



Cryptic



Multiple queens

Little Fire Ant

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Little Fire Ant

What will this presentation cover?

- Most Attractive Survey Bait – Peanut Butter
- Time of Day to Survey for LFA
- Contact Insecticides (bifenthrin, fipronil)
- Effectiveness of RIFA Bait Insecticides
- Effectiveness of Weathered Bait Insecticides
- Soapy Water Dip
- Hot Water Dip
- Drone Technology to Apply Baits

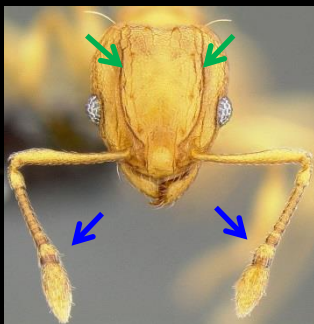
- *Most attractive is peanut butter.**
- *Hot dog and Spam are also attractive.**



Photos by
W. Nagamine

How Would I Find LFA? What would I look for?

- The best time to survey for LFA is in **early morning** or **late afternoon** when they are most actively foraging.
- **Avoid hot sunny days** and mid-day (if you must survey, find shady areas). Will not forage during heavy rainfall.
- **LFA prefer fats not liquid/gel sugar.** Smear peanut butter on a stake (plastic/wood) or in vial to detect LFA (bright paint on the stake or vial to easily find them). Hot dogs or spam in a vial works but not as selective to LFA.
- **Red-orange, slow-moving, and less than 1/16" long.**

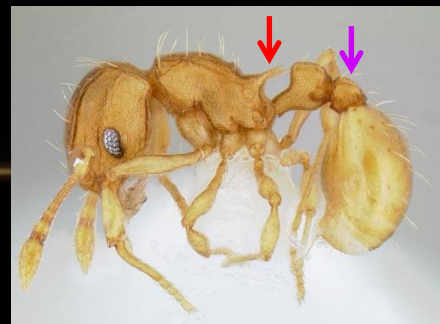


2 grooves

**Two-segmented
antennal clubs**

▪ **long, pointy
spines**

▪ **2 nodes**



Knock-down (direct spray) and Residual Activity of Fipronil (Termidor), and Chlorfenapyr (Phantom) against Little Fire Ant

Treatments:

- 1) Termidor SC 0.06%*
- 2) Phantom SC 0.50%*
- 3) Phantom SC 0.50% and Silwet L-77 0.25%*
- 4) water (control)*

Knockdown:

- Spray (5 ml) directly on 100 workers on filter paper in 400 cc plastic container.*
- Mortality observed at 0.5, 2, 4, 6, 8 and 24 h.*

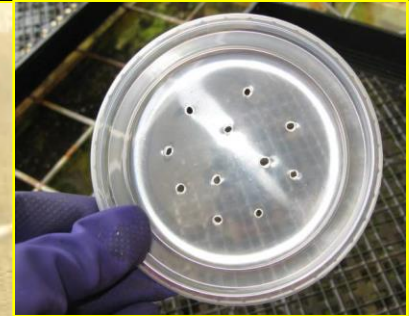
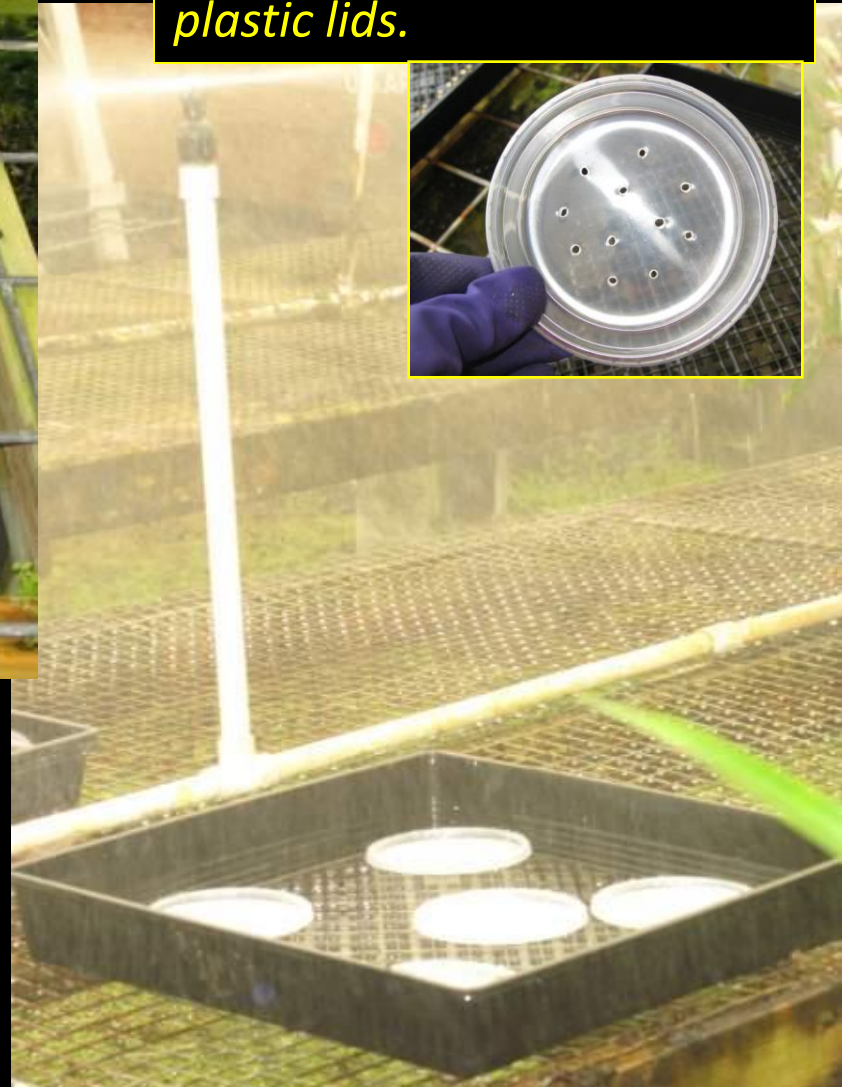
Residual:

- Treatments applied to filter paper and aged 7 days under greenhouse conditions under overhead irrigation (1.0 fl oz per day).*
- Mortality observed at 2-3 day intervals to 21 DAT.*

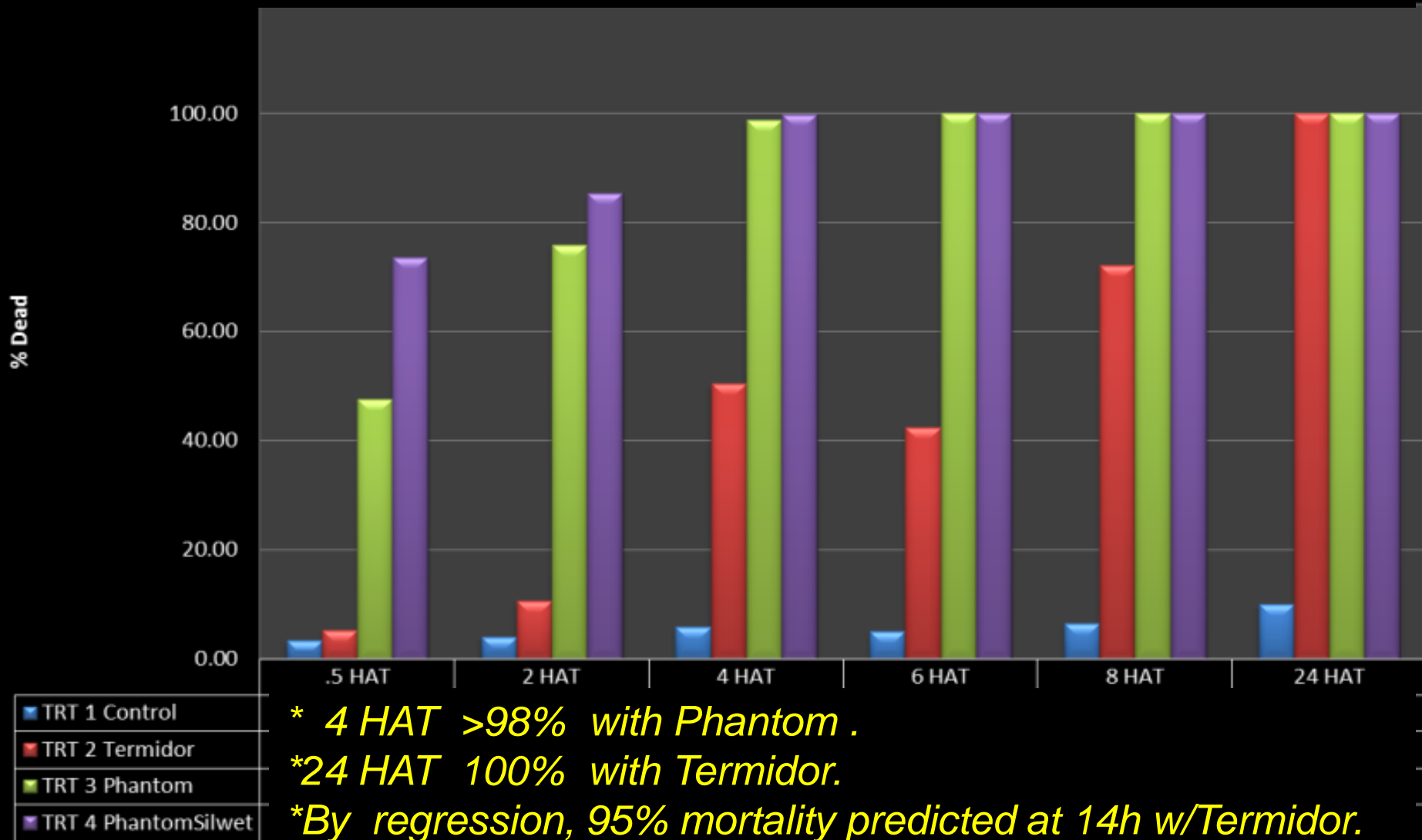
Filter paper impregnated with insecticides were placed on the perforated plastic lids.



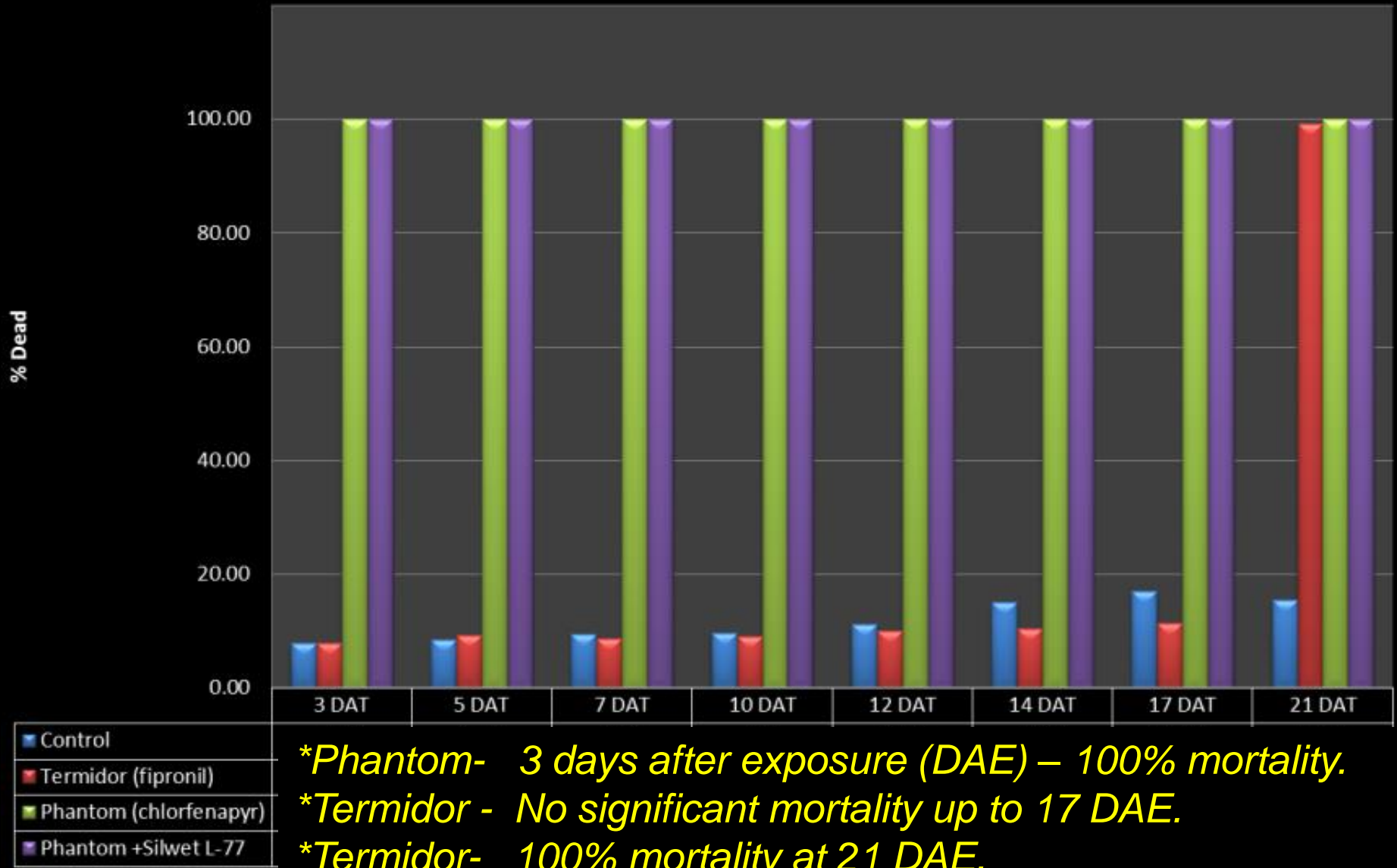
Treated filters exposed to indirect sunlight in greenhouse under an overhead irrigation system (1 fl oz per day) for 7 days.



Direct Spray of Termidor and Phantom on Little Fire Ant



Residual Activity of 7-day aged deposit of Termidor and Phantom



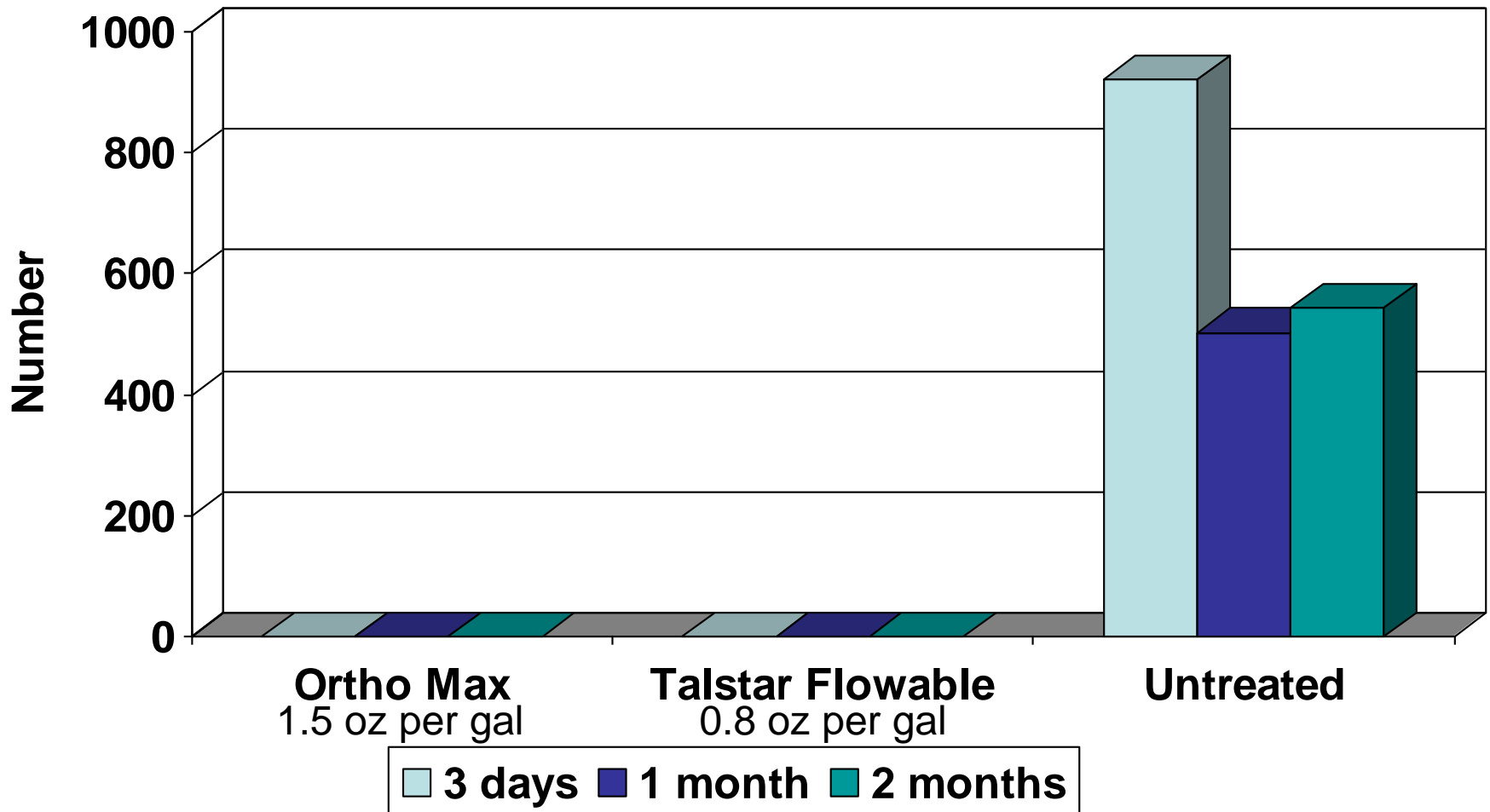
**Phantom- 3 days after exposure (DAE) – 100% mortality.*

**Termidor - No significant mortality up to 17 DAE.*

**Termidor- 100% mortality at 21 DAE.*

**Demonstrates slow-activity of fipronil for horizontal transfer.*

Live Ants within Pots Following Drench Treatment



Treatments Commonly Used to Control LFA in Urban, Landscape, Nursery and Food Crop Sites

❖ Granular – Most of the Red Imported Fire Ant (RIFA)

Baits baits (soybean oil on corn grit) are effective:

*Amdro, Probait, Maxforce Complete (hydramethylnon, metabolic inhibitor)

*Siesta (metaflumizone, sodium channel inhibitor)
Extinguish Plus (hydramethylnon & methoprene, insect growth regulator (IGR)

Distance, Esteem (food label) (pyriproxyfen, IGR)

Advion (indoxacarb, sodium channel inhibitor)

*Most attractive

Limiting effectiveness of granular baits in tropical environment is moisture/rain, causing rancid and moldy ineffective baits.

❖ IGR Gel – Methoprene (IGR, Tango) with vegetable or corn

Bait oil, peanut butter and xanthan gum (food label).

(Vanderwoude 2012, <http://littlefireants.com/>)



Active Ingredients:

1.00% Hydramethylnon, similar AI to Amdro & Pro bait

Mode of Action: metabolic inhibitor

Maxforce Complete granules contain a bait matrix combining sugars, proteins (including silk worm pupae), fats and oils, which accommodate insects' changing nutritional needs.

Ants (Acrobat, **Argentine**, **Big Headed**, **Carpenter**, Cornfield, Field, imported and native Fire, **Ghost**, Harvester, **Odorous House**, Pavement, **Pharaoh**, Thief)

Maxforce® Complete Brand Granular Insect Bait is a ready-to-use product for use indoors and outdoors and around buildings, on lawn, and other non-crop areas: (including school yards, playgrounds, golf courses, and ornamental nurseries).

1 Hour after placement

Little Fire Ant



Control (Peanut Butter)



Maxforce Complete



Pro bait

2 Hours after placement



Control (Peanut Butter)



Maxforce Complete



Pro bait



Attractiveness to peanut butter, Probait, Extinguish Plus & Professional to LFA



Peanut butter



Probait (hydramethylnon 0.73%)

Peanut butter, Probait, Extinguish Plus were Highly attractive to LFA within two hours of exposure to these baits.



Extinguish Plus
(hydramethylnon 0.36%
methoprene 0.25%)



Extinguish
Professional
(methoprene 0.50 %)

Extinguish Professional Consistently was not attractive to LFA possibly due to the repellency of the higher concentration of methoprene.

Little Fire Ant Control

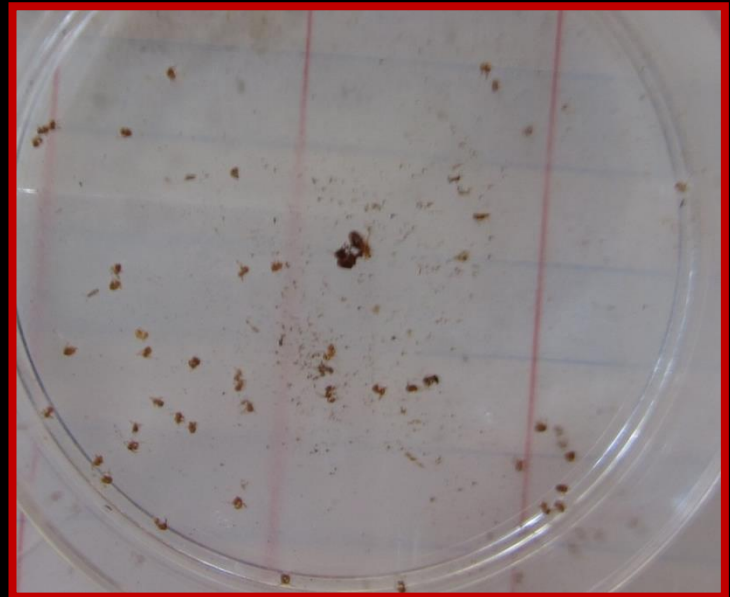
Untreated



Control: Normal nest activity

Extinguish Plus

(0.365% hydramethylnon & 0.25% S-methoprene)



High mortality in colony

Nest Activity 7 WAT

Peanut butter based products were highly attractive.



Hot Shot MaxAttrax Ant Bait₂
(indoxacarb 0.05%)



Raid Ant Baits III
(avermectin B1 0.01%)



Amdro Kills Ants Stake
(hydramethylnon 1.0%)



Raid Double Control Ant Bait II
(avermectin B1 0.05%)



Control (peanut butter)



Combat Source Kill
Ant (fipronil 0.01%)



Control (peanut butter)



Amdro (hydamethylnon
0.73%)



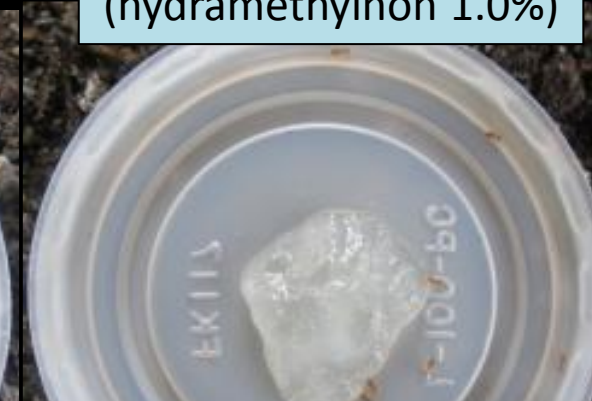
Grant's Kills Ants Ant
Control Gel
(hydamethylnon 1.0%)



PIC Liquid Ant Bait
Killer(sodium tetraborate
pentahydrate 5.0%)



Raid Ant Gel Precision
Placement Bait
(thiamethoxam 0.003%)



TomCat Ant Killer Gel
Bait (indoxacarb 0.03%)

Gels or Liquids were not attractive

Weathered Bait Insecticides

*Baits were weathered on a wire screen (1x1 mm mesh) in a 34.3 L x 34.3 W x 7.6 H cm (1,176.5 cm²) wooden box containing potting media (layer of peat moss, perlite, and vermiculite mix) in a greenhouse with 60% shade cloth and subjected to 2.3 cm rainfall per day via overhead irrigation.



*Extinguish Plus, Maxforce Complete and Probait were weathered for 7-8 days and 14 days.

*Fresh deposits, 7-8 day and 14 day weathered baits of each bait were compared to an unweathered control baits.



Control (peanut butter)



Probait (hydramethylnon 0.73%)

**Fresh
Versus
Weathered
Probait**



7 DE Probait (hydramethylnon 0.73%)



14 DE Probait (hydramethylnon 0.73%)

**Completely
moldy at 7 DE**



Control (peanut butter)

Fresh Versus Weathered Extinguish Plus



Extinguish Plus (hydramethylnon 0.365%, S-methoprene 0.250%)



8 DE Extinguish Plus (hydramethylnon 0.365%, S-methoprene 0.250%)

**Ants attracted
to 7 & 14 DE
with less mold**



14 DE Extinguish Plus (hydramethylnon 0.365%, S-methoprene 0.250%)

Weathered Metaflumizone Corn Grit Bait Against LFA



Amdro Pro



Fresh Siesta



7 DE Siesta



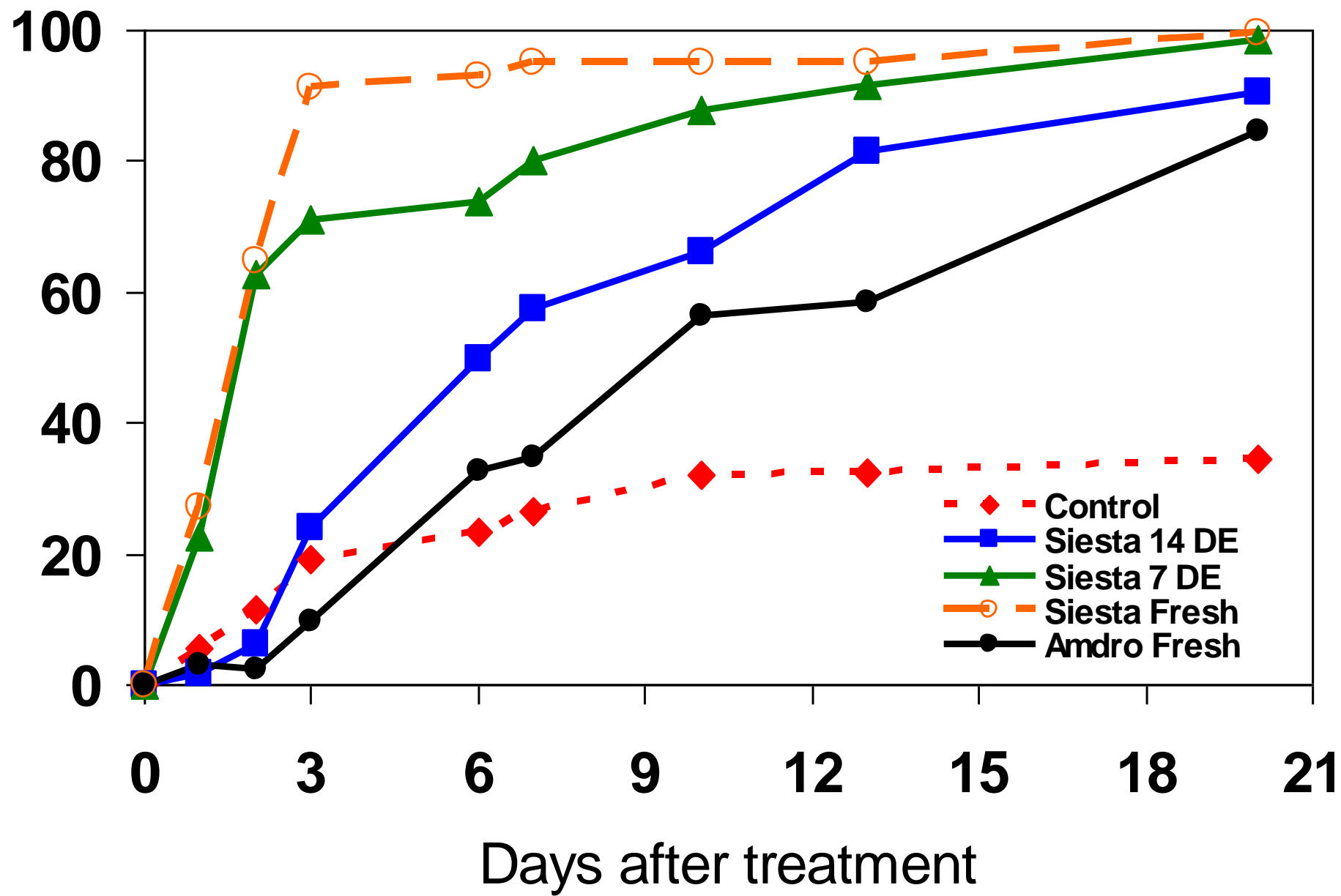
14 DE Siesta

*Metaflumizone (Siesta, Altrevin) corn grit baits placed on a wire screen (1 x 1 mm mesh) outdoors on a nursery bench for 7 d (rainfall-6.7 cm) or 14 d (rainfall-15.5 cm).

*Fresh and weathered baits exposed to LFA colonies with ≥ 100 workers, at least one queen, and a small portion of brood housed in a plastic container (20W x 34L x 11cm)

Fresh and Weather Bait Insecticides Against LFA

Mortality, %



Summary of Baits against LFA

- ❖ Peanut butter is the most attractive substance to workers.
- ❖ Among the home owner ant baits, the peanut butter based baits including Hot Shot Max Attrax Ant Bait₂, Raid Ant Bait III, Raid Double Control Ant Baits II were most attractive to LFA.
- ❖ LFA were not attracted to any gel/liquid baits.
- ❖ Siesta & Extinguish Plus maintained higher residual attraction after exposure to rain and sunlight than Maxforce Complete or Pro bait.

Soaps and Detergents Against Little Fire Ants

- *Breaks surface tension of water and their oily cuticle.
- *Used for mosquito larvae control in vase water at graveyards.
- *Initial trials indicate that $\frac{1}{4}$ tsp dish washing detergent per gal of water for 15 min with agitation results in 100% mortality.

Before Dishing Detergent



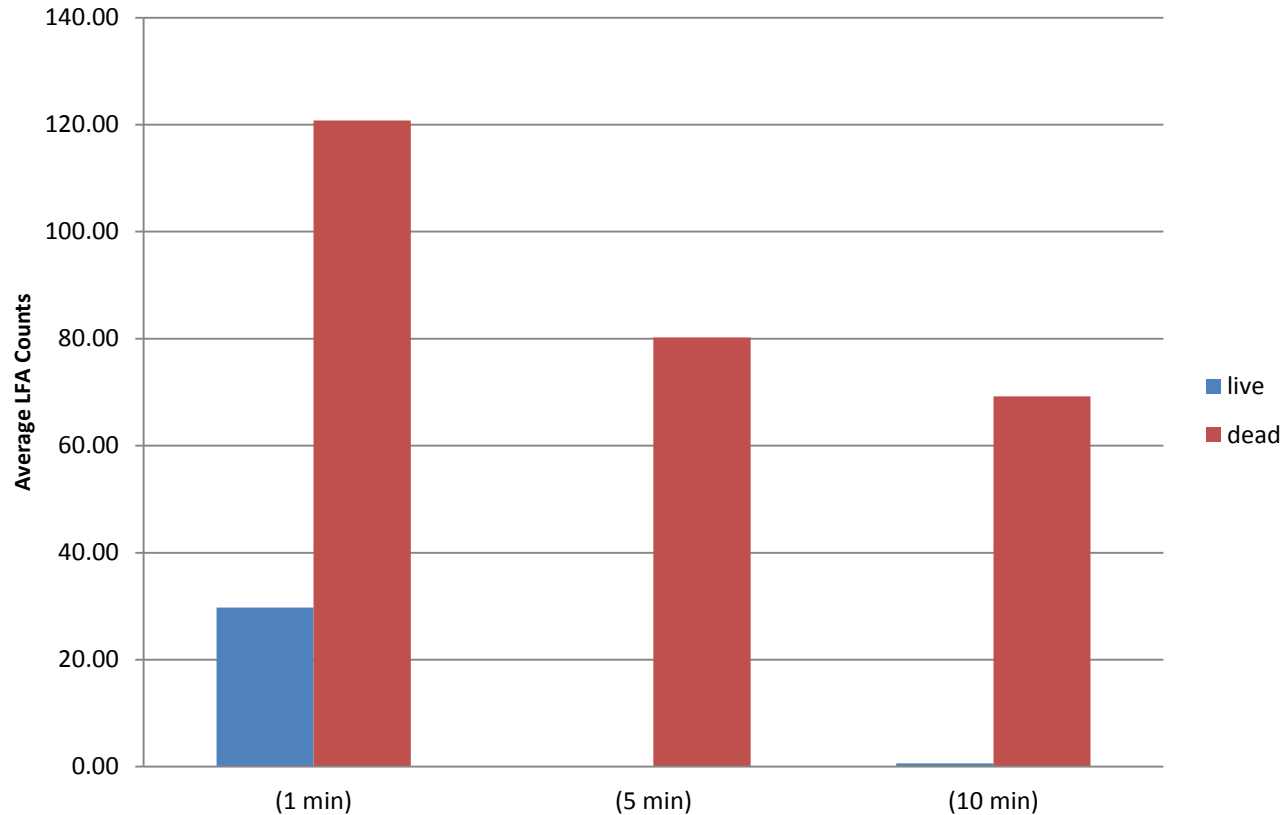
“Rafting and live LFA”

After Dishing Detergent



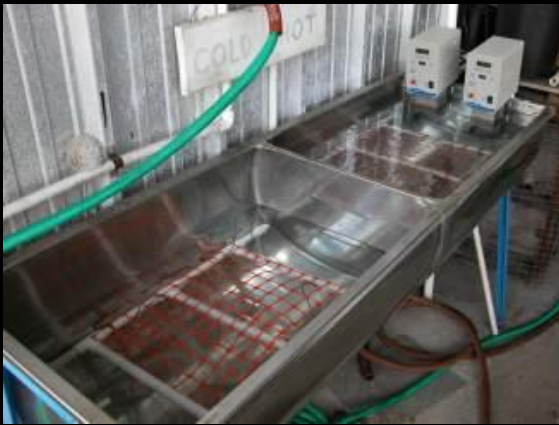
“LFA Drowns in water”

Soapy Water Dip Against LFA



	7 DAT			
	live	dead	total	% Mortality
(1 min)	29.75	120.75	153.00	78.9
(5 min)	0.00	80.20	80.20	100.0
(10 min)	0.60	69.20	69.80	99.1

*¼ teaspoon (1.25 ml. 0.033%)
of liquid dishwashing
detergent per gallon*



Hot Water Against Little Fire Ant



Hot water dip tank

Screened dish with with over 300 ants

- *Workers of LFA was effectively killed at 113 F for 10 min.
- *Test conducted at a nursery on potted palms drenched at 114 F for 11 min.
- *A tank-less gas water heater and pump provided the hot water drench.



Hot Water Drench Against Little Fire Ant

- *Effectiveness evaluated by peanut butter baiting on days 2, 5 & 9 and final pot removal and visual inspection on day 14.
- *Peanut butter baiting attracted no ants at 2, 5 and 9 days, while over 450 ants were attracted to the untreated plants.
- *Ant numbers in HW treatments were reduced by 99.3 and 89.3% in rhaps and fishtail, respectively.



DJI Phantom 2 Quadcopter

- **Amdro, Extinguish Plus* labels allow aerial equipment application.
- *FAA allows drones below 300 ft and one mile away from airports.
- *Commercial application for hire is regulated, but personal use is not.



\$869



Designed and built by Chiefy Gomes and Kyle Onuma

Aerial application of Amdro on string with peanut butter onto trees with drone.



AR.Drone 2.0 Parrot
\$299



Designed and built by Charles Nelson



THANK YOU!

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