

**Copperas Hollow Country Club  
Caldwell, TX**

Robert Puckett, Extension Assistant,  
Alejandro Calixto, Extension Associate, and  
Bastiaan M. Drees, Professor and Extension Entomologist,  
Texas Cooperative Extension, Texas A&M University System  
College Station, TX

**Introduction**

Copperas Hollow County Club, a 9-hole semi-private course is located about 5 miles southwest of Five Eagle Ranch (site of phorid releases). The site is approximately 63 acres in size and is a public/private golf course (**Fig. 1**). Previous fire ant treatments were made on an individual mound basis when complaints from golfers were received. Fire ant infestation ranged from heavy to slight across the property. Copperas Hollow Country Club (979.567.4422). Note: now under new management; Mr. Frank Bush. Brian Barton is the Board Member who provided the contact, (979.567.0682).

**Objective**

The objectives of the treatment regime selected were to minimize human-ant contact and minimize cost. One experimental component included in the design addressed the questions:

1) Does treating the rough slow re-infestation of fairways?; and 2) Is TopChoice® worth the cost versus multiple applications of Extinguish Plus® on greens?

**Methods**

***Monitoring / Sampling***

Fire Ants

Preliminary monitoring of fire ant activity was conducted in June, 2005, using a hot-dog lure method. Three equally spaced lures (1/2-inch thick Bar-S hot dog slices) were placed on each tee box, four lures were placed at N, S, E, &W compass points at each green, and lures were placed at 200 ft. increments in the middle of each fairway. Hot dog lures were placed on the ground with temperatures between 70-95°F and no rain. After 30-60 minutes, lures were observed for presence or absence of fire ants and the numbers of positive hits were recorded. All subsequent evaluations were conducted in this manner.

If more than 30-40% of the lures (3 or 4 out of 10) have fire ants, then a treatment is recommended.

Phorid Flies

Phorid flies were sampled in July 2007 by deploying transects of five PTS-Traps (Puckett, R.T., A. Calixto, C. Barr, and M.L. Harris. 2007. Sticky Traps for Monitoring

*Pseudacteon* Parasitoids of *Solenopsis* Fire Ants. Environmental Entomology, Vol. 36, No. 3 pp.584- 588).

*Thelohania solenopsae*

Fire ants were collected from 5 mounds within each fairway on June 31, 2007. This resulted in a uniform sample of the overall population of fire ants within the site boundary. These ants were returned to the laboratory where they were processed (ground, stained, and mounted on permanent slides) and assessed for the presence of *T. solenopsae*.



**Fig. 1** Aerial treatment map of Copperas Hollow Country Club, 2005.

*Treatments*

Bait applications: We conducted ground applications using commercially available bait spreaders mounted on an all-terrain vehicle (**Fig. 2**). Spreader equipment was calibrated to ensure baits were applied within maximum label allowance.

Dates and times of monitoring and treatment were coordinated with club personnel to avoid conflicts with course activities and public use. Course personnel were present during treatments.

Treatment approach: Tees and greens are very uniform in size making for good replication of treatments. Pesticide treatments at the site were based on human use patterns and were designed to maximize control and minimize costs. The “targeted” treatment regime selected included the following applications: high traffic areas were treated with Advion® (indoxacarb) bait for quick suppression. TopChoice® (granular fipronil) was applied at the same time to provide long-duration control. Only about 4 acres were treated in this manner. Fairways were treated with Extinguish Plus® as were half the roughs.

**2005 Treatment Summary:**

Pool, Clubhouse, Putting Green: Advion® + TopChoice®

Tee Boxes: Advion + TopChoice

Fairways: Extinguish® Plus

Holes 1 - 5: Greens: Advion + TopChoice; Roughs: Extinguish Plus

Holes 5 - 9: Greens: Advion + Extinguish Plus as needed; Roughs: no treatment

Application:

Manual = 2 hrs in the morning

Motorized = 3 hours in the evening

**2006 Treatment Summary:**

Tee Boxes, Greens, Pool and Clubhouse: Over'n'Out!® (Fipronil)

Fairways: AmdroPro®/Extinguish® (Hopper Blend)

Motorized and Manual = 2 hours in the morning

**2006 Supplementary Treatment Summary:**

Fairways Bordered by Pastures: Once & Done® (Indoxacarb)

Entire Course, Pool and Clubhouse: AmdroPro®/Extinguish® (Hopper Blend)

Motorized and Manual = 2 hours in the morning

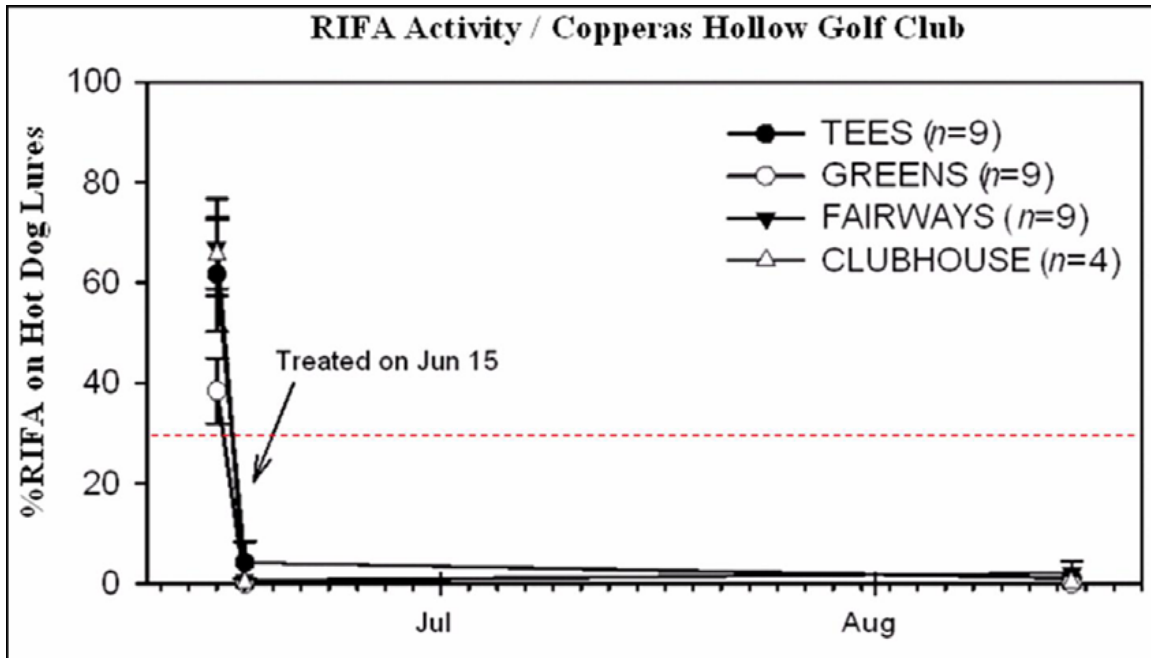


**Fig. 2** All terrain vehicle and commercial spreader used for ground applications.

## **Results and Discussion**

### Fire Ant Activity

The results of the 2005 work demonstrated that the treatment regimes were equally successful in terms of suppressing fire ant populations throughout the facility (**Fig. 3**). This suggests that the most economical approach of those tested should be sought in future treatments of the facility. As a result, in 2006 we applied AmdroPro®/Extinguish® (Hopper Blend) on all fairways and Over'n'Out!® (Fipronil) on high-traffic areas (Tee-Boxes, Putting Greens, Pool Area, and Clubhouse).

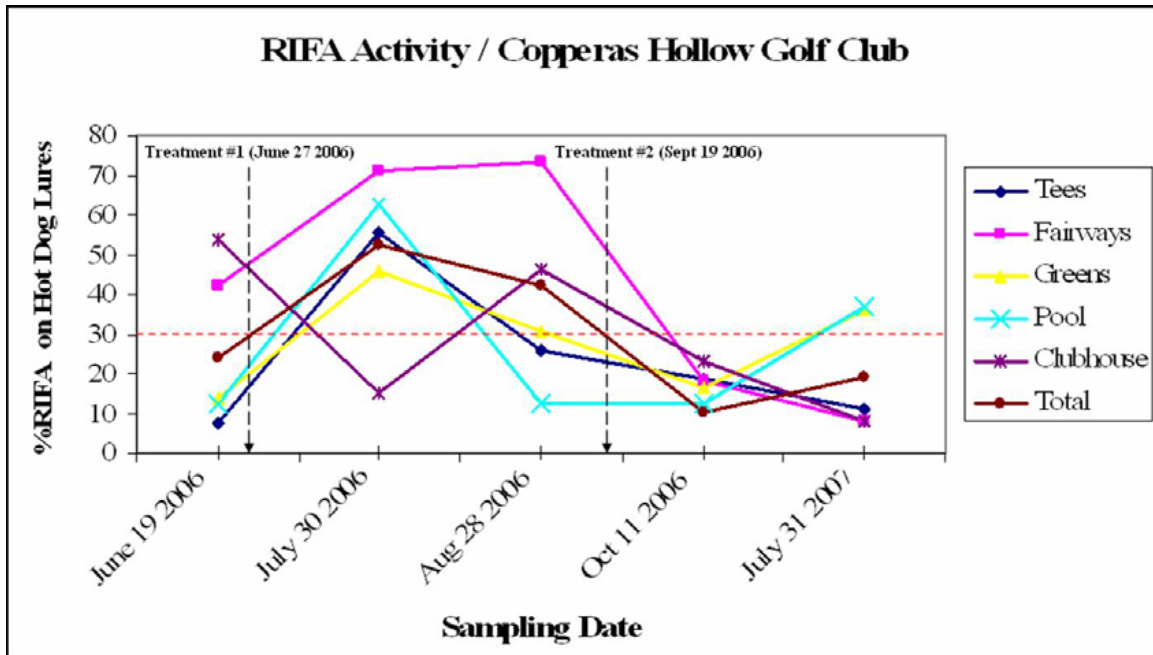


**Figure 3.** 2005 RIFA activity at Copperas Hollow Country Club, Burleson Co., TX.

Pre- and post-treatment evaluations (June 19, 2006 and July 30, 2006 respectively) demonstrated that fire ant populations were above acceptable levels in most areas of Copperas Hollow Country Club (**Fig. 4**). Also, the second post-treatment evaluation (Aug. 28, 2006) indicated that the fire ant population in the vicinity of the clubhouse had increased to an unacceptable level. In addition, the course manager was very unhappy with the number of mounds on fairways bordered by pastures. It is not clear why we experienced a treatment failure in 2006. We speculate that this failure may have resulted from a 'bad batch' of insecticide, but this cannot be confirmed. However, as a result of this failure a supplementary treatment of the course was made on Sept. 19, 2006.

The 2006 supplementary treatment included AmdroPro®/Extinguish® (Hopper Blend) on all areas of the course as well as a Once'n'Done® (Indoxacarb) treatment on the two fairways mentioned above. This treatment suppressed fire ant populations within acceptable levels in all areas of the facility with the exception of the clubhouse (**Fig. 4**). Mound counts indicated a reduction of fire ants on the fairways that received the Once'n'Done® (Indoxacarb) treatment (**Table 1**). The success of this treatment seems to support the position that the failure of the June 2006 treatment resulted from a 'bad batch' of chemical insecticide.





**Figure 4.** 2006 RIFA activity at Copperas Hollow Country Club, Burleson Co., TX. Mean % hits on hot dog lures/course area is presented.

**Table 1** RIFA mounds in selected fairways and % reduction of RIFA mounds pre- & post- additional 2006 treatment, Copperas Hollow Country Club, Burleson County, TX.

	Mounds In Fairway Sample Section	Mounds In Fairway Sample Section	% Mound Reduction
Fairway A	27	11	59.3
Fairway B	56	41	26.8

### Phorid Flies

Phorid flies (*Pseudacteon tricuspis*) were detected at the site in June 2006 and both *P. tricuspis* and *P. curvatus* were detected in July 2007. This site lies within the previously established range expansion of those flies released at 5-Eagle Ranch as part of the biological suppression component of the USDA-ARS Areawide Fire Ant Suppression program.

### *T. solenopsae*

At least one fire ant colony from 8 of 9 areas sampled contained *T. solenopsae* spores and 17 of 45 mounds (37.77%) were infected with spores in July 2007(**Appendix**).

### **Impact**

Aside from one period of extremely high fire ant population density, Copperas Hollow Golf Course has experienced a dramatic reduction of these ants. While the manager of the course was dissatisfied for a brief period of time, during a recent interview he explained that he is extremely pleased with the reduction of fire ants throughout the course and that he intends to continue treatment in a similar fashion as available resources permit.



Mr. Frank Bush (seated left) during economic impact interview with Leon Estes standing right) in 2006.

### **Contacts and Cooperators**

- *Mr. Frank Bush* – Copperas Hollow Country Club / Manager; 979.567.4422.

**Appendix.** Prevalence of *T. solenopsae* within Copperas Hollow Golf Club.

**Location: Copperas Hollow Golf Club**

**Date: 7/31/07**

<b>Plot</b>	<b>Sample</b>	<b>Positive</b>	<b>Negative</b>	<b>Absent</b>	<b>Poor Slide</b>
Hole # 1	1		X		
Hole # 1	2	X			
Hole # 1	3		X		
Hole # 1	4		X		
Hole # 1	5			X	
Hole # 2	1	X			
Hole # 2	2	X			
Hole # 2	3		X		
Hole # 2	4		X		
Hole # 2	5		X		
Hole # 3	1		X		
Hole # 3	2				X
Hole # 3	3		X		
Hole # 3	4	X			
Hole # 3	5		X		
Hole # 4	1		X		
Hole # 4	2		X		
Hole # 4	3		X		
Hole # 4	4		X		
Hole # 4	5			X	
Hole # 5	1		X		
Hole # 5	2		X		
Hole # 5	3	X			
Hole # 5	4		X		
Hole # 5	5			X	
Hole # 6	1	X			
Hole # 6	2	X			
Hole # 6	3	X			
Hole # 6	4	X			
Hole # 6	5	X			
Hole # 7	1		X		
Hole # 7	2	X			
Hole # 7	3		X		
Hole # 7	4		X		
Hole # 7	5		X		
Hole # 8	1				X
Hole # 8	2	X			
Hole # 8	3	X			
Hole # 8	4	X			
Hole # 8	5			X	
Hole # 9	1		X		
Hole # 9	2	X			
Hole # 9	3		X		
Hole # 9	4	X			
Hole # 9	5	X			