine Program Update; September 16, 1998*

The fire ants are small (less than a quarter of an inch long), reddish-brown to black and live in mounds with long, radiating underground tunnels. Children can mistake the fire ant mounds for sand piles and be attacked. Older people may also be attacked.

The fire ant's attack is a two-part process consisting of a bite and a sting. When one ant stings, they all sting and inject a venom that causes the release of histamine, a chemical in our bodies that can produce pain, itching, swelling and redness of the skin. Within seconds after the stings, discomfort occurs at each site and a small red welt appears. Each welt can enlarge rapidly, depending on the amount of venom that was injected and the victim's sensitivity to the venom. The reaction persists for up to an hour, and then a small, clear blister will form. Over the next half day or so, the fluid in the blister may turn cloudy, and the area will begin to itch. Most people experience only a small amount of redness around the sting site. A small percentage of people are sensitive to the venom and experience more extensive redness and swelling. A few victims have extensive allergic reactions such as breathing difficulties or widespread swelling of body parts or worse.

The fire ant's venom is an oily alkaloid mixed with a little protein, and your one chance to lessen the effect of the bite is to quickly break down the protein. Try dabbing the bite with diluted bleach or Kleen 'Em Away Naturally® or Safe Solutions, Inc. Enzyme Cleaners, or covering it with a paste of meat tenderizer and water. This method is not effective if more than 15 minutes have passed. Another option is to treat stings with an insect bite remedy

containing benzocaine or other ingredients that deaden pain and protect against infection.

In infested areas, fire ant stings occur more frequently than bee, wasp, hornet, and yellowjacket stings. Stepping on a fire ant mound is almost unavoidable, especially when walking in heavily infested areas. Furthermore, many mounds are not easily seen, with many lateral tunnels extending several feet away from the mound just beneath the soil surface. Ants defend these tunnels as part of their mound. More than 25,000 people each year seek medical attention for painful fire ant bites. The sting itself is usually not life-threatening, but secondary infections can result. To prevent infections do not scratch pustules and treat the sting with an insect bite remedy. Persons who are hypersensitive to the fire ant venom may experience symptoms such as nausea and dizziness or even shock or death. **Individuals exhibiting such reactions to fire ant stings should see a physician immediately. About 1 dozen Americans die of their wounds each year!**

A person who stops to stand on a mound or one of its tunnels, or who leans against a fence post included in the defended area, can have hundreds of ants rush out to attack. Typically, the ants can be swarming on a person for 10 or more seconds before they grab the skin with their mandibles, double over their abdomens, and inject their stingers. **That is why some people die! This does not happen in their native land where the fire ants fear phorid fly species who only live to torture and kill fire ants.** Phorid flies are being currently evaluated in Gainesville, Florida.

Although a single fire ant sting normally hurts less than a bee or wasp sting, the effect of multiple stings is impressive. Multiple stings are common, not only because hundreds of ants may have attacked, but because individual ants can administer several stings. Each sting usually results in the formation of a white pustule within 6 to 24 hours. The majority of stings are uncomplicated, but secondary infections may occur if the pustule is broken, and scars may last for several months. Severe infections requiring skin grafting or amputation have been known to occur from fire ant stings. DMSO has been used to stop pustules and itching.

Some people experience a generalized allergic reaction to a fire ant sting. The reaction can include sweating, slurred speech, chest pain, shortness of breath, hives, swelling, nausea, vomiting, and/or shock. People exhibiting these symptoms after being stung by fire ants should get medical attention immediately. Death can occur in hypersensitive or older or very young people. Individuals who are allergic to fire ant toxins may require desensitization therapy. The March 2002 issue of Pest Control Magazine noted that in 1998 an estimated 660,000 people were stung in South Carolina alone and approximately 33,000 sought medical treatment costing an estimated $2.4 million. **First Aid: Try applying a mix of 4 oz. per quart of Kleen 'Em Away Naturally® or 1 oz. of Safe Solutions, Inc. enzyme cleaners per quart of water or a 1 to 1 mix of bleach and water to the stung area. Try to avoid stings by lightly dusting your shoes, socks, feet and legs with talcum powder.**

Fear of Fire Ants

An important indirect effect of the presence of fire ants is just the fear of being stung. Fear and anxiety about fire ants may limit the use of sites where fire ants are present. In some parks, playgrounds, athletic fields, and campsites are not used simply because of fear of the fire ants in the area.

MONITORING AND THRESHOLDS FOR FIRE ANTS

Monitoring

The first step is to correctly identify the species of fire ants in the area. Population monitoring for fire ant control generally consists of determining the number of active mounds in a particular unit area. Any fire ant mound where at least three ants are observed after mound disturbance should be considered active. Heavily infested fields can contain over 100 active fire ant mounds per acre.

Another method of estimating fire ant populations for comparison studies is by collecting fire ants attracted at baits in a test area. A small piece of hamburger and a small piece of agar containing 40% honey are each placed on a small piece of aluminum foil or in a small plastic cup. The two baits are placed on the ground at each bait station, l'-3' apart, at each bait station. Bait stations are placed about 10 yards apart. The number of fire ant workers attracted to the baits per unit is monitored. Remember this mix if you decide to use baits to kill - mix in 5% or less boric acid or 3% or less sodium borate - **keep out of reach of people and animals.**

Fire Ant Threshold/Action Population Levels

The National Park Service has noted that threshold population levels for fire ants will vary according to the species and the sites. In certain camping and recreational areas, for example, very few active fire ant mounds per acre would likely be tolerated, particularly of the imported species. In contrast, a few active mounds per acre probably would be acceptable in other types of sites; little-used hiking areas, for example. Every effort should be made to correlate fire ant populations observed through the use of monitoring techniques with complaints received. In this way, a complaint threshold level can be established for each area.

In areas where fire ants are not causing any problems, the best solution is to do nothing. Some sites will only support a limited number of fire ants. These may be in the form of a few large colonies or many small ones. Established mounds defend territories, preventing the establishment of new colonies. Maintaining several large, and perhaps well-marked, colonies may be a sound way to stabilize fire ant populations in an area, as long as there is a low risk of people or pets stumbling into the nests.

Some researchers believe it may be best to selectively control fire ant colonies - allowing native species to flourish as a way to prevent the introduction of the imported species, or leaving single queen imports alone to prevent the area from invasion by a multiple-queen "supercolony."

Mounds built by fire ants in fields often interfere with mowing and farming operations. Not only is equipment damaged by dried and hardened fire ant mounds, but operators may refuse to enter fields infested by ants. The number of mounds per acre that can be tolerated as regards equipment damage must be determined on a case-by-case basis.

INTELLIGENT PEST MANAGEMENT® - ALTERNATIVE CONTROLS OF FIRE ANTS

Fire ants, particularly Red and Black Imported Fire Ants, pose a serious dilemma. On the one hand, there can be no doubt that the fire ant is a major pest, stinging people, pets and livestock, disfiguring the landscape, even attacking native animals. In one private preserve, imported fire ants were killing hatchlings of the brown pelican, a threatened species. On the other hand, aggressive insecticide (poison) treatment of critical habitat can have a greater negative impact on a sensitive environment, and volatile, synthetic insecticide poisons have never proven to really control fire ants anywhere - there generally are more fire ants after an "aggressive" poison campaign than before. **So why use these volatile and useless poisons?**

Fire ant management consists of a series of questions and decisions: What fire ant species are in the area? How extensive is the infestation? What can be done to control these pests in neighboring areas? How high is the risk that people, pets or animals will be stung? How much damage are the fire ants doing? Is control action justified? What are the best strategies of control? Answering these questions requires proper inspection and monitoring to determine the nature and extent of the problem. **You must destroy the queen(s)!**

Water Controls - Carefully make a hole in the mound first.

Boiling water has been added to individual fire ant mounds with varying degrees of success reported. Approximately 3 gallons of hot water poured into each mound will eliminate about 60% of the mounds treated. Surviving mounds will need to be treated again. Water has also been applied as steam, using a steam generator, e.g., Vapor Dragon®, usually on a cool day. Both techniques are cumbersome in the field, especially where large numbers of mounds are involved. You can cover the top of the nest with salt and then soak the nest with a sprinkler. We suggest **slowly** flooding with 3 gallons of diluted Kleen 'Em Away Naturally® or Safe Solutions, Inc. Enzyme Cleaners (8 oz.) with or without adding 4 -5 tablespoons of Safe Solutions, Inc. food-grade DE, some citrus oils and/or peppermint soap (3 oz.), or try using one gallon of orange/grapefruit juice, 2 gallons of water and a dash of dish soap or peppermint soap or 3 gallons of hot water and ½ cup lye soap on a sunny but cool day - your success rate will greatly improve. **Area-wide flooding or prescribed burning of fire ant infested areas has proved ineffective, and may actually promote the establishment of new colonies.**

Mechanical Disturbance

Fire ant mounds can be dug up and moved or destroyed, but not without some risk that the fire ants will successfully catch and attack the digger. Talcum powder dusted on shovels and equipment will help prevent fire ant contact. Dragging, shallow discing, driving over or repeatedly knocking down fire ant mounds may provide a limited level of control, but only if mounds are dragged or disced, or driven over just before the first hard freeze. Even tall, hardened mounds can be destroyed by pulling a steel I-beam drag, weighing about a ton, behind a tractor across the fire ant-infested area. Mechanically distrubing or even destroying fire ant mounds during the warm season will usually not reduce the number of active mounds; ants quickly and simply rebuild them. Fields that are annually tilled have fewer fire ant mounds than non-tilled fields because of the continuous mechanical disturbance from conventional tillage practices.

A number of mechanical mound pulverizers, ant electrocuters, even nest exploders, have been developed for fire ant control, but so far the effectiveness and practicality of these alternative devices has not been proven.

Electrical Attractants

Electrical fields and/or impulses seem to attract fire ants; use this attraction to lure fire ants to your borax or boric acid baits or Safe Solutions, Inc. food-grade DE or traps. Solar powered yard lights can be adapted to provide electrical current for a field attractant.

Prevention and Sanitation and Habitat Reduction

Remove mulch, food sources, garbage, manure, fruits and nuts, debris, pieces of lumber, old equipment, weeds and grass; elevate bee hives; caulk and seal or fill with aerosol foam insulation all open voids, cracks, crevices; quickly remove dead animals and hay bales; regularly mow and trim and lightly dust with talcum powder or Comet® or food-grade DE; smear petroleum jelly or Tanglefoot® where you want to keep them out.

Some Biological Controls

A number of biological enemies (pathogens, predators and parasites) of the fire ants have been evaluated as biocontrol agents, including nematodes, bacteria, fungi, viruses, and microsporidia., but biological control has not yet a proven effective control tactic for fire ants. Some show promise, for example, the workerless parasite ant, *Solenopsis daguerrrei* (Santchi) formerly *Labauchena daguerrei* was first discovered infecting 1% - 4% of the colonies of the imported fire ant, *Solenopsis richteri* (Forel) (formerly *Solenopsis saevissima* variety *richteri*) in Argentina. This permanent parasite kills the host colony by decapitating the queens. While scarce in South American they *(S. daquerrei)* might be able to propagate better here as a biological control agent. Phorid flies: There are about 15 species in Brazil and Argentina that attack fire ants there. These *(Pseudacteon spp.)* Parasitiod flies (Dipteria: Phoridae) all parasitize the red imported fire ant *Solenopsis invicta* (Buren). There are at least four (4) species *P.litoralis, P.wasmanni, P.tricucpic* and *P.curvatus* that have been described. *P.curvatus* has also been found ovipositing on the native North American fire ant, *Solenopsis geminata* (F). Sanford Porter, et al, 1997 noted that *Pseudaeteon tricuspic* (Borgmeier) has been developed successfully on *Solenopsis invicta* and a hybrid *Solenopsis richteri xs invicta* from Mississippi. This fly and its cogener, *Pseudacteon litoralis* (Borgmeier) have the peculiar habit of decapitating their living host and using the ant's empty head capsule as a pupal case. The fly takes 4 - 6 weeks to develop from egg to adult. They live only to attack and kill fire ants.

Thelohania. Thelohania solenopsae is a microscopic protozoan (or pathogenic microsporidium) that infects immature and adult fire ants. Diseased ants, including the queens, have shorter life spans and can lay less eggs, so over a period of several months to a year, the colony declines. The pathogen is apparently transmitted by diseased ants moving between multiple-queen colonies. *Thelohania* attacks only the exotic (or red) and the black imported fire ant and does not attack other ant species native to the U. S.

In Argentina, about 20 percent of the red imported fire ant colonies are infected. Surveys in the U. S. did not detect this disease organism until 1997, when it was discovered in Florida. Since then, *Thelohania* has also been found in Texas and Mississippi. Research is under way to discover ways to increase the impact of this pathogen and culture it in the laboratory. (Knutson & Drees)

Beauveria. *Beauveria bassiana* is a common fungus that attacks many species of insects. A strain of *Beauveria* that attacks the imported fire ant was reported from Brazil in 1987. This fungus produces microscopic spores that attach to the ant's body, germinate, and grow inside the ant. The fungus feeds on the internal organs of the ant. The ant soon dies, and its body is filled with a fungal growth. The fungus sometimes grows outside the dead ant, covering it with a white, fuzzy growth. Studies have shown that *Beauveria* applied to the soil is much less effective than if the spores are applied directly to the ants. The application of *Beauveria* to fire ant baits is being investigated. (Knutson & Drees)

Strepsiptera. Strepsiptera are minute insects that parasitize other insects. One species, *Caenocholax fenyesi,* attacks the red imported fire ant in the U.S. Like other Strepsiptera, *C fenyesi* has a complex and unusual life cycle. The female parasitizes a species of bush cricket, *Hapithus agitator.* Once the immature parasite has consumed the cricket, she develops into the adult stage. However, the adult female never leaves the dead cricket. Rather, she produces thousands of eggs that hatch into larvae called triungulins. The tiny, flattened triungulins leave the female and search for new hosts. While female triungulins must find another bush cricket, male triungulins develop in fire ant adults. Once a male triungulin attaches to a passing fire ant, it burrows into the ant to feed and develop. Parasitized fire ants typically climb to a high perch where they soon die. The adult male Strepsiptera then emerges from the dead fire ant. Only about 1 percent to 2 percent of the fire ants in a colony are parasitized by *C fenyesi* in Texas. However, Strepsiptera may have potential benefits if inexpensive mass rearing techniques can be developed that provide high numbers for periodic applications. (Knutson & Drees)

Orasema. Species of *Orasema* (Eucharididae) are tiny wasps that parasitize immature fire ants. Female *Orasema* wasps lay large numbers of eggs on plant leaves and buds. The eggs hatch into tiny flattened larvae called planidia. The planidia lie in wait and attach to passing ants. Once in the ant colony the planidia leave the worker ant and attach to ant larvae. When the ant larva pupates, the planidia consumes the ant pupa. Typically, only a small percent of the fire ants are killed by *Orasema.* Several species of *Orasema* parasitize the imported fire ant in South America, and several other species of *Orasema* occur in the U.S. Research is under way to learn more about these ant parasites and to develop mass-rearing techniques.

Nematodes and mites. Certain nematodes *(Steinernema spp. and Heterorhabditis* species and parasitic mites *Pyemotes tritici*) also attack and parasitize red imported fire ants, and other insects. Ants in treated colonies often leave the nesting site or mound and move to a new location. However, field evaluations of commercially available species/strains of these parasites currently being marketed for fire ant control have not yet been conducted to demonstrate their effectiveness. (Knutson & Drees)

So far, one of the most effective of these biological controls is a nematode, *Neoaplectana carpocapsae.* In trials, one application has inactivated about 80% of treated mounds in 90 days. The straw itch mite, *Pyemotes tritici,* has also been shown to inactivate fire ant mounds. Three to ten applications at about two week intervals gave 70% control. Practical use of this mite for fire ant control must await the development of more efficient methods of mass production and increased effectiveness. Another problem is that this mite is a pest of people and animals; it bites and a causes dermatitis. It is thought the phorid flies only parasitize 1% - 3% of the fire ant colony, but the ant behavior is far more important, the fire ant workers quickly learn to escape underground or assume a defensive poisition and only 3 - 4 flies are needed to disrupt normal ant activity.

Ant-Proofing

Fire ants, like other ants, may be nesting near buildings and can enter and move through a structure through innumerable tiny cracks and openings. Caulking and foaming with aerosol insulation or otherwise sealing cracks and crevices and areas being used by fire ants can often have great effect in suppressing the population inside. **If it is not safe or possible to caulk and/or to foam, dust with talcum or medicated body powder or food-grade DE.** Many effective, easy-to-use silicon sealers or caulks and expandable aerosol foam insulation products have been recently developed, including some designed specifically for pest management.

Public Education

The most effective measure for preventing fire ant injury to people is education. Activities should be directed away from highly infested fire ant areas. People should be informed about the habits of fire ants, how to recognize them, and how to avoid them. People should be encouraged to use proper sanitation so that fire ants are

not attracted to such sites as picnic areas. And if the worst happens, information should be available on what to do if a person is stung.

Intelligent Pest Management® Alternative Mound Treatments

Treating individual fire ant mounds is time consuming, but it is generally the most effective method of control. It takes from a few hours to a few weeks to "kill" the mound, depending on the product used. Individual mound treatment is usually most effective in the spring. The key is to locate and treat all the mounds in the area to be protected, not always a simple task. If many young mounds are missed, reinfestation of the area can take place in less than a year. The following discussions describe different ways to treat individual mounds.

Fire Ant Mound Drench. Take 3 gallons of water and add 8 oz. of Kleen 'Em Away Naturally® or 2 oz. - 3 oz. of Safe Solutions, Inc. Enzyme Cleaner with Peppermint and gently flood the mound and surrounding area with the diluted enzyme cleaners (or a 3-gallon mix of 1/3 orange juice and 2/3's water and a dash of dish soap). Break open the top of the fire ant mound and pour 3 gallons of the diluted enzyme/orange juice dilution directly into the galleries. It has been observed that when a man urinates on the mounds, the ants die, so try urine or a mix of turpentine or pine oil and ammonia in water. Other drenches include diluted peppermint soap at a rate of 1 pint per 3 gallons of water. **Open the top of the mound; then wet the top of the mound, then soak an area around the base of the mound and pour the remaining drench on the top of the mound from a height of at least 3 feet to help penetrate the entire mound.** Mound drenches are most effective after rains when the ground is wet and the ants have moved up into the drier soil in the mound. During excessively dry weather, effectiveness of the treatment may be enhanced if you soak the soil around the mound with plain water or diluted enzyme cleaners before you flood the mound with diluted 3 gallons of diluted enzyme cleaner or orange juice, or steam. A simple way to flood a lot of mounds in your yard is to use a hose end sprayer and fill the container with Kleen 'Em Away Naturally® or Safe Solutions, Inc. Enzyme Cleaner with Peppermint and then simply soak the mound and surrounding area.

Coke. Take two (2) 2-liter bottles of Coca-Cola and pour directly into (a hole) in each mound.

Carbon Dioxide (CO_2). Insert several pounds of dry ice or inject the dense gas which is one and a half times heavier than air (use a 20# cylinder of CO_2 with 12 feet of hose and a 3' - 4' pipe attached) into the fire ant mound and it moves downward killing all worker ants, larvae and the queen. There is no odor or warning as the CO_2 gas silently replaces the air in the entire chamber and any connecting tunnels or chambers or mounds. CO_2 is not harmful to plants or lawns and after killing the fire ants in the mound, CO_2 returns back into the air. **Fire ants do not like frozen ground.**

Carbon Monoxide (CO) created by burning (6 - 8) charcoal briquettes will also control fire ants if you throw them into a hole in the mound with a 2'+ wall (e.g., half of a barrel, open on both ends) around the mound/hole. Propane and other heavier than air gases will also work, but are certainly not as safe.

War! Take 2 shovels, dust the handles, your shoes, socks and trouser bottoms with talcum powder; get a shovel full of each mound; then transfer each shoveful to the other mound and let the ants fight it out among themselves.

ADDITIONAL FIRE ANT CONTROL THOUGHTS: Fire ants will usually not build a mound in a shady location. Mounds on clay soils are usually higher than those on sandy soils. There can be 50 - 800 mounds per acre with a combined biomass equal to that of a cow! They move quickly and can relocate their entire colony in less than 24 hours. 75% of fire ant colonies move at least once every 90 days, usually when they are disturbed by vibrations, lawn mowers, traffic, insecticide poisons or repeated flooding either natural or man-made. There are several biological controls for fire ants, e.g., parasitic pyemote mites and parasitic nematodes, e.g., Nc Nematodes. There are at least 18 species of parasitic phorid flies, 3 species of nematodes, 10 or more microorganisms, a parasitic ant, a parasitic wasp and dozens of other symbionts of undetermined importance and/or effectiveness in South America but only 2 - 3 in the U. S. (Collins 1971). That is, obviously, why the fire ants are 4 - 7 times more abundant here than in South America, When fish eat fire ants, they often die. Whole fire ant colony "balls" can float in clear water, but sink in soapy or enzyme water and will not cross a sticky barrier. As a last resort use natural diatomaceous earth with pyrethrin, e.g., Perma-Guard® or call 1-800-322-5252 and order Insecto Formula 7 which uses all natural

ingredients, e.g., sugar, ammonia and pine oil and is mixed 1 oz. to a gallon and then poured directly on the nest. Try boiling your own "brew" of soapy water (3 - 4 oz. liquid dish soap or Kleen 'Em Away Naturally® or 1 oz. of Safe Solutions, Inc. Enzyme Cleaner with Peppermint per gallon for a total of 3 - 4 gallons) with or without vitamin C, ascorbic and citric acid, orange juice, pine oil, diluted enzyme cleaner, citrus oils, sugar, white vinegar and/or ammonia and pour the mixture on each nest in the yard; repeat daily as needed. The oils in citrus peels are very effective on ants that contact them - but they break down quickly, so copiously flood the nests with them. Spray geraniol diluted in olive oil as a repellant.

Baits. You can broadcast freshly processed corn cob grits coated with soybean oil with 1% borax as a homemade bait in the spring and the fall, especially when no mounds are visible. If you bait in summer, bait in the late afternoon or at night. Use about 1 - 2 oz. per 1,000 square feet. The ants will find the grits and extract the toxic oil for food. Prebait with potato chips to see where to place the baits. If you have a mound, bait around the mound up to 3 feet away (or in a bait container) rather than broadcast the baits. **Do not put bait on top of the mound, unless you open it up first and wait 8 minutes.** 10% sugar and 1% boric acid or borax liquid baits may eventually work but the control may take 3 - 4 months to obtain control. You can try sprinkling 1/2 cup of dry instant grits or Malt-o-Meal® on each dry mound. Try using a sweet bait (10%) with soybean oil (87%) and enzyme cleaner (3%) soaked into corn cob grits or pieces of sponge. Try sliced raw fish soaked in a 5% - 10% boric acid acid bath for 10 minutes. You can use freshly ground crickets with 3% - 5% boric acid. **Do not apply baits if the ants are not actively foraging.**

Dusts. If you are digging up a mound, dust the bucket and/or shovel with baby powder containing talc to keep fire ants from climbing up. You can also dust the nest and surrounding area with food-grade DE, Comet® cleanser or medicated body powder to control or repel fire ants or keep them for entering an area or electrical device or building or bee hive, etc. In a pinch, simply cover the mound with fire wood ash.

Fire Ant Control Summary: Fire ants can be quickly controlled when sprayed or flooded and drenched with Kleen 'Em Away Naturally® or Safe Solutions, Inc. Enzyme Cleaner with Peppermint. Applications of copious amounts of diluted enzyme cleaners or carbon dioxide are most effective when the nest is drenched mid-morning on sunny days after cool nights in the early spring or late fall. Poke a stick into the nest and make several holes to accept the mixture; then flood the entire area, or bait with enzyme cleaners. Call Safe Solutions, Inc. at 1-616-677-2850. Whitmire Research Laboratories recently introduced PT 370 Ascend Fire Ant Bait® which contains 0.011% avermectin B_1 in a highly attractive corn grit base saturated with protein oil. Avermectin is naturally derived from the soil fungus *Streptomyces avermiltilis*. Ascend works both as an acute toxicant and as an insect growth regulator to quickly and effectively control fire ants. Foraging fire ants carry Ascend's dual action insecticide back to the mound. Ascend's stomach insecticide works slowly but surely to reduce the colony's population; be sure to allow enough time for its unique sterilizing property to be passed on to the queen. This causes the worker brood to eventually disappear, and the colony is ultimately destroyed. Note: Parasitic Brazilian, *Pseudacteon* 18 spp*,* flies are parasitic only on fire ants. The female fly deposits an egg on or in a fire ant's body. The maggot moves through the neck into the head and eats the contents; **then an enzyme dissolves the connecting tissue and the head falls off.** That is just another reason why enzyme cleaners kill any ant species very quickly. At least 18 species of Phorid flies are known to be parasitic on a number of ant species, including imported fire ants. The parasitic nematode *(Neoplectana carpocapsae)*, when combined with a bait may give results if undetected as will the fire mite when introduced into the colony. There is anaother nematode that also can be used - *Steinernema carpocapsae*. There also is a protozoan disease called *Theohania solenopsae* and a workerless social parasite called *Solenopsis dagerrei*. Large colonies of Argentine ants will keep fire ants at bay - These two species can not and will not co-habit or co-exist in the same area. Talcum powder and/or medicated body powder or food-grade DE or napthalene will also control/repel fire ants. Also, don't forget to caulk, fill or seal off any openings into your building. You can also use WD40 or vacuum up fire ants where it is not safe to use water sprays or foam or steam or carbon dioxide. Once a natural enemy or pathogen is introduced to a small area, it spreads quickly on its own - thus no *professional* from the poison *industry* wants to develop these extremely safe and effective pest controls - because there is no profit incentive. **Reinfestation can be expected every 6 months if you use "registered" poisons.** According to an advertisement in the February 2001 issue of Pest Control: "Purchases of fire ant 'control' products are in excess of $100 million annually and growing."

California's Fire Ant (Pesticide Poison) Battle Plan - Leslie Berkman from The Press Enterprise Company published 3/20/99 quoted the California State Department of Food and Agriculture who acknowledged that "the

possibility of eradication is low and will be difficult to achieve." That conclusion, the State said, is based on "the widespread nature of the infestation, the biology of (the ant) and the fact that the ant) has never been eradicated since being introduced in the United States." Conspicuously absent from the State plan was a price tag. (The State's "battle plan" will spray "registered" poisons via helicopter even though this has never been done successfully anywhere. California State Republican Assemblyman, Bill Campbell, said, "I'd be willing to stand out in the field when that helicopter is going overhead." Amazing!