The Red Imported Fire Ant
vs
The Green Roof

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TEXAS A&M AGRILIFE EXTENSION

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Headquarters
Friendswood, Texas
11,000 sq ft Green Roof

Jacob White
CONSTRUCTION COMPANY

Background and history

- Design/build approach
- Six intensive green roofs constructed
- Roughly 1.76 acres (.71 hectare)
- Anticipated - Energy Star and LEED certification
- So far – three Platinum, one Silver, one Gold (pending) certifications
- Goals
  - Minimum 50% less energy usage
  - Unique identity within the community
  - Control long term costs
  - Radically lessen impacts by and to water

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2000 West Parkwood
Friendswood, Texas

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251/253 Medical Center Blvd.
Webster, Texas

Aero Photo
727.520.8181
www.aerophoto.com

253 Medical Center Blvd

Image # 90408 6017
Date 04.08.09

48,000 sq ft
Green Roofs

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12900 Gulf Freeway
Houston, Texas

TEXAS A&M AGRILIFE EXTENSION

700 Medical Center Blvd.
Webster, Texas

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JWCC Green Roof

- Intensive Green Roof
- 4” FE 158 Industrial Closed Cell Foam Roofing
- 40 Mil Reinforced Poly with Geotextile Fabric – This Product Only Has Two Seams
- Enka Retain and Drain
- 9” of Engineered Soil
- Plants
- A Whole Bunch of Labor

Texas A&M AgriLife Extension

4” FE 158 Industrial Closed Cell Foam Roofing

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Green Medical Offices

Negative # 61120 497
Date 11.20.06

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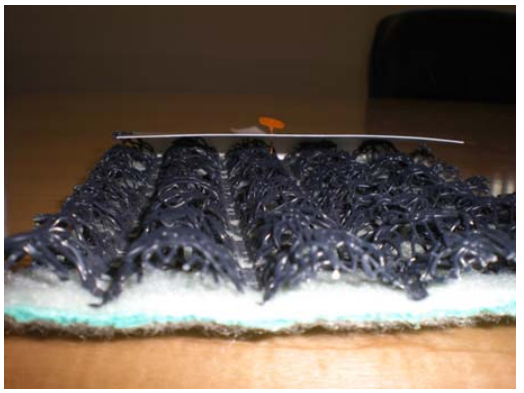
Enka Retain and Drain and 40 mil Poly



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Green Medical Offices

Negative # 61221 507
Date 12.21.06

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Loading Roof

9” engineered soil

Soil/growth media

- Typical soil mixture
- Expanded shale
- Leaf mold compost
- Enriched loam
- Microlife
- Eco-min
- Depth – averages 9” – ranges 8” to 12”
- Saturated weight = 30 pounds

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Finished Green Roof

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The Red Imported Fire Ant

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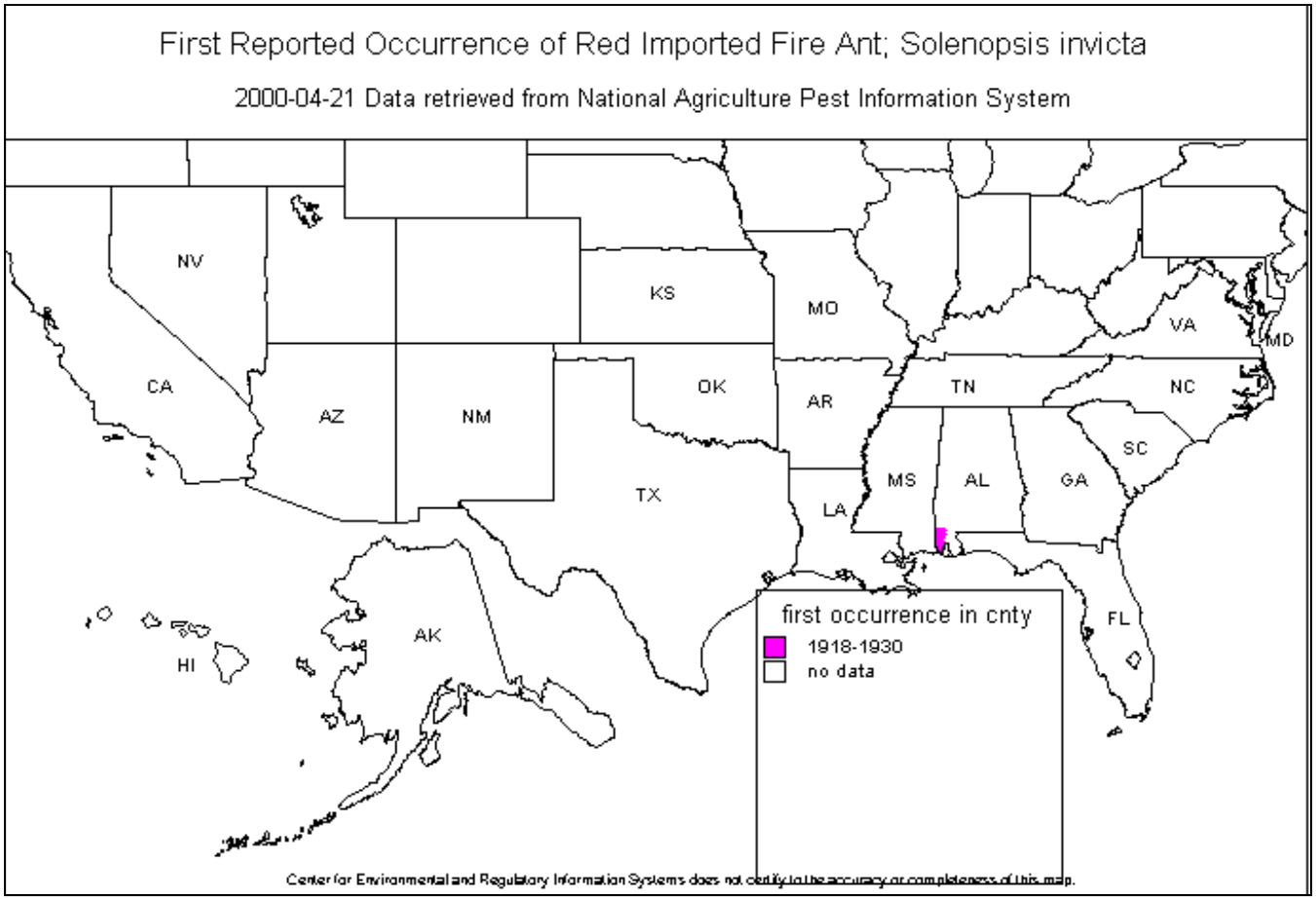
U.S. Arrival & Range Expansion

http://cars.er.usgs.gov



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Red Imported Fire Ant Facts

Solenopsis invicta

Introduction and Spread

1) Fire Ants came to US in 1930's, identified in Texas in 1950's
2) An average "Texas" colony has > 100,000 workers
3) An average "Texas" colony has multiple queens
4) A queen can live 2-5 years
5) Can lay up to 1000 eggs per day
6) From egg to adult in about 3 weeks.
7) Live 6-18 weeks
8) Oldest workers are foragers
9) Polymorphic
10) Loves subtropical environment
11) Nuptial flights, migration, transport
12) Inflicts nasty sting

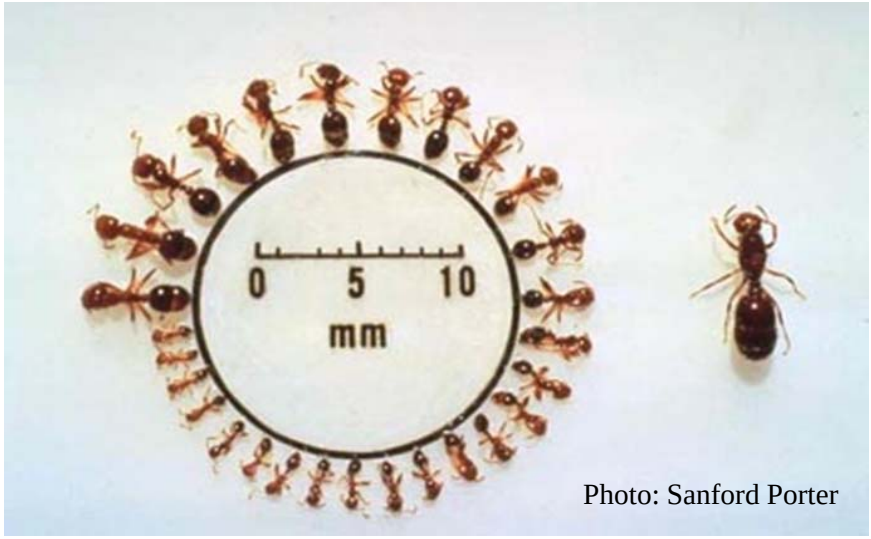
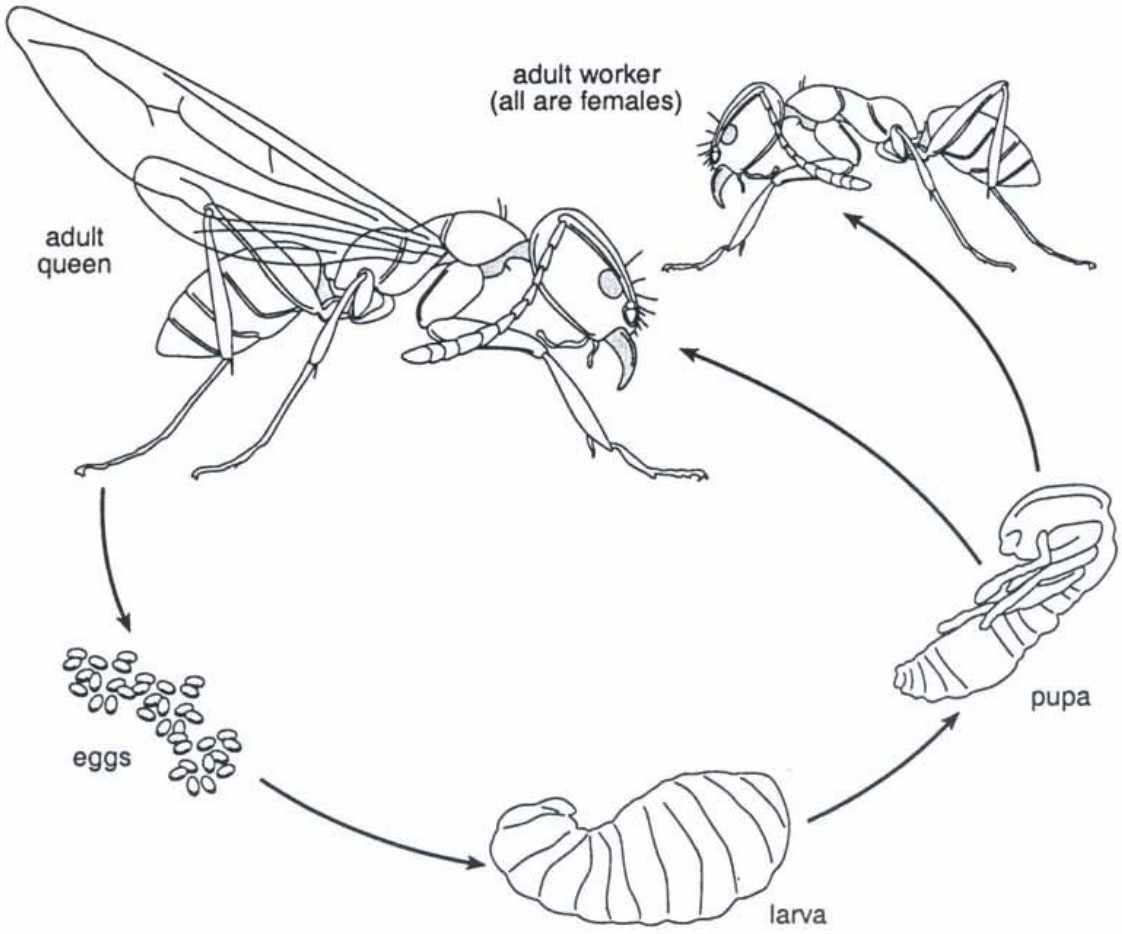


Photo: Sanford Porter

Ant Life Cycle



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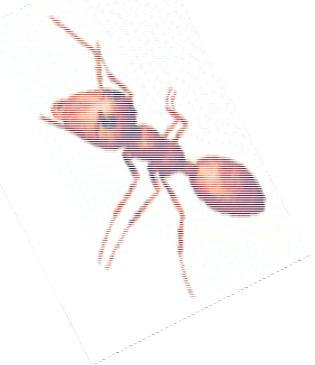
Fire Ants on a Green Roof?



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Fire ant management

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Materials and Methods

Data

- The green roof was assessed May 3, 2011 and 9 subsequent dates for the presence fire ant.
- Foraging ant activity was checked using individual hot dog slice food lures (0.25 inch thick hot dog slices, Bar-S Jumbo Franks) placed in a grid across the green roof.
- 23 lures were used on 5/3/2011, while 34 lures were used on subsequent assessment dates.
- Food lures were checked after 60 minutes and total ants present on the lures were recorded

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Materials and Methods

Roof treatment

- Bait stations were used so as not to directly apply a pesticide to the green roof growing media.
  - All irrigation water applied to the roof is recycled and reapplied on site through a rainwater catchment system.
  - The selection of bait stations was to reduce the chance of pesticide movement from the target site.
  - Additionally, irrigation water is applied several times per day as an energy saving passive cooling method. The frequent irrigation may have disrupted the integrity of a "unprotected" bait product.

- DuPont™ (now Syngenta) Advion® ant bait arenas (30 arenas, 0.1% indoxacarb) were positioned in a grid pattern within the confines of the green roof.

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Materials and Methods

Treatment specifics

- The roof was ~ 10,000 sq. ft., the total active ingredient (0.21 oz) contained within the 30 bait arena's was approximately equal to the active ingredient in a 1.5 pound (0.25 oz) product per acre broadcast application of the Advion® fire ant bait (0.045% indoxacarb).

- Assessments of fire ant activity on the green roof indicated the continued presence of a population of fire ants. So a fall broadcast application of the Advion® fire ant bait (1.5 - 2 pounds product/acre) was applied to the grounds around the Jacob White Headquarters.

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Materials and Methods

Grounds treatment

- Total mound counts were taken on September 22, 2011 before fire ant bait applications and on 4 subsequent dates.
- To determine if a mound was active, visible fire ant mounds were checked using the minimal disturbance method, i.e., mounds were probed with a shovel and if no fire ants appeared after 15 seconds, the mound was considered inactive.
- The fire ant bait product was evenly spread with Scotts® HandyGreen® II Hand-Held Spreader set on smallest opening. In addition to the broadcast application on October 21, 2011, Advion® fire ant bait (0.5 oz/mound) was uniformly distributing around the active mounds with active brood (4 weeks later).

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Materials and Methods

Statistics

- A T-test statistical analysis was used to compare the mean numbers of worker ants observed at lures before and after the arena bait station treatment.
- The mean and 95% Confidence Intervals (CI) for each sampling was estimated and displayed on a time series graph. No overlap among 95% CI indicates significant differences, and overlap indicates no significant differences.
- Enabling the comparison of post-treatment dates to pre-treatment numbers which in this case are consider a Control

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Representative food lure with foraging fire ants as found on green roof during fire ant activity assessments and example of DuPont™ Advion® ant bait arenas placement atop green roof. Galveston County, 2011

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Bait Stations

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Approximate locations of 34 food lures for the assessment of red imported fire ant foraging on green roof, Galveston, Co. 2011.

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Approximate locations of 30 DuPont™ Advion® ant bait arenas on green roof, Galveston County, 2011.

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Grounds around Jacob White Construction Headquarters where the broadcast application of the DuPont™ Advion® fire ant bait was applied, Galveston, Co. 2011.

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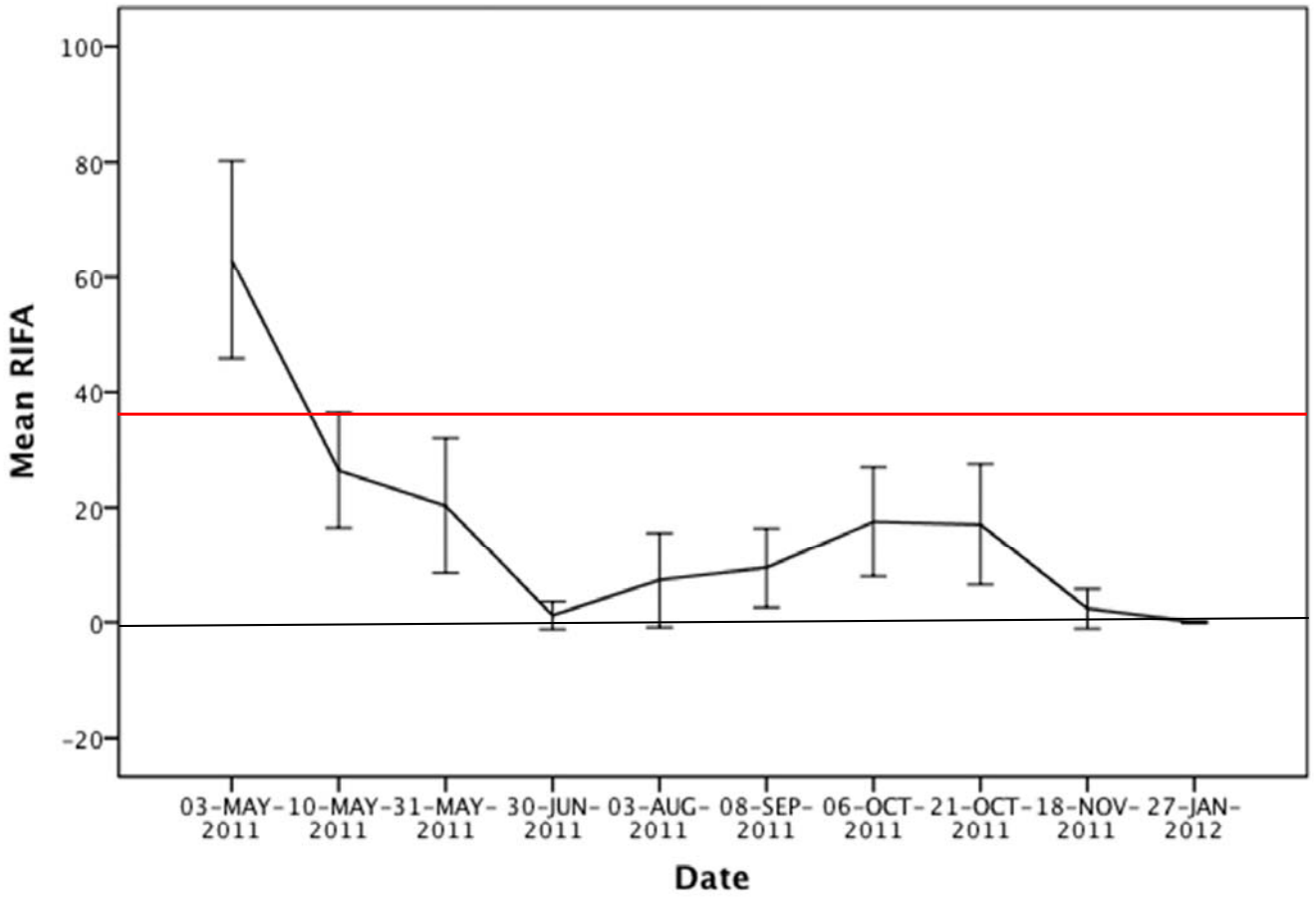
Average number of fire ants per lure



Error bars: 95% CI

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Fire ant management

- Lure (34) dates / fire ant counts
  - 5/3/2011
    - Roof
    - only 23 lures
  - 5/10/2011
    - Roof
  - 5/31/2011
    - Roof
  - 6/30/2011
    - Roof
  - 9/8/2011
    - Roof
  - 9/22/2011
    - 60 mounds on ground (visual count)
  - 10/6/2011
  - 10/22/2011
- Advion applications dates
  - 5/3/2011
    - 30 stations - roof
  - 5/31/2011
    - 12 stations - roof
  - 6/30/2011
    - 2 stations - roof
  - 9/8/2011
    - 13 stations – roof
  - 9/22/2011
    - 1.5 lbs product per acre applied to ground
  - 10/21/2011
    - 30 stations – roof
    - Spot treat with bait 20 fire ant mounds on ground

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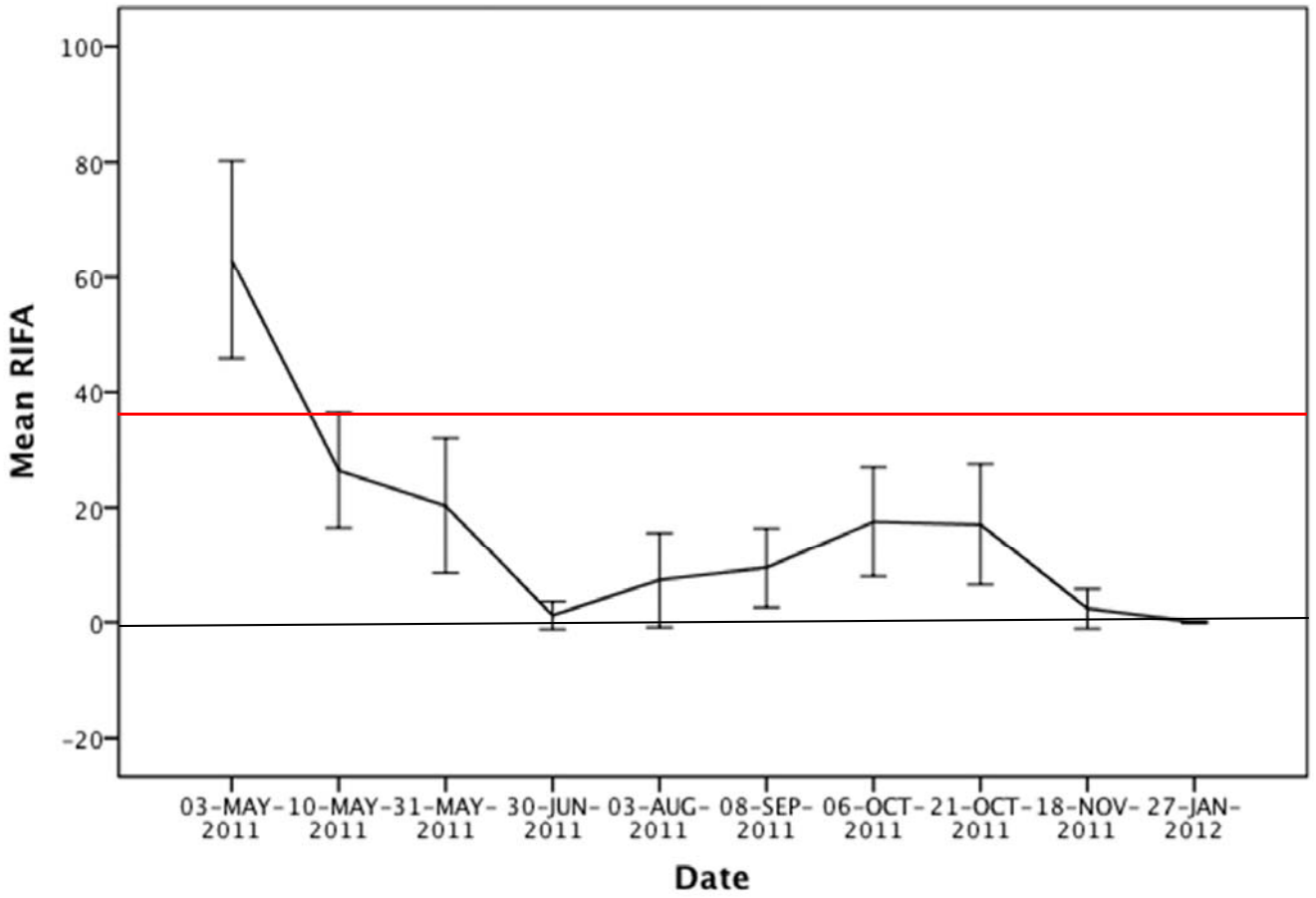
Average number of fire ants per lure



Error bars: 95% CI

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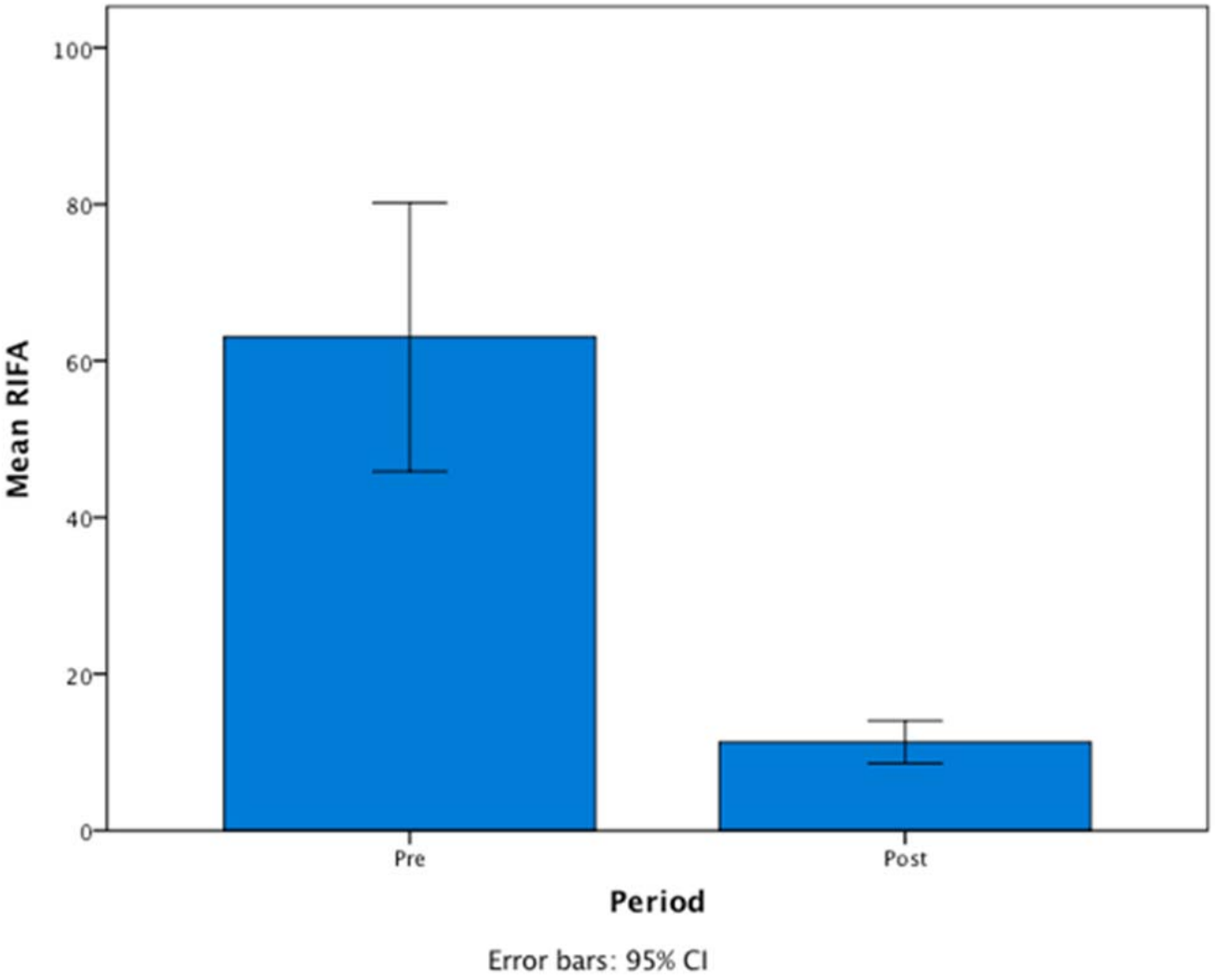
Figure 8: Analysis of mean number of red imported fire ants (RIFA) on food lures over nine assessment periods (May 10, 2011 – January 27, 2012), Galveston County, 2011. No overlap among 95% CI indicates significant differences, and overlap indicates no significant differences



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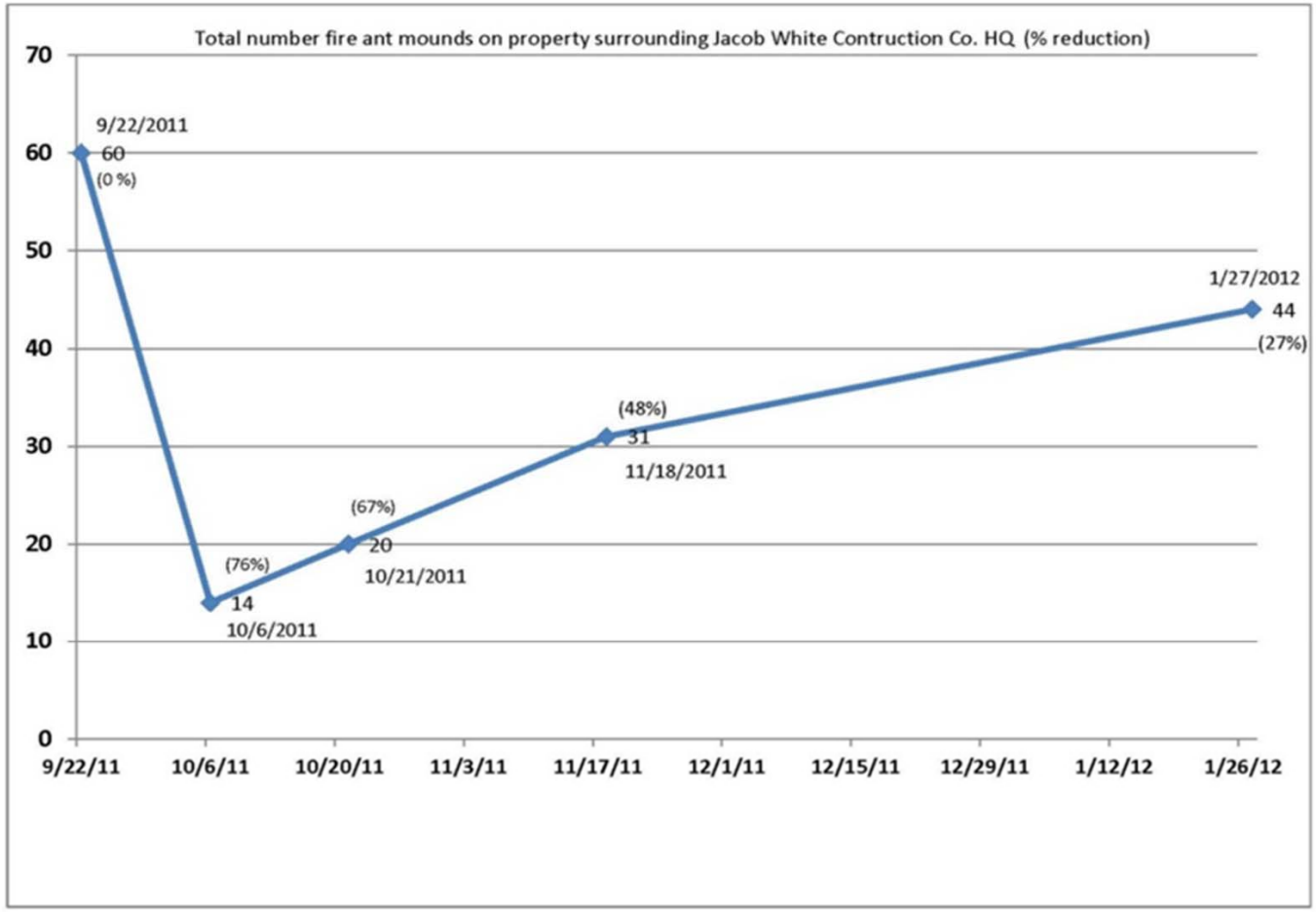

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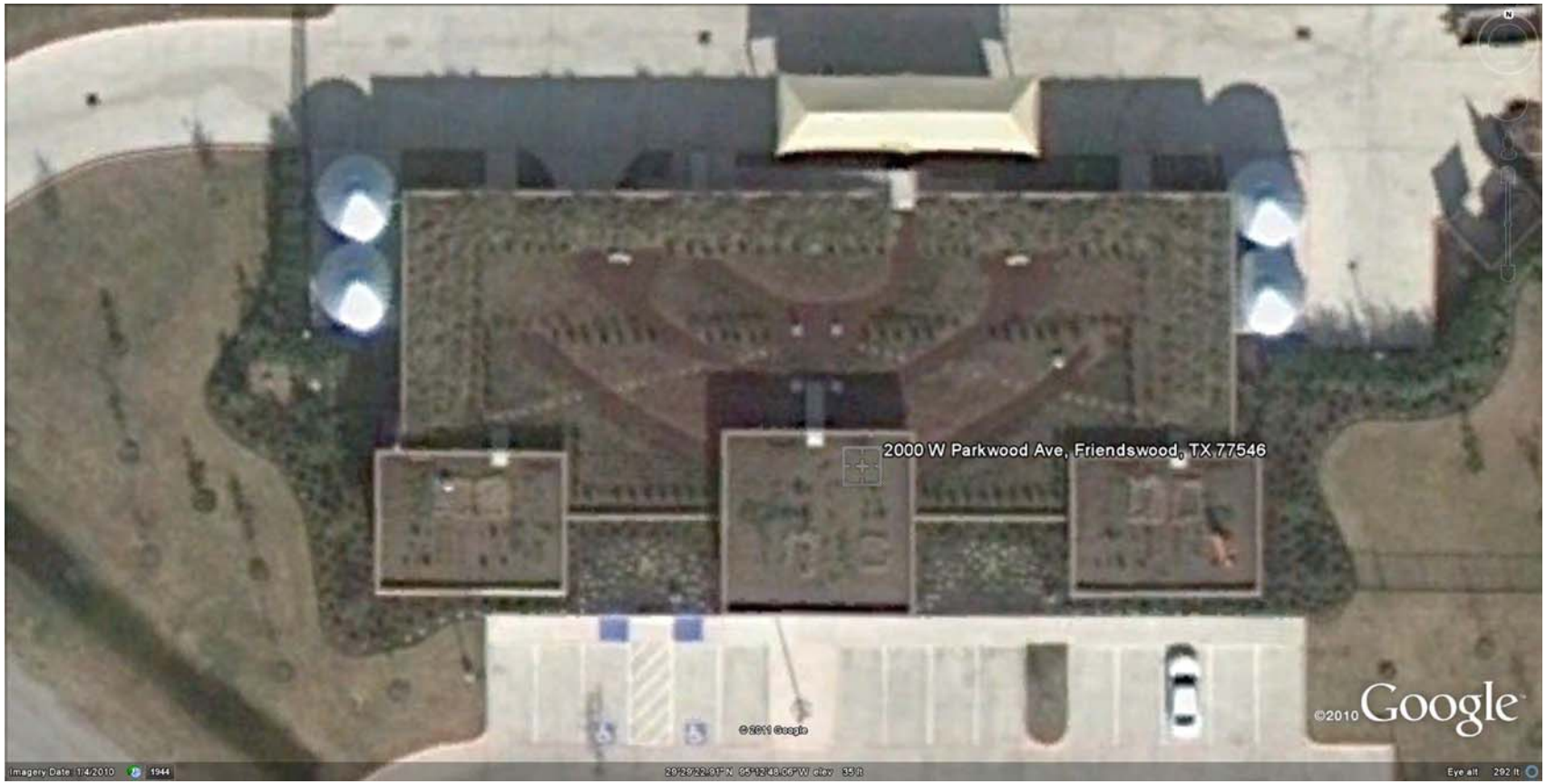
Fire Ants on Green Roof



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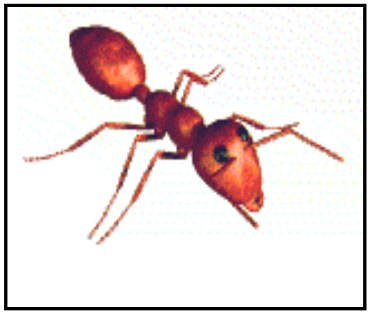
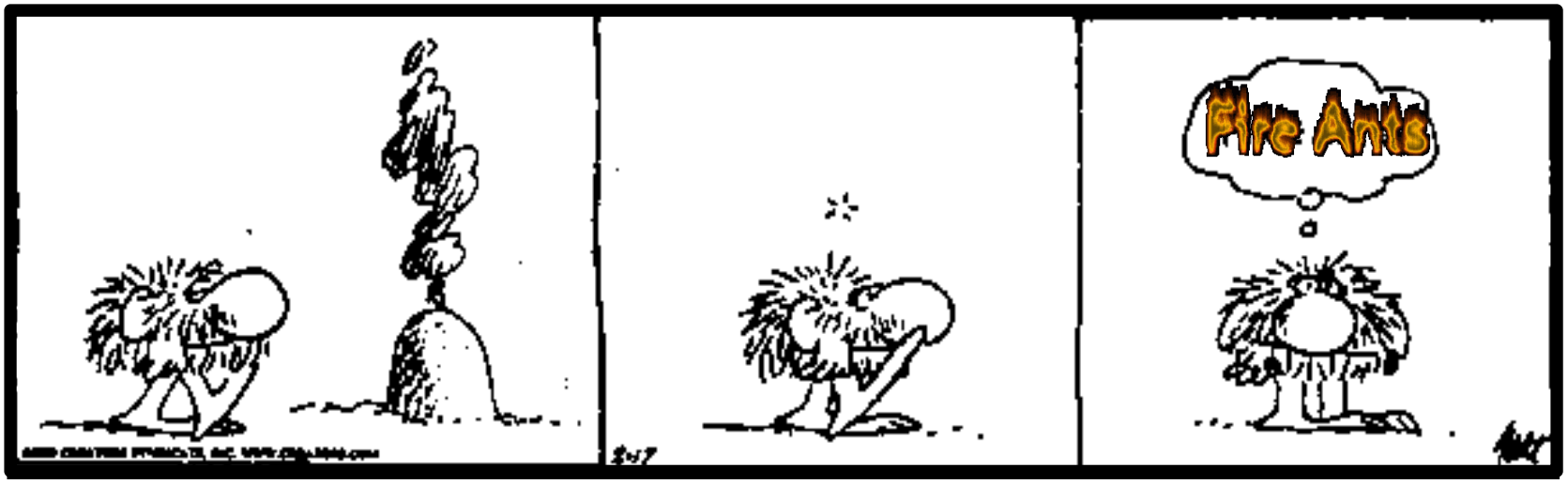


Questions ????



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