Managing Red Imported Fire Ants in Electrical Equipment and Utility Housings

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Like many other ants, the red imported fire ant, *Solenopsis invicta* Buren (Hymenoptera: Formicidae), frequently infests electrical equipment and utility housings. Two types of problems are caused by ants to electrical equipment exist:

- Movement of entire colonies into electrical housings
- Affinity of foraging worker ants to electrical fields and switching mechanisms.

Movement of entire colonies into electrical boxes. Fire ants can be found in electrical housings during all times of the year. Air conditioners, traffic signal boxes, and other devices can be damaged. Ants nesting in these units are highly defensive of their colony and can be a medical threat to maintenance personnel.

Electrical housings (e.g., outside electrical disconnects, junction boxes, pad mounted transformers, etc.) provide warmth during winter months, a dry nesting site during heavy rains, and an undisturbed nesting site throughout the year. When a colony moves into an electrical box, worker ants import soil for nesting. This material can cause corrosion and interfere with maintenance operations.

In electrical transformer boxes, oil regulates the temperature in half of the box. When moisture from the mound causes corrosion, the oil leaks, inhibiting temperature regulation and resulting in failure of the transformer. In addition to corrosion, once inside, the ants chew on insulation and can cause short circuits or interfere with switching mechanisms.

Affinity of foraging worker ants to electrical fields and switching mechanisms. Imported fire ant colonies (mounds) are often found at the base (slab) or near housings of electrical units. Worker ants leave these nests in search of food to bring back to the rest of the colony members (larvae, other workers, and indirectly to the queen and reproductive ants). However, when worker ants enter switching mechanisms of electrical equipment, the ants can become a problem.

Worker ants of many ant species have an affinity for oscillating magnetic fields (60 cycles per second), including carpenter ants (*Camponotus* sp.), acrobat ants (*Crematagaster* sp.) and crazy ants (*Paratrechina* sp.) (see B-6183). Once ants in a switching mechanism bridge the gap between an open switch, they are shocked and electrocuted. The shocked ants release communication chemicals (pheromones) or other signals that attract other worker ants. The result is that switching unit can become tightly packed with the bodies of dead worker ants, causing a failure of the mechanism.

Management Options

Fire ant colonies nesting *around* and at the base of electrical units can be managed to prevent them from entering these structures using methods available and insecticides registered for sites in which these units are located. For example, if fixtures are located indoors or in food production areas (agricultural lands), use fire ant insecticides registered for these specific sites (see publications B-6043, SP-196 and B-6183). For colonies located *inside* electrical installations or electrical boxes, specialty products are available with instructions for their application in these locations (see below). *Closely follow the instructions provided on the product label*.

For safety reasons, it is recommended that *an electrician or a licensed pest control operator treat infested electrical equipment*. Before treating any equipment, unplug the unit or turn off all electrical service. Specialized control products and training may

be necessary to treat these sites effectively and safely.

- **Step 1.** Eliminate colonies in and around electrical and plumbing casings and housings. Around water meter casings, immediate control can be obtained with injectable aerosol products containing pyrethrins or similar products. Read the label carefully if applying pesticide around water systems and well heads Mounds around structures or areas around electrical structures can be treated using one of the programs described for use in "Home Lawn and Ornamental Turf Areas" section in B-6043. Be careful and *turn off all electrical service* before starting. For fast control using a bait-formulated product, such as hydramethylnon bait (Amdro®, Amdro® Pro, Probait®), or indoxacard (Over n Out®, Advion®) or spinosad bait product (Green Light® Fire Ant Control with Conserve® or others), applied to individual fire ant mounds will provide control in about one week. Do not use liquid drenches or sprays that can be hazardous around electrical fixtures or products that may damage insulation.. Once the ant problem is eliminated, debris and soil should be removed to reduce the possibility of short circuits.
- **Step 2.** If necessary, treat equipment housings to eliminate ants with products labeled for such use, including, Stutton® JS 685 Powder (synergized pyrethrins plus silica gel).

Maintenance program options. After ants are removed from the electrical equipment, several things can be done to prevent re-infestation:

- Where possible, seal all sensitive electrical components, particularly locations that are not insulated, such as plastic housings containing contact points of switches, relays, and circuit breakers.
- Apply insecticide barriers in housings around structures such as cable bundles leading to sensitive components using long-residual contact insecticides such as Arinix™ products (permethrin) or Rainbow Fire Ant Killer (chlorpyrifos). Vapor-active insecticide insecticide products such as Elastrel™ Insecticide (dichlorvos), High Tech Insectape® Insecticidal Strips (propoxur) are sold to prevent ant infestations in enclosures. Talstar® EZ Granular Insecticide (bifenthrin), a contact insecticide, can be used to treat soil around pads.

Treatment program options:

- Apply specifically labeled products to the housing (see Step 2 in the program above).

Alternative Approaches and Possibilities

Suppression of imported fire ants in the community. Reduction or elimination of imported fire ants in the larger landscape will lower the probability that ant problems will occur in electrical equipment and utility housings. Community-wide management programs can reduce ant problems by roughly 90 percent and maintain suppression with routine treatments (see FAPFS 015 and B-6043). Other efforts to improve our ability to manage ants are under investigation, including biological control options, exploitation of genetic and physiological traits, and development of more cost-effective, environmentally-sound, chemically-based methods.

Mechanical exclusion. Ants can enter holes as tiny as the diameter of the wire of a paper clip (0.5 mm). However, materials with no holes (completely sealed) or holes small enough to exclude ant entry can be used to prevent ants from entering into at least the sensitive components of an electrical installation.

Physical barriers. Certain materials (e.g., Teflon®, Fluon®, Tanglefoot®, or similar materials) prevent ants from being able to walk up vertical surfaces, although they lose their effectiveness under certain conditions (e.g., when they get wet, old or dirty). Even certain physical features such as downward angled flanges may disorient foraging workers and prevent them from successfully accessing a sensitive area. Some of these have been used to develop insect or ant-free pet bowls! Ants avoid heated wires or strips that are 140°F or hotter. These concepts/ components could provide an ant-free unit, or at least they can be utilized in such a way as to prevent ants from gaining access to sensitive components.

Landscape media barriers. Certain landscaping media, such as pea gravel and perhaps other types of rock, appear to be unfavorable nesting materials for fire ant colonies and foraging ants (see FAPFS 026). However, why these substrates are unattractive to ants, under what conditions, and how deep or wide these deposits of landscape materials need to be has not been adequately studied. Also, in many cases mounting pads are elevated in the landscape, making them attractive to migrating ant colonies particularly during very wet, saturated soil conditions.

Do Electricians Need to be Licensed by the Structural Pest Control Board?

Persons serving as electricians can apply pesticides in and on the outside of electrical equipment being serviced WITHOUT a commercial or noncommercial pest control-operators license, providing this service is a necessary part of their normal service activity and NOT a service for which separate charges are being made.

If you are receiving payment for any pest control or suppression services, either from paying customers or from your employer, please obtain further information about obtaining and maintaining a Pest Control Operators License by contacting the Structural Pest Control Board at 1019 Brazos Street, Austin, TX 78701; 512/305-8250.

Sources of Specialty Products for Fire Ant Management in Electrical Housings and Equipment

ARINIX™ Products. Permethrin impregnated nylon plastic. (Nix of America, 181 Metro Drive Suite 590, San Jose, CA 95110; 408-971-3115)
ARINIX™ products can be purchased in various forms (flat strips, L-shaped strips, spiral wraps, trackrolls, and grommets) and lengths. Laboratory tests conducted under accelerated aging conditions showed that ARINIX™ is effective for up to five years. This product acts as an insect repellent for red imported fire ants, spiders (except Black Widow and Brown Recluse), and ants (except carpenter and pharaoh ants), and is therefore best used as a prevention.

Elastrel™ Insecticide. Dichlorvos dispenser (Fermenta Utility Protection Div., 10150 N. Executive Hills Boulevard, Kansas City, MO 64190-1350; Local distributor: Southwestern Fumigation Co., P.O. Box 3004, DeSoto, TX; 214/230-4619)
Elastrel™ Insecticide is designed for use in enclosed outdoor utility equipment of communication, electrical, gas service, water service, and cable television companies. Elastrel's patented slow release technology is proven effective against most insects including ants, fire ants, bees, wasps, and cockroaches.

High Tech Insectape® Insecticidal Strips. Propoxur containing Baygon® adhesive backed strips (Rainbow Technology Corp., 261 Cahaba Valley Parkway, Pelham, AL 35124-1146 (800/637-6047)
For protection of security, telecommunications, power and electronic equipment. Kills roaches, ants, spiders, hornets, wasps, bees and yellow jackets after they walk across the strip's surface. Repels and prevents nesting inside of equipment and enclosures.

Stutton® JS-685. Pyrethrins plus silica gel aerosol (Stutton Corporation, 11210 Ladnier Road, P.O. Box 6040, Biloxi, MS 39532 228/396-0396 or 800/357-1323; Contact: Lorie Student, stutcorp@aol.com).
Aerosol treatment kills ants on contact and has 7 month residual control; non-conductive to 15,320 volts. Also labeled for roaches, crickets, fleas and silverfish.

Rainbow Fire Ant Killer. Chlorpyrifos 5%G (Rainbow Technology Corp., 261 Cahaba Valley Parkway, Pelham, AL 35124-1146 (800/637-6047)
Controls ants and fire ants in and around buried cable and cable television pedestals, pad-mounted electric power transformers, and underground vaults. Also controls crickets, earwigs, fleas, millipedes, roaches, scorpions, silverfish, sowbugs, spiders, ticks, and waterbugs. Sold only to utility industry personnel.

Talstar® EZ Granular Insecticide. Bifenthrin 0.2%. (FMC Corporation, 800/321-1362)
Reduces and prevents ant and fire ant mound building activity on electrical pads. Only for sale, use, and storage by commercial applicators.

Acknowledgment
The authors thank Dr. Harlan Thorvilson and Dr. Bobby Green, both from Texas Tech University, for their review of an earlier version of this fact sheet.

For more information regarding fire ant management, see Extension publications B-6043, *Managing Red Imported Fire Ants in Urban Areas*, SP 196, *Management of Imported Fire Ants in Cattle Production Systems*, B-6099, *Broadcast Baits for Fire Ant Control*; or L-5070 *The Texas Two-Step Method Do-It-Yourself Fire Ant Control for Homes and Neighborhoods*. Also visit our web site at http://fireant.tamu.edu.