EVALUATION OF "ORGANIC" AND ALTERNATIVE IMPORTED FIRE ANT MOUND DRENCH TREATMENTS

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Materials and Methods:

This trial was established, April 21, 2003 (10:00 a.m - 5:45 p.m.), at Hornsby Bend, Center for Environmental Research (2210 South FM 973, Austin, TX 78725). Sixteen plots, each containing 10 red imported fire ant mounds but varying in length, were established. Plot lengths were measured and arrayed from shortest to longest and divided into three replicates (blocks) each containing five plots. Treatments were assigned randomly within each replicate so that the total plot lengths for the three replicates was roughly equal.

Treatments:

1. Untreated control (check) - 1 gal water per ant mound
2. Diatect III Insecticide (for industrial/commercial use only) = Results™ Fire Ant Control (Diatect International, 875 South Industrial Parkway, Heber City, Utah 84032, Telephone: 800/227-6616; www.diatect.com) CAUTION. pyrethrins 0.20%, piperonil butoxide (PBO) 1.0%, silicon dioxide 82.0%,: Instructions for use - 4 Tablespoons/gal/mound. Note: 1 lb container treated 26.5 mounds.
3. Diatect V™ Organic Insect Control (Diatect International, 875 South Industrial Parkway, Heber City, Utah 84032, Telephone: 800/227-6616; www.diatect.com) CAUTION. silicon dioxide 82.45%, pyrethrins 0.50%: Instructions for use equivalent to Diatect III Insecticide - 4 Tablespoons/gal/mound.
4. EcoEXEMPT™ IC Insecticide Concentrate (EcoSMART Technologist, Inc. 318 Seaboard Lane, Suite 202, Franklin, Tennessee 37067; Telephone: 888/326-7233; 615/261-7300; FAX: 615/261-7301). CAUTION. Rosemary Oil 10% (Inert Ingredients: Oil of Wintergreen, Mineral Oil): Instructions for use provided by Gary Ross (Prentiss Inc., 817/263-1799) - Mix 2 oz non-ionic surfactant (e.g., Thoroughbred) per quart EcoEXEMPT IC; apply to red imported fire ant mounds as 1 oz/gal/mound drench.
5. Erath Earth Orange Oil (Erath Earth a Gathering and Holding Co., Rt. 2, Box 111, Hico, TX 76457) Directions for use: 1-2 oz per gallon of water for foliar spray; 6 to 8 oz per gallon of water for soil drench. Applied in similar manner as EcoEXEMPT IC - Mix 2 oz non-ionic surfactant (e.g., Thoroughbred) per quart EcoEXEMPT IC; apply to red imported fire ant mounds as 1 oz/gal/mound drench.

The emulsifier used in treatments 4 and 5 was Thoroughbred™ Nonionic Organosilicone Surfactant (Estes Inc., Wichita Falls, TX 76303) - proprietary blend of polyalkyeneoxide modified polydimethylsiloxane and nonionic surfactants 99%).

A sixth treatment was evaluated in this demonstration, but due to a limited availability of product, lack of space and low ant mound numbers, this treatment was not replicated. Only ten mounds were drenched and marked in one plot using Garden-Ville Anti Fuego Soil Conditioner (Garden-Ville, a Division of TLM, L.L.C., 14080 Nacogdoches PMB #314, San Antonio, TX

78247; www.garden-ville.com) contains orange oil, molasses, humate. Directions for mixing use: 4 oz (to 6 oz) of Soil Conditioner per gallon of water to make ready-to-use (RTU) drench solution; thoroughly drench affected and surrounding area with RTU. Reapply drench if necessary. Product information: Garden-Ville Anti Fuego/Soil Conditioner is the original orange-oil based formula designed to drench and condition soils contaminated by mound building insects. University trials conducted in 1999 demonstrated the effectiveness of Anti Fuego/Conditioner treatments. Note: 1 qt treated 10 mounds. (Similar to Garden-Ville Fire Ant Control).

Prior to treatment, each mound marked with a field flag for treatment was examined for ant activity using the minimal disturbance method whereby a mound is considered to contain an active colony if a dozen or more worker ants emerge en masse following mild disturbance. This assessment was made 4, 7, 14 and 30 days following treatment. On the last evaluation date all imported fire ant mounds were counted within each plot to determine if colonies had migrated into or out of plots of may have moved or "shattered" as a result of treatment. Native ant colonies present in plots were also noted. Data were analyzed using using analysis of variance (ANOVA) and separated using Duncan's Multiple Range Test (DMRT) at $P \leq 0.05$ (Microstat, Ecosoft, Inc.).

Results and Discussion

Little rain occurred during the course of this trial (**Table 3**) resulting in a steady decline of ant activity as documented in mounds treated with 1 gallon of water drench only on April 21 (**Table 1**). All treatments significantly reduced active ant mounds in plots relative to the water drench (untreated check) 4, 7 and 30 days following application. At 14 days after treatment, the only treatments which significantly differed from the untreated check plot mound numbers were: 1) Diatect III containing the non-"organic" piperonil butoxide (PBO) synergist; and, 2) Erath Orange Oil emulsified with Thoroughbred™ nonionic surfactant. Of interest is the "performance trend" for EcoExempt treatment (emulsified rosemary oil). After 4 days of application, all ant activity in treated mounds appeared to be eliminated, only to return in almost half (4/10) of the treated mounds 7 and 14 days later. Plots were sampled again, 46 days following treatment, so that one assessment could be made following a significant rain event. Statistically, results were similar for marked and treated mound data on that date (June 9), although mound numbers continued to decline in all plots due to prevalent hot, dry conditions. There were no significant differences between treatments. In contrast to the 30 day assessment of all ant nests in treatment plots (**Table 2**), by day 47 no statistical differences occurred for the total number of mounds per plots (untreated check - 3.67; Diatect III (PBO) - 2.0; Diatect V - 1.6; EcoEXEMPT IC- 3.67; Erath Orange Oil - 3.67) and only 3 native ant nests were detected, all in one Erath Orange Oil treatment plot.

As a "home recipe," emulsified Erath Orange oil appeared to be a very promising treatment in this demonstration. It is certainly simpler to formulate than a "recipe" found on another orange oil product, Green Sense™ 100% Citrus Oil (RO, 1651 Wall Street, Garland, TX 75041; www.greensense.net) 100% D-Limonene (Orange Oil): "As a mound drench, mix one-third GreenSense Citrus Oil, one-third Compost Tea and one-third Blackstrap Molasses. Add one cup

of this mixture to one gallon of water. Shake well. Pour directly on affected area. Product information: GreenSense 100% citrus oil is extracted from citrus rind. Common uses for citrus oil are as a household solvent or cleaner to replace a wide variety of chemicals. In addition to its effectiveness as a cleaner and low toxicity, it smells great! Citrus oil can also be used as an ingredient in formulations for various home, garden and pet applications." Note: these orange oil products are not sold as pesticide products (labels make no specific claims of insecticidal activity) and they are not registered as pesticides by the Environmental Protection Agency.

Further testing under a wider range of soil and soil moisture conditions should further support results documented in this demonstration.

Table 1. Reduction of active red imported fire ant mounds from 10 treated in plots of various lengths (3 replicates) treated April 21, 2003, Hornsby Bend Center for Environmental Research, Austin, Texas (Travis County).

		----------Mean no. active mounds/plot*----------			
Treatment	Plot length	Day4	Day 7	Day 14	Day 30
untreated check	104.0 ft.	8.67a	8.00a	7.33a	6.33a
Diatect III (PBO)	98.3	1.00b	1.33b	1.67b	1.00b
Diatect V	96.0	1.67b	2.33b	4.67ab	2.67b
EcoEXEMPT IC	83.7	0.00b	4.00b	4.00ab	1.33b
Erath Orange Oil	87.7	1.00b	2.00b	2.00b	0.33b
F ratio	0.161	22.485	11.368	4.33	8.487
P	0.952	0.0002	0.0022	0.0372	0.0056
d. f. = 4					
Non-replicated treatment:					
Anti Fuego	269.0 ft.	6/10	2/10	2/10	1/10

* Means in columns followed by the same letter are not significantly different using analysis of variance (ANOVA) and separated using Duncan's Multiple Range Test (DMRT) at $P \leq 0.05$.

Table 2. Active red imported fire ant mounds and native ant colonies 30 days following April 21, 2003 treatment, Hornsby Bend Center for Environmental Research, Austin, Texas (Travis County).

	Total no. ant mounds/plot*	
Treatment	Fire Ants	Native Ants
untreated check	7.00a	0.67ab
Diatect III (PBO)	1.67d	0.33ab
Diatect V	4.67abc	0.00a
EcoEXEMPT IC	7.00ab	0.67ab
Erath Orange Oil	4.00cd	1.67a
F ratio	7.366	2.258
P	0.0086	0.1519
d. f. = 4		
Non-replicated treatment:		
Anti Fuego	4.0	0.0

* Means in columns followed by the same letter are not significantly different using analysis of variance (ANOVA) and separated using Duncan's Multiple Range Test (DMRT) at $P \leq 0.05$.

Table 3. Weather data for April, May and June of 2003 from Austin Weather Data (Austin-Bergstrom).

Month	Mean Temperature(F)	Total Rainfall(inches)
April	68.67	0.06
May	79.03	0.51
June	80.73	4.06

Evaluation of Organic™ Solutions All Crop Multipurpose Commercial and Agricultural Insecticide as a Red Imported Fire Ant Mound Drench Treatment

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The red imported fire ant, *Solenopsis invicta* Buren (Hymenoptera: Formicidae), is a major economic pest in Texas. Surveys conducted by the Department of Agricultural Economics and the Texas Agricultural Statistics Service have estimated the total annual fire ant damages and expenditures for Texas to be 1.2 billion dollars.

Objective: This trial evaluated five currently available mound treatments to control red imported fire ant colonies in a controlled, replicated field test.

Materials and Methods

This trial was established on the Ingram Ranch in northern Comal County approximately 45 miles north of San Antonio, Texas on November 1, 2002. The treatment area was located at the eastern end of an abandoned pecan orchard on the ranch. The orchard was fenced, preventing entry by livestock, but still accessible to whitetail deer and wild turkeys native to the ranch. Five currently available products used to control red imported fire ant colonies evaluated and compared are as follows:

1. Organic™ Solutions All Crop Multipurpose Commercial and Agricultural Insecticide (0.2% pyrethrins, 1.0% piperonyl butoxide or PBO and 82.9% silica dioxide) - 4 Tbsp (scoops)/gal water.
2. Bayer® Advanced Lawn® Fire Ant Killer (1.0% cyfluthrin) - 1 tsp or 2 tsp for mounds exceeding 12 inches diameter (only one in this trial), followed by drenching mound with 1 gal water. Note: 10 oz container treated about 65 mounds.
3. Ortho® Fire Ant Killer Granules II (0.2% bifenthrin) - 1 cup/mound, followed by drenching mound with 1 gal water. Note: 3.5 lb bag treated 9 mounds. "Prevents new mounds from forming for up to 4 months."
4. Terro® Fire Ant Killer (0.05% deltamethrin) - 1 Tbsp/mound applied as dry dust. Note: 24 oz. container treated 45 mounds.
5. Surrender® Brand Fire Ant Killer (75% acephate) - 2 tsp/mound applied as dry dust. Note: 16 oz container treated about 108 mounds.
6. Untreated control (wet) using 1 gal water drench per mound

7. Untreated control (dry) left dry.

In addition to the above treatments, soil samples were collected at pre-determined intervals from the Bayer®, Ortho® and Organic™ Solutions groups to determine pesticide residue levels over the period of the trial (see methods described below) - 30 days.

Twenty-eight plots of similar width, but varying in length, each containing ten imported fire ant mounds, were established on November 1, 2002. Plot numbers were arrayed from longest to shortest and divided into four blocks or replicates of seven plots each, with one replicate containing the longest plots, one containing the shortest plots and the remaining, intermediate blocks. Plot corners were marked with colored flags and mounds in that plot were marked with the corresponding color of flag. This method assured that re-invasion of ant colonies migrating from outside plots would be similar for all treatments. Treatments four and five were applied dry without a water drench and the remaining treatments were applied dry followed by an application of one gallon of clean water poured through a colander to simulate a sprinkling can.

At 2, 7, 14 and 30 days after treatment, ant mounds were disturbed slightly and evaluated for ant activity, if any. If a dozen or more worker ants emerged from the slightly disturbed mounds within 30 seconds, the colony was determined to be active. On days 7 and 30 following treatment, the number of "new" colonies appearing within the treatment plots was assessed to determine whether treated ant colonies had moved to new locations or split into more than one colony.

To collect soil samples for pesticide residue analysis, three plots of 20 mounds each were laid out separately from the treatment area and treated in the same manner with either the Bayer®, Ortho® or Organic™ Solutions product on the same day as the rest of the trial. An untreated plot of 20 mounds was also laid out. Prior to treatment and within 1 hour after treatment, soil samples of approximately 10 oz. (285 g.) were collected from each of the four plots described above, placed into a labeled soil sample bag and then placed into a cooler full of ice. In addition, samples were then collected from different mounds within the same plot in a similar manner on day 7, 14 and 30 after treatment. Soil samples were collected at an average depth of four to six inches (10 to 15 cm) from within the sampled mounds. Soil samples were stored in a darkened freezer at 0ºF (-17.8ºC) until the end of the trial. At the end of the trial, all soil samples were hand-delivered in an ice chest to Environmental Laboratory Services in Austin, Texas, for analysis. During the trial, the median daily temperature was 55ºF (12.8ºC), the site received 1.2 inches (3.0 cm.) of rain and the soil type at the site was a heavy clay loam vegetated with native bunch grasses and bermuda grasses.

Results

All treatments significantly reduced ant activity in treated mounds relative to mounds in the untreated check plots (**Table 1.**). At the 2 day mark after treatment, insecticides applied with a water drench were significantly more effective than those applied dry, but all treatments were equally effective by day 14 after treatment. It should be noted that all treatments applied dry did not result in complete elimination of active mounds at any time during the trial (maximum of 97% reduction), while all treatments applied with a water drench had 100% reduction in activity of treated mounds at the end of the trial. Water applications to the untreated mounds did not result in statistically significant differences in the number of active mounds compared to untreated fire ant mounds left dry, but the disturbance of the untreated mounds due to adding the water drench did result in slightly lower means than those untreated mounds left dry. On the Day

14 and Day 30 evaluations of "new" mound formation in all plots, new mounds were noted in the vicinity of inactive, untreated mounds, especially those that had been "watered."

Analysis of soil samples (**Table 2.**) revealed that cyfluthrin levels remained highest at the end of the trial while bifenthrin levels were lowest. Pyrethrin levels on average were lowest throughout the trial.

Discussion

Organic™ Solutions All Crop Multipurpose Commercial and Agricultural Insecticide (0.2% pyrethrins, 1.0% piperonyl butoxide or PBO and 82.9% silica dioxide (amorphous form harvested from freshwater diatoms)), contains plant-derived or botanical ingredients considered by some to be "organic." Piperonyl butoxide is extracted from the South American Ocotea (sassafras) tree, reacted with butylcarbityl and added as a synergist for pyrethrins. There are mixed opinions on the status of PBO as "organic" because of the chemical reaction involved in the extraction process. Regardless, Organic™ Solutions is formulated with botanical pyrethrins extracted from the powdered, dried flower head of the African-grown chrysanthemum, *Chrysanthemum cinerariaefolium*, in contrast to the synthetic active ingredients contained in other products evaluated in this trial. Bifenthrin, cyfluthrin and deltamethrin are pyrethroid insecticides which differ from pyrethrins because they are synthetically produced molecules that have relatively longer persistence when applied to the soil. Soil persistence documented through soil analysis bears this out except on Day 30, when sampling procedures used may have affected the amount of bifenthrin in the treated soil (**Table 2**). Acephate is an organophosphate insecticide which breaks down relatively quickly when in contact with organic material in soils.

Toxicological properties of treatments. Factors to be considered when selecting a product for treating imported fire ant mounds are discussed in fact sheet FAPFS036 posted on the web site, http://fireant.tamu.edu. Soil persistence can be a selection factor and in certain instances when products with less soil persistence are desirable. The mode of activity of natural pyrethrins and synthetic pyrethroids is similar (they destabilize nerve cell membranes and are relatively quick-killing). However, other toxicological properties and cost considerations may also be important.

As active ingredients, pyrethrins are relatively less toxic than pyrethroid insecticides (**Appendix 1**). Conversely, when formulated and directed for use, toxicity of applied material can be dramatically changed. Both the toxicity of applied material and the amount of material used in the treatment are additional variables affecting insecticide "load" that results in the environment. Because of these factors, making direct comparison between products when selecting the "least toxic" materials can be difficult.

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Table 1. Number of active red imported fire ant mounds/10 mounds treated or per plot following treatment with selected ant mound insecticide product treatment, Nov. 2002, Comal Co., TX.

	Active ant mounds/10 mounds/plot (4 replications) or total/plot*					
Treatment	Day 2	Day 7	Total	Day 14	Day 30	Total
Untreated control (dry)	9.75a	9.75a	10.50a	9.75a	9.75a	12.50a
Untreated control (wet)	8.25a	9.25a	9.25a	9.75a	8.50a	9.75a
Organic™ Solutions (pyrethrins, PBO + DE) - solution	0.25c (97.4%)	0.00c (100%)	0.75cd	0.00b (100%)	0.00b (100%)	2.00c
Bayer® Advanced Lawn® (cyfluthrin) - watered in	0.00c (100%)	0.00c (100%)	0.75cd	0.00b (100%)	0.00b (100%)	2.00c
Ortho® Granules 2 (bifenthrin) - watered in	0.00c (100%)	0.00c (100%)	0.25d	0.00b (100%)	0.00b (100%)	3.00bc
Terro® Fire Ant Killer (deltamethrin) - dry	3.00b (69.2%)	1.75b (82.1%)	2.50b	0.50b (94.9%)	0.25b (97.4%)	2.75bc
Surrender® Brand (acephate) - dry	2.50b (74.4%)	0.25c (97.4%)	2.25bc	0.25b (97.4%)	0.25b (97.4%)	4.25b

* Means (average values) in columns followed by the same letter are not significantly different using analysis of variance (ANOVA) using Duncan's Multiple Range test at the 0.5 level of probability. Percent controls are in parenthesis under the mean values.

Table 2. Soil analysis conducted by Environmental Laboratory Services, Austin, TX, on soil samples from the Ingram Ranch, Nov. 2002, Comal Co., TX.

Insecticide	Day 0 Pre-Trt	Day 0 Post-Trt*	Day 2 Post-Trt	Day 7 Post-Trt	Day 30 Post Trt
pyrethrins[o]	ND[a]	170	140	140	100
bifenthrin	ND[a]	4000	1200	480	45
cyfluthrin	ND[a]	5800	2300	1700	1200

[a] ND - Not Detected at the Reporting Limit
* Values listed in ug/kg.
[o] Organic™ Solutions product contained 0.2% pyrethrins formulated with piperonyl butoxide and silica dioxide or diatomaceous earth, Ortho® product contained 0.2% bifenthrin, Bayer® product contained 1.0% cyfluthrin.

Appendix 1. Toxicological properties of Imported Fire Ant Insecticide active ingredients and formulated products (from Agricultural Chemicals, Book I, Insecticides. W.T. Thompson 2001, Product MSDS's).

Botanicals

pyrethrins - CAUTION; (rat) Oral LD_{50} : **1,500 mg/kg**
Organic™ Solutions Fire Ant Killer (rat) Oral LD_{50} : **>5,000 mg/kg**

Pyrethroids

bifenthrin - WARNING; Class II; (rat) Oral LD_{50} : **54.5 mg/kg**
Ortho® Fire Ant Killer Granules II (rat) Oral LD_{50} : **>5,000 mg/kg**

cyfluthrin - CAUTION; (rat) Oral LD_{50} : **500 mg/kg**
Bayer® Advanced Lawn® Fire Ant Killer (rat) Oral LD_{50} : **3084 mg/kg**

deltamethrin - WARNING; (rat) Oral LD_{50} : **128 mg/kg**
Terro® Fire Ant Killer Dust Oral LD_{50} : **>5,000 mg/kg**

Organophosphates

acephate - CAUTION; Class II; Tech (rat) Oral LD_{50} : **947 mg/kg**
Surrender® Brand Fire Ant Killer (rat) Oral LD_{50} : **1030 mg/kg**

Community-wide Imported Fire Ant Management in Texas

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Abstract

Managing the red imported fire ant, *Solenopsis invicta* Buren (Hymenoptera: Formicidae) has been demonstrated to dramatically reduce the cost insecticide use, maintain control of fire ants and eliminate problems caused by the ant. This demonstration, conducted in the Lago Santa Fe community in Galveston County, Texas, demonstrated several recent advances in conducting community-wide programs, including: 1) the effectiveness of the "hopper blend" treatment (50:50 hydramethylnon plus s-methoprene ant bait); 2) application methods such as the truck-mountable industrial "bait blower"; and 3) scheduling treatments to reach a goal of maximum control for an athletic event, the 2002 National Ski Championships.

Summary

Managing fire ants on a community-wide basis at Lago Santa Fe, Santa Fe, TX has proven to be effective. Site assessment, proper application and judicious use of a hopper blend treatment of hydramethylnon + s-methoprene fire ant bait resulted in 89% control of fire ants in this community 8 weeks after application. As a result, there was minimal need of single mound treatments.

Problem

The red imported fire ant, *Solenopsis invicta* (Buren (Hymenoptera: Formicidae), has become an important economic and health threat in urban Texas. According to a 1998 study conducted by the Department of Agricultural Economics, TX A&M University, of fire ant related costs in Dallas, Fort Worth, Austin, San Antonio, and Houston, fire ants have serious economic effects for these metro areas of Texas. Households experienced the largest costs among sectors examined with an average of $151 per household spent annually which included repairs to property and equipment, first-aid, pesticides, baits, and professional services. Treatment costs accounted for over 50% of this total cost. A full damage assessment for Texas must include additional sectors, and the estimated costs of $581 million per year for the selected sectors underscore the impact of this pest.

In Houston the average medical treatment costs per household of $25.46. The duration of injury for children and adults was 6.6 days and 5.6 days, respectively. The fire ant limits outdoor activities and homeowners and producers incur added costs in managing the fire ant (see Lard et al. 2000, "The Economic Impact of the Red Imported Fire Ant on the Homescape").

Objectives

During the past 5 years the Texas Imported Fire Ant Research and Management Project has championed the development of several "products/processes" that can be used in addressing the goal of eliminating the fire ant as a pest of major economic and health significance (Drees and Frisbie 2002). Fire ant management is centered around the "Two-Step Method" of fire ant control (see publications B-6043 and L-5070) which relies on the broadcast application of an effective ant bait product, followed by selective individual ant mount treatment if necessary. One of the most publicly visible components of the project has been the demonstration of the concept

of managing fire ants on a community-wide basis - even though funding has been restricted by the policy that no dollars could be used to buy or apply pesticides (i.e., no pesticide give-away programs).

Demonstrations of community-wide fire ant management have documented that the cost of pesticides people had been buying and applying to try controlling the ants on a property-by-property basis can be reduced by 84% (Riggs et al. 2002). Also, new tools to apply broadcast bait product treatments are in place and ready for use: 1) Descriptions for modifications needed to apply ant bait products by air are on the project's web site (http://fireant.tamu.edu under "management", entitled "Broadcast Application Guide"); 2) A prototype truck-mountable "bait blower" capable of treating neighborhoods by driving down the street at 10 to 30 miles per hour has been developed (Drees and Frisbie 2002). The mounting of bait spreaders to ATV's and other multiple use vehicles common to urban communities have been demonstrated and mounts for these various spreaders can be purchased through various dealers, and 3) Bait combinations and new "safer" bait active ingredients have been highlighted (see Fire Ant Trails 3(6), 5(2) and 6(2)).

Several recent advances in conducting community-wide fire ant management programs were highlighted in this demonstration, conducted in the residential community of Lago Santa Fe, Galveston County, TX. Lago Santa Fe is a private water ski community located 25 miles south of Houston, TX. This Community encompasses approximately 100 acres, with 4, 0.5 mile X 200 ft wide lakes, designed for water skiing events. Forty-eight homes border the 4 lakes in 1 acre lots. The objective was to utilize as many "items" championed by the Fire Ant Project in this community-wide effort.

Materials and Methods

In the Fall of 2001, representatives from the Community of Lago Santa Fe asked the Texas Cooperative Extension for help in controlling fire ants in their neighborhood. This Private Lake Community was to host the 2002 National Ski Championships, and the U.S. Water Ski Open in August of 2002. They also were to host several regional events leading up to the 2002 Nationals and Open. They needed to control the fire ant since they were expecting around 5,000 visitors to their community for these upcoming events. This Community would also host these same events in 2003.

Site and Fire Ant Activity Assessment. Fire ant activity was determined by counting the active fire ant mounds in 0.25 acre circles in 8 undeveloped lots within the community (**Table 1**). A mound was considered active, if after disturbed with a prodding rod, fire ants emerged within a 15 second waiting period. An adjacent pasture area was monitored periodically to make sure fire ant activity monitored in the treated area was due to treatments and not other environmental conditions (**Table 1**).

Products. Because of the nearness of events (some starting in June) we decided to use a combination of hydramethylnon and s-methoprene. The application of the 50:50 "hopper blend" of 0.75 lb. hydramethylnon fire ant bait (ProBait™, Amdro ® or Siege ® Pro Fire Ant Bait) blended with 0.75 lb. s-methoprene (Extinguish™ Professional Fire Ant Bait) or other "juvenoid" Insect Growth Regulator (IGR) fire ant bait product, applied 1.5 pounds of the blended products per acre has repeatedly resulted in a relatively quick and long-lasting suppression of red imported fire ant mound numbers in replicated tests (see http://fireant.tamu.edu under "research" and "applied research "). None of these products applied alone produces this effect.

This combination offered the quick action of metabolic inhibitor (hydramethylnon) to make sure fire ants were contained before the June events, and the extended activity of an IGA (s-methoprene), for continued containment into the August event. Also, the Texas Department of Agriculture (November 30, 2001 memorandum from Phil Tham, Deputy Assistant Director for

the Pesticide Programs Division) had issued a 24(c) (Special Local Needs) registration for the "hopper blend" application of Amdro® or Siege® Pro plus Extinguish Professional Ant Bait (SLN TX - 010016). We wanted to demonstrate that this combination would work well in an urban setting.

If extra baiting was necessary as the events dates drew closer, Justice Fire Ant Bait was chosen because of the active ingredient (spinosad) had been recognized as a "natural substance" by the National Organic Standards Board, and it is one of the fastest acting baits (see FAPFA039, "An Organic Two Step Method For Fire Ant Control" and Fire Ant Trails3(6) and 6(2)).

Finally, because we were trying to control fire ants around man-made lakes that had several fish species, Orthene® Fire Ant Killer containing 50% acephate was chosen over the synthetic pyrethroid dusts for single mound treatments to counter any run-off issues.

Bait Applicators. Three applicators/spreaders were used for the broadcasting of the fire ant bait. A handheld spreader set on the smallest setting was used. The homeowner or volunteer was given 1.5 lb of the blended bait product to spread over a 1.0 acre lot. A truck mounted "bait blower" (Drees and Frisbie, 2002) was used to spread bait along the roadside and in undeveloped lots. A GT-77 model Herd Spreader mounted to an ATV was used to spread bait around lake areas. Both the bait blower and ATV mounted spreader were calibrated to spread 1.5 lb bait/acre.

Results and Discussion

Ant mound counts from 1/4 acre circles in 8 undeveloped lots (**Table 1**) showed an average of 168 mounds/acre. Baiting was initiated on April 18, 2002. Six weeks after treatments circle counts indicated control levels greater than 67%. A count taken in June before preliminary events were to start in July, showed control levels just above 89%.

A count taken one month before the 2002 Ski Nationals indicated control still better than 85%. It was decided at this time to go ahead and use the Justice Fire Ant Bait around those high-traffic areas where exhibitors would be placing product displays, to maintain a high level of control in that area. Heavy rains fell the day before the week long 2002 Ski National and 2002 Open events, and during the events. Greater than 9 inches of rain fell during that week.

Minimal use of Orthene was required to treat single mounds. Less than 1.5 lb of the Orthene Fire Ant Killer was used during this time, to treat mounds that appeared after all of the rain.

Well after the event, a final count taken before the scheduled fall applications of fire ant bait still showed greater than 60% control of the fire ant. It should be noted that fire ant pressure in the adjacent untreated pasture remained at the level for the duration of the study (**Table 1**).

The Lago Santa Fe Community Fire Ant Project was great a success. During the event, informational packets about imported fire ant management were provided to participants together with temporary tattoos and T-shirts promoting the community-wide fire ant program. It showed that communities working together with the right tools used at the appropriate times will give good lasting control of a fire ant problem. The goal of 100% control may not be reached using the methods employed, but the chance that a resident or visitor may come in contact with the fire ant was dramatically decreased. Of all of the problems encountered during the 2002 Ski Nationals and 2002 Open, fire ants did not even make the list.

Literature Cited

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Table 1. Red imported fire ant mounds per 0.25 acre circle plot, Lago Santa Fe, Galveston Co., Texas, treated with the hopper blend of Extinguish™ (s-methoprene) and ProBait™ (hydramethylnon) fire ant baits (0.75 lb each product blended together and applied using ground application equipment) on April 18, 2002.

	Number of red imported fire ant mounds/0.25 acre		
Lot Number	April 18 (pre-treatment)	May 28 (6 weeks)	June 12 (8 weeks)
Treated area:			
32	38	8	1
25	48	15	1
24	32	11	3
23	29	11	5
20	41	16	8
2	55	23	9
1	48	18	4
46	47	8	6
Mean ± Stand. Dev.	42.25 ± 8.88	13.75* ± 5.23	4.62* ± 2.97
T =		7.8243	11.3686
n = 8; d. f. = 8; *P* =		0.0000	0.0000
Percent reduction:		-67.46%	-89.07%
Untreated area (plot):			
1	34	27	28
2	27	28	17
3	12	10	13
4	14	15	17
Mean ± Stand. Dev.	21.75 ± 10.53	20.00** ± 8.91	18.75** ± 6.44
T =		0.2537	0.4859
n = 4; d. f. = 6; *P* =		0.4041	0.3221
Percent reduction:		-8.05%	-13.79%

* Mean significantly different ($P \leq 0.05$) from pre-treatment mean using the Student *T* test (Microstat).

** No significant reduction in mean number of fire ant mounds per plot