RED IMPORTED FIRE ANT (RIFA)

Solenopsis invicta

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

Scott Stoddard, Farm Advisor, UC Cooperative Extension

DISTRIBUTION

- Red imported fire ant, “RIFA”
- *Solenopsis invicta*
- Order: Hymenoptera
- from South America; Argentina & Brazil
- 1930’s: Southern States and Puerto Rico
- Found in southern California in 1998
- Merced County Agriculture Commissioner began treating in 2002

UC Riverside, Center for Invasive Species Research

https://cisr.ucr.edu/red_imported_fire_ant.html

DISTRIBUTION

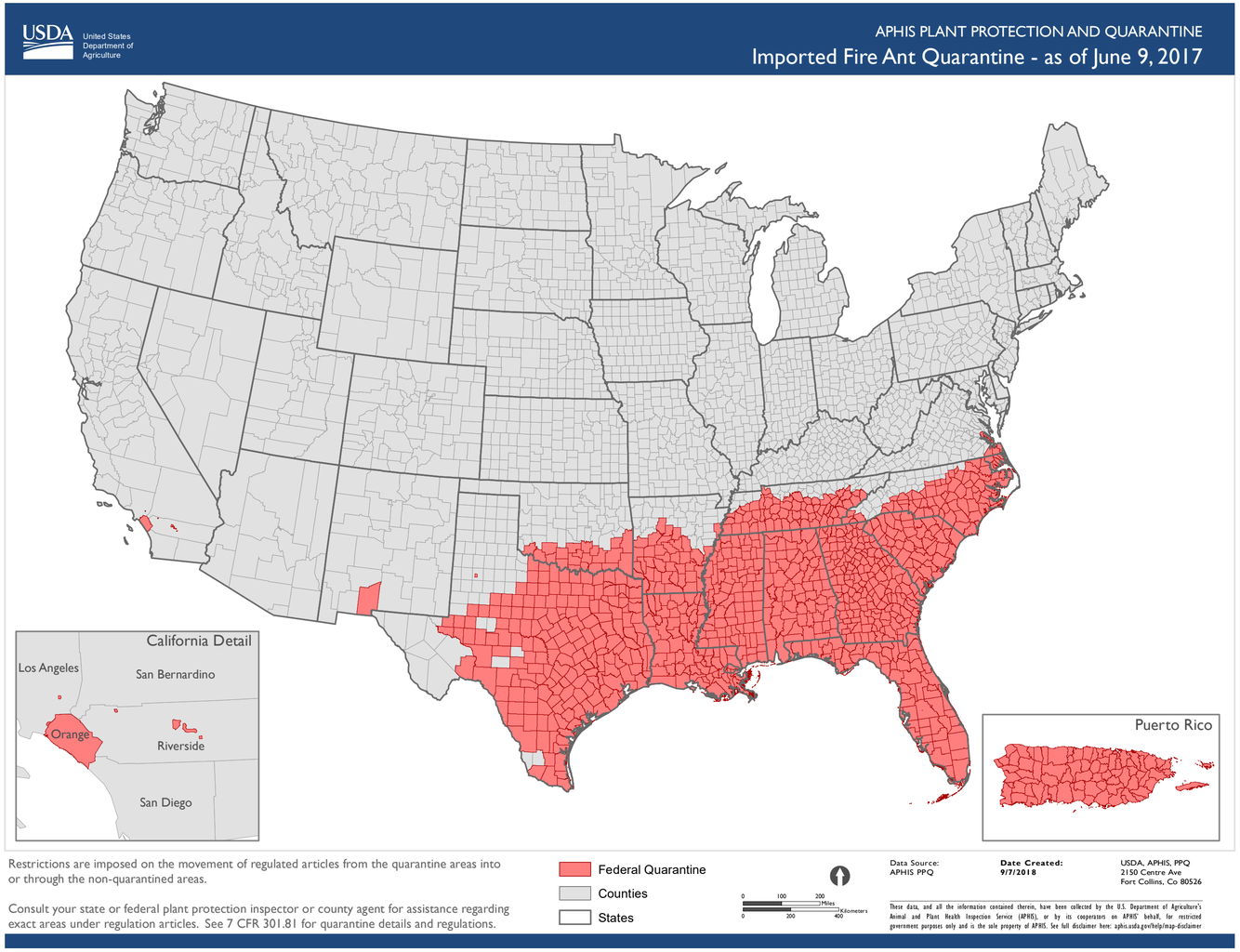


Figure 3. Red imported fire ant nest in an almond orchard. Mound measures approximately 1.5 ft in height. Photo by K. Tollerup.

News Release

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

Media Contact: Steve Lyle, Office of Public Affairs, (916) 654-0462, steve.lyle@cdfa.ca.gov

LARGEST RED IMPORTED FIRE ANT MOUNDS IN CALIFORNIAFOUND IN MERCED COUNTY

cdfa

Release #02-029

Print This Release

California Department of Food and Agriculture partners with local Ag Commissioner to eradicate pests

SACRAMENTO, May 30, 2002 – The California Department of Food and Agriculture (CDFA) and the Merced County Agricultural Commissioner have announced a partnership to stamp out one of the state's most dangerous insects, the Red Imported Fire Ant.

A Merced County farm currently being treated for the pest is the launch site for a public education program to provide residents and visitors with the information to identify and report infestations.

Merced County currently has more than 2400 heavily infested acres that include almond orchards, grape vineyards, berry fields, and pasture. The ant mounds found in this area are the largest ever seen in California.

Stanislaus County
Equal Rights Commission
1010 10th Street, Suite 6800, Modesto, CA 95354
P.O. Box 3404, Modesto, CA 95353-3404
Phone: 209.525.6333 Fax 209.544.6226

NEWS RELEASE

For Immediate Release
October 17, 2006

Contact: Milton O'Haire
209-525-4730

Red imported fire ant found in Stanislaus County near Turlock.

Stanislaus County – Stanislaus County Agricultural Commissioner Dennis Gudgel reported that an infestation of Red Imported Fire Ants (RIFA) have been discovered in a pasture one-half mile south of Turlock.

On October 11, 2006, Stanislaus County Agricultural Commissioner inspectors responded to a complaint from a person who was stung by ants while handling a bale of hay. RIFA was discovered on the property in a pasture and adjacent almond orchards. Ant samples collected were confirmed to be RIFA by the California Department of Food and Agriculture (CDFA) entomologist on October 16, 2006.

…it is likely that RIFA populations occur in other parts of the lower San Joaquin Valley but have gone undetected to this point.

K. Tollerup, 2018

DISTRIBUTION

- Considered to be one of the “worst invasive species in the world” [1].
- Can live in a variety of habitats: high humidity and rainfall, irrigated desert, urban areas, coastlands, golf courses, almond orchards….
- Prefer sunny, irrigated, sandy soils.
- Usually not high elevation, not in areas with cold winters (frozen snow)
- Can survive flooding by building rafts.

1. *http://www.iucngisd.org/gisd/speciesname/Solenopsis+invicta*

IMPORTANCE

- When disturbed, aggressively attacking in large numbers and can sting repeatedly.
- Stings burn then itch, develop a white pustule, can lead to secondary infections and scarring.
- Can be fatal to some (allergies).
- Will also sting pets; serious impact on wildlife (especially amphibians and reptiles, ground nesting birds).
- Mounds can damage mowing equipment.
- Damage outdoor electrical equipment.
- In Texas, >$1.1 billion spent on fire ant control (https://cisr.ucr.edu/invasive-species/red-imported-fire-ant)

Irritate harvest crews (e.g. peaches); negative impact on other ant species; direct crop losses (10% in almonds).

RIFA infests lawns on parks, cemeteries, schools, houses, farms, etc. RIFA bites and stings people and its venom may cause anaphylactic shock in susceptible individuals. In Merced County: most schools and parks in Atwater and Livingston, also Merced College.

APPEARANCE

Red Imported Fire Ant mound

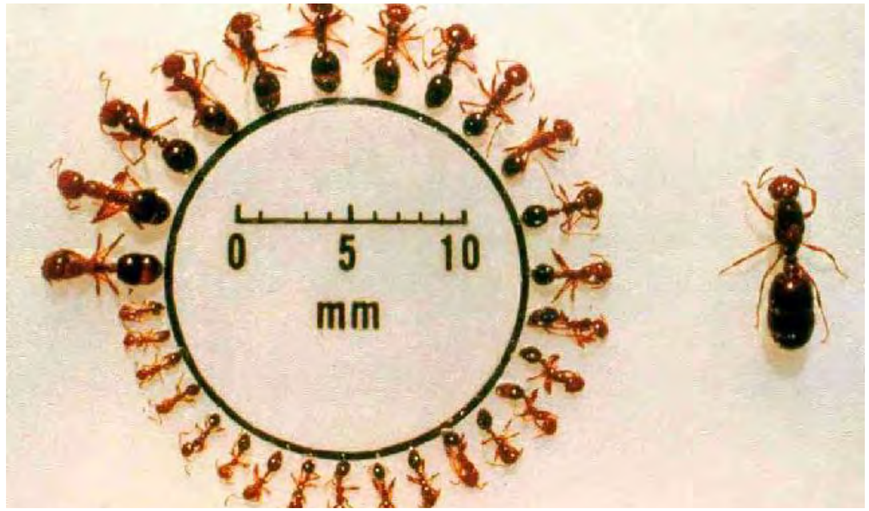
Southern fire ant, *Solenopsis xyloni*

(California native)

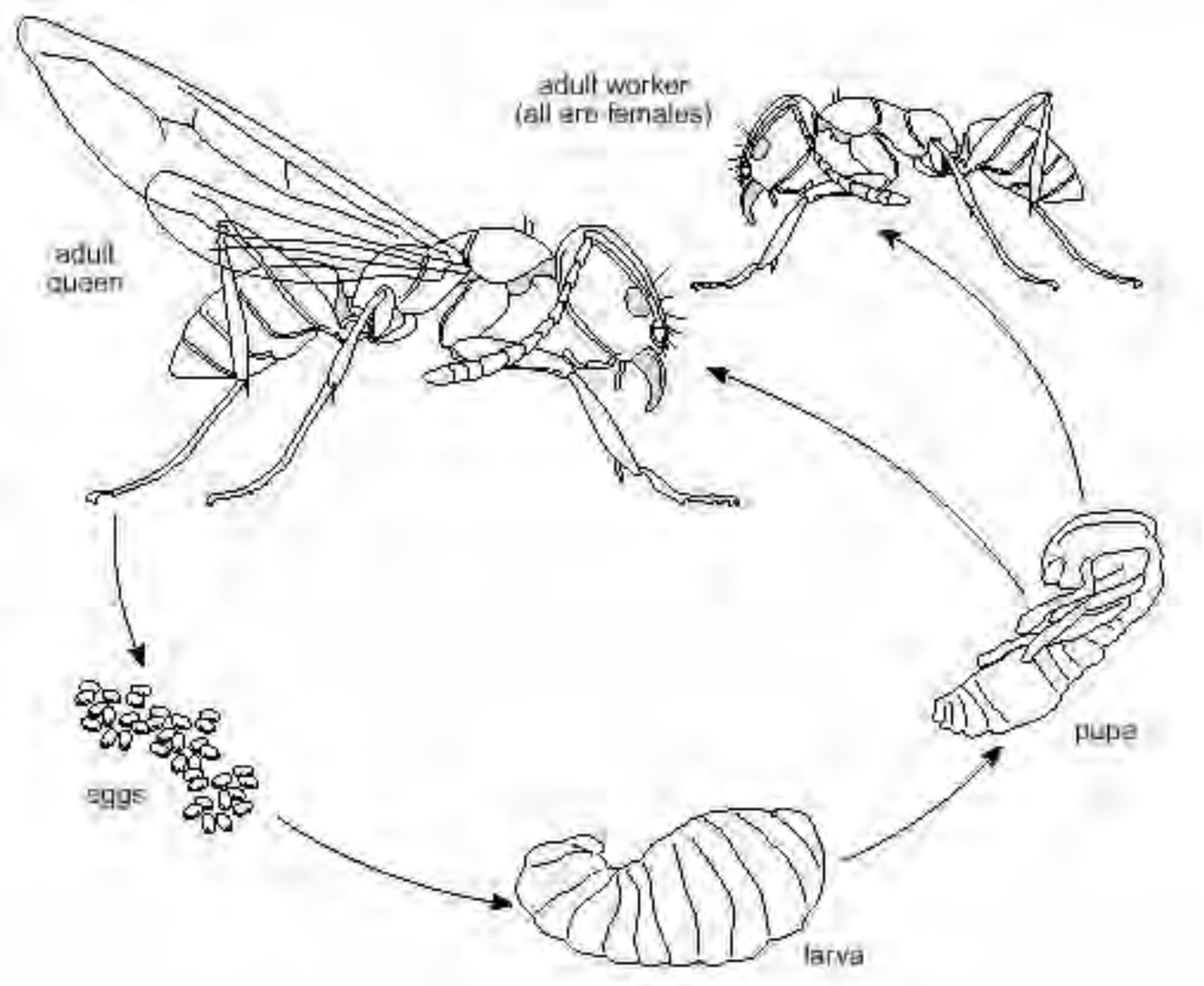
MOUNDS

Sidewalk mound and small mound in turf. Large turf mounds are sometimes mistaken for pocket gopher activity.

photo credit: Siravish Teravati, UCCE Los Angeles



Appearance: reddish-black, top of abdomen is dark brown/black, 1/16 to 1/5” long



LIFE CYCLE

- complete metamorphosis
- 4 instar larvae, white pupae
- Most: sterile wingless female worker ants
- Select few: receive extra food, become larger w/wings (queens and males)
- Mating flights mostly in the spring, but can occur anytime.
- monogyne (1 queen) and polygyne (multiple queens) colonies
- Queens may live > 7 years.
- Average colony size is 27,000, may > 200,000 workers

http://www.cdfa.ca.gov/Plant/pdep/target_pest_disease_profiles/rifa_profile.html

Larvae, workers, queen, and eggs.

Warning Pesticide Treated Area!

This area is to be treated for Red Imported Fire Ants on

Intended Date _____

With Extinguish Plus®
Manufactured by Wellmark International
EPA Reg No 2724-496

All lawn areas and planter beds are to be treated to control

RED IMPORTED FIRE ANTS

School pesticide use posting is the responsibility of the
"school district designee"

MANAGEMENT

- Keep them off your property.
- Fire ant baits.
  - insecticides
  - insecticide + IGR
- Biological control
  - parasitic phorid flies
  - Solenopsis invicta virus-5 (SINV-5)
  - parasitic fungus
  - Argentine ants

INSECTICIDES

- Granular baits are the preferred choice.
- Some baits contain an insecticide to kill queen and workers.
- Others contain an insect growth regulator (IGR) that prevents normal colony development.
  - tend to work slowly
- 9 registered active ingredients
- Granular baits using synthetic pyrethroids are **not recommended.**
  - **these are actually granular contact insecticides and not specific fire ant baits**

BAITS VS. GRANULES

a.i.: gamma cyhalothrin

Many non-bait insecticides, including many that are used against fire ants, come in the form of granules. Some baits are actually labeled as “bait granules.” It is very important to know the differences between a bait and a contact insecticide granule and how to use each of them.

Effect of moisture: Baits should never be watered in. Water ruins bait particles. Granular insecticides usually work faster and better when watered into the soil surface.

Granular contact insecticides and baits appear somewhat similar, but their use and how they work are very different.

COMMON FIRE AND BAIT INSECTICIDES FOR CALIFORNIA

Active Ingredients (a.i.)	Product Name	Activity	Availability	Speed of Control
Hydramethylnon	Amdro Pro Fire Ant Bait	affect digestive system	Professional Use Only	Moderate to slow
	Amdro Fire Ant Bait		Homeowners	Moderate to slow
Abamectin	Ascend, Award II, Clinch	affect nervous system	Professional Use Only	Moderate to slow
Fipronil	Maxforce FC, Top Choice	affect nervous system	Professional Use Only	Moderate to slow
Pyriproxyfen	Distance, Esteem	IGR	Professional Use Only	Slow
Spinosad	Conserve	affect nervous system	Professional Use Only	Moderate to slow
Methoprene	Extinguish	IGR	Professional Use Only	Slow
Methoprene + hydramethylnon	Extinguish Plus	IGR + slow insecticide	Professional and homeowner use	Moderate to slow
metaflumizone	Siesta	affect nervous system	Professional Use Only	Moderate to slow
Indoxacarb	DuPont Advion Fire Ant Bait	affect nervous system	Professional Use Only	Moderate to fast
	Spectracide Fire Ant Killer Plus Preventer Bait Once and Done!		Homeowners	Moderate to fast

BAIT APPLICATION TIPS

- Ants must be actively foraging.
  - Check for activity by placing a corn chip/piece of hot dog/Spam and check after 30 minutes.
- Temperature: between 60° F - 100° F.
- Use fresh bait. The soybean oil used in baits turns rancid after a few months, which deters feeding.
- Keep the bait dry
  - Do not apply if there is heavy dew (early morning).
  - Do not irrigate for 24 hours after application.
  - Do not apply before rainfall or irrigation.
- Broadcast rather than mound apply

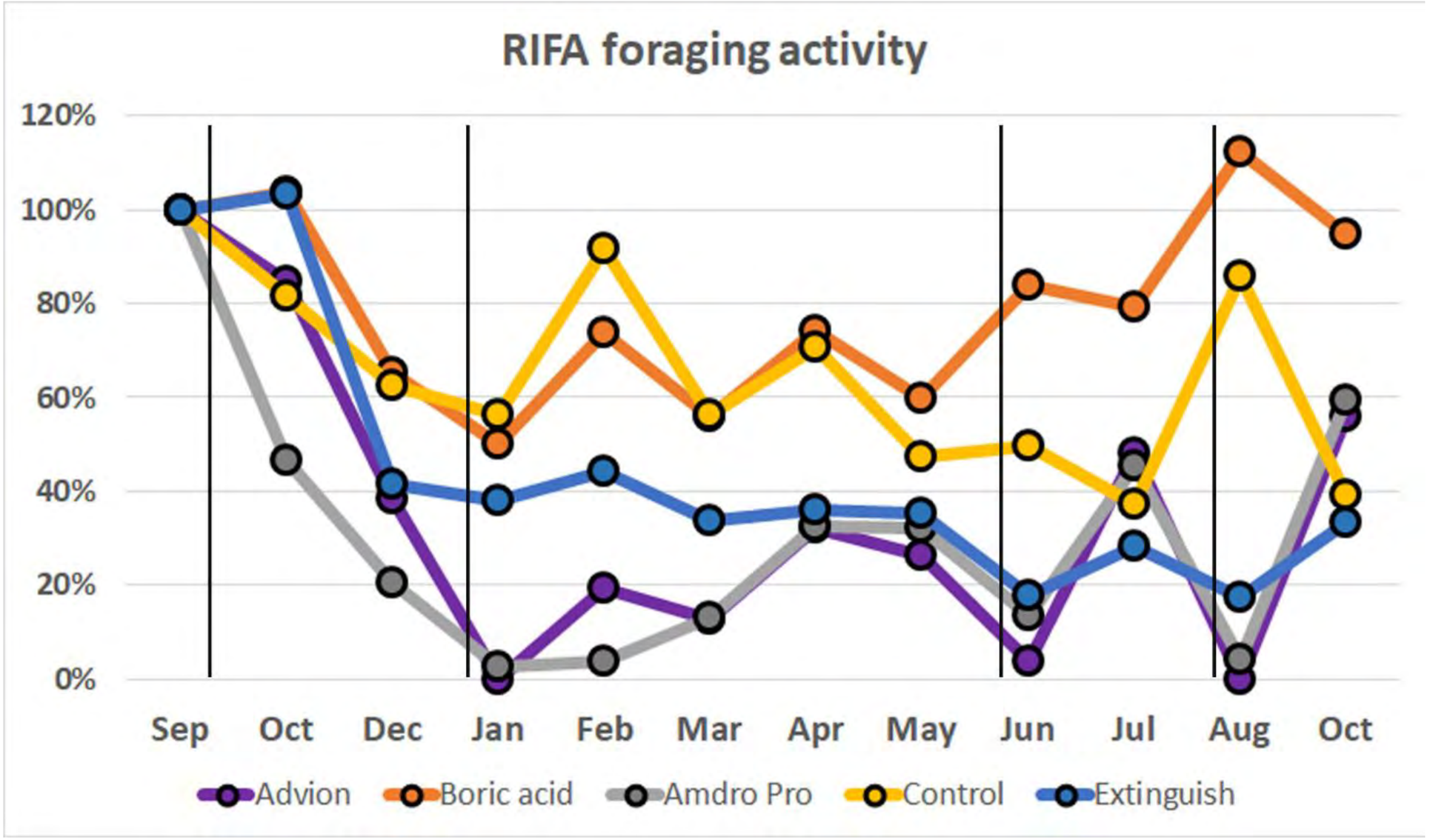
HOW BAITS WORK

- Soybean oil + corn grit + a.i.
  - the oil serves as both the attractant and the carrier for the active ingredient.
  - soybean oil is not attractive to many other pest ant species in and around the home, particularly to sugar-feeding ants.
- Fire ant workers quickly pick up the bait, moving the active ingredient into the fire ant colony and away from other organisms.
- The ants extract the toxicant-laden oil and feed it to other members of the colony.
- Baits are the most effective method to keep the queen from reproducing.

RESEARCH RESULTS

- *Siavash Teravati, UCCE Los Angeles*
- Riverside County, 2 sites
- 7 reps
- Treatments
    1. Advion (1.5 lb/acre) - Indoxacarb
    2. Amdro Pro (1.5 lb/acre) - Hydramethylnon
    3. BorActin (1%) – 25% sucrose solution – Orthoboric acid
    4. Extinguish (1.5 lb/acre) – S-methoprene
    5. untreated control

TARAVATI, UCCE LA, RIFA CONTROL TRIAL



RESULTS

- 50% mound reduction in a few months
- 90 - 95% RIFA reduction after 1 year.
- Advion: CAUTION. Amdro Pro: CAUTION. Extinguish. CAUTION

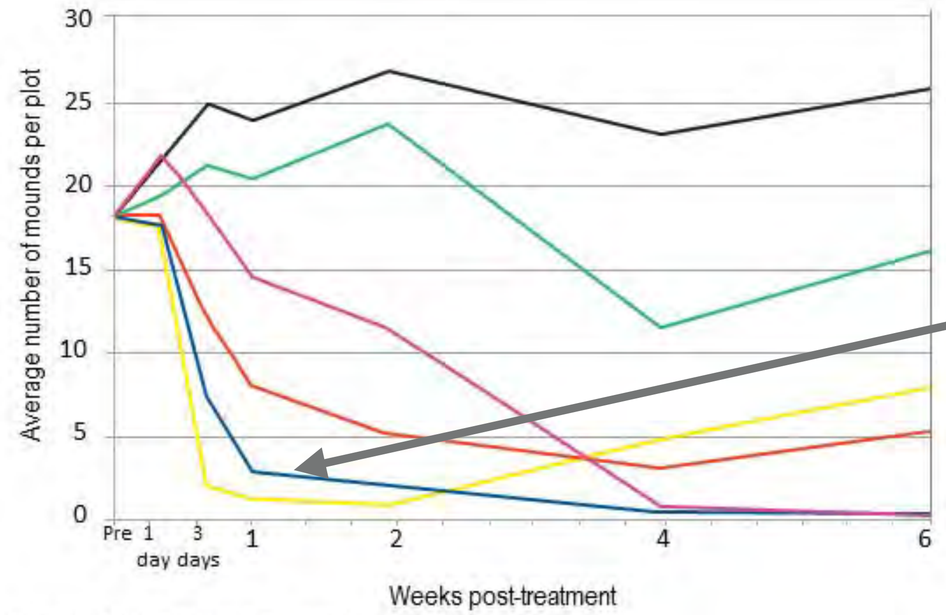


Figure 1. Fall treatment test through 6 weeks.

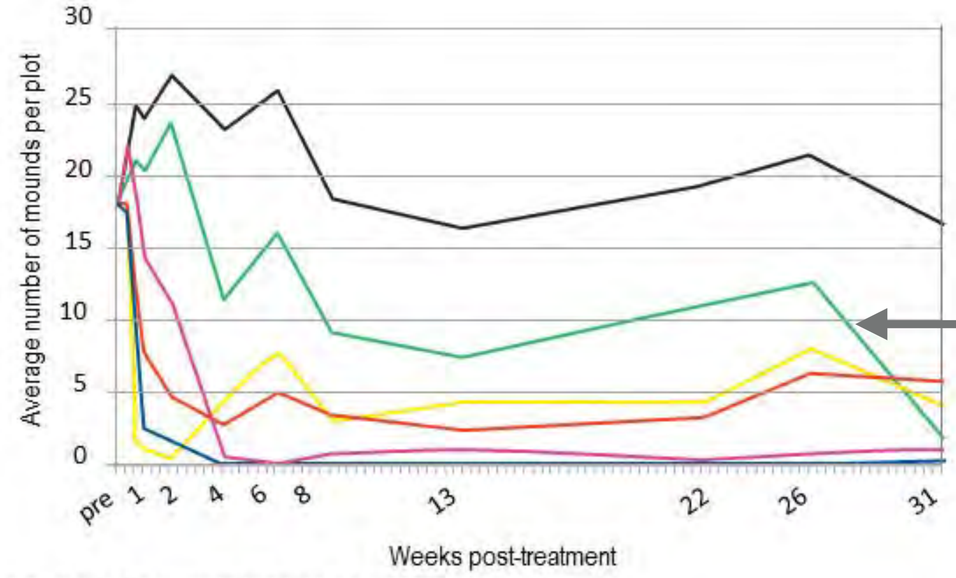


Figure 2. Fall treatment test through 7 months.

Both bifenthrin and indoxacarb had quick knockdown

Treatments:

Black: Untreated control

Yellow: Advion (indoxacarb)

Red: Amdro Fire Ant Bait (hydromethylnon)

Blue: Talstar (bifenthrin)

Purple: Top Choice (fipronil)

Green: Extinguish (methoprene)

methoprene slowly reduced the number of mounds

Texas A&M AgriLife Extension Service
Paul R. Nester, Extension Program Specialist,
Robert T. Puckett, Assistant Professor and Extension Entomologist
https://ant-pests.extension.org/broadcast-baits-for-fire-ant-control/

WHY AREN'T THE SCHOOLS DOING ANYTHING??

CA Healthy Schools Act

ACTION PLAN FOR ANTS

WHEN TO TAKE ACTION	NONPESTICIDE PRACTICES	LEAST HARMFUL PESTICIDE	LAST RESORT
▶ If you see a few ants inside, there are likely to be more soon.	▶ Clean up ants using a sponge or paper towel with soapy water. ▶ Fill any ant entryways with caulk or petroleum jelly. ▶ Remove infested potted plants. ▶ Clean up food sources. ▶ Eliminate leaks or water sources.	▶ Rely on baits, a non-spray pesticide, to manage the ants.	▶ If you hire a PMP, insist that they use baits rather than perimeter treatments or monthly sprays.

When should you hire a pest management professional (PMP)?

If ants continue to plague you indoors, work with a PMP who practices IPM to create a management plan. Pesticides should only be used as a last resort.

Source: apps.cdpr.ca.gov/schoolipm/. Oct 2019

CA DPR: IPM FOR ANTS

- Focus on Argentine ant
- Assumes the ant problem is indoors (structural ant control problem)
  - sanitation
  - exclusion
  - perimeter sprays as a last resort

"Pesticides should only be used as a last resort."

THE HEALTHY SCHOOLS ACT

EVERY CHILD DESERVES A HEALTHY SCHOOLSITE

California School & Child Care IPM

WHAT IS THE HEALTHY SCHOOLS ACT ?

When pesticides are used at schools and child care centers in California, the Healthy Schools Act defines requirements for school and child care center staff, pest management professionals, and the Department of Pesticide Regulation. The California Legislature originally passed the law in 2000. The Healthy Schools Act also encourages schools and child care centers—collectively referred to as schoolsites—to adopt effective, low-risk pest management practices, also known as integrated pest management or IPM.

WHAT IS IPM ?

Integrated pest management, or IPM, focuses on effective, low-risk pest management practices. IPM is a big picture approach to pest management that considers people and the environment when pest management decisions are made. There are a variety of IPM practices, including cleaning regularly, closing gaps into buildings, fixing leaky pipes, setting traps, and choosing low-risk pesticides. With the amount of IPM information available today and an enthusiastic IPM leader, all schoolsites can successfully manage pests!

WHAT IS A PESTICIDE ?

A pesticide is any substance intended to prevent, destroy, repel, or mitigate any pest. Pests include insects, rodents, weeds, and germs. Insecticides, rodenticides, herbicides, sanitizers, and disinfectants are all pesticides.

WHAT ARE THE HEALTHY SCHOOLS ACT REQUIREMENTS ?

IDENTIFY

Choose an IPM coordinator who will make sure the requirements of the HSA are met.

TRAIN

Provide annual Healthy Schools Act training to all teachers, staff, and volunteers who use any pesticides, including exempt pesticides.

NOTIFY

Send an annual notification to all parents, guardians, and staff of all pesticides expected to be applied during the year.

REGISTER

Give parents, guardians, and staff the opportunity to register to be notified 72 hours in advance of individual pesticide applications.

PLAN

Create a plan for IPM and publish it on the school, district, or child care center website. If a website does not exist, include the plan in the annual written notification.

POST

Post warning signs in the area where a pesticide will be applied, at least 24 hours before and 72 hours after the application.

RECORD

Keep records of pesticide applications, and file these records for at least 4 years.

REPORT

Submit annual pesticide use reports to DPR by January 30 for the previous year's applications. Only report pesticide use by school personnel.

dpr Department of Pesticide Regulation

www.cdpr.ca.gov

[SCCIPM 09 (6/2019]

The Healthy Schools Act (HSA)

encourages ECE centers to use IPM and requires centers to:

1. notify parents of pesticide use.
2. maintain registry of parents and staff.
3. post warning signs.
4. keep written records of pesticide use.
5. designate an IPM coordinator.

HSA also requires the Department of Pesticide Regulation to collect information on pesticide use in child care centers.

MISCONCEPTION: DPR WON'T ALLOW SCHOOLS TO CONTROL RIFA

- Fire ant baits are allowed
- Properly timed, applications can occur in the summer months when school is not in session
- Fire ant baits are effective, safe, and economical
- Baits are used to control ants in the schoolyard/playground areas

Updated April 1, 2020

Pesticide Products Prohibited From Use in
California Schools and Child Care Facilities
Pursuant to Assembly Bill 405 (Montanez) – Chapter 566, Statutes of 2005

The following pesticide products meet the criteria of Education Code 17610.1(a), and therefore, are prohibited from use on schoolsites. Also prohibited are all pesticide products that are canceled or suspended by the California Department of Pesticide Regulation, or are under phaseout of use. To check the registration status of a product, search DPR's Product/Label Database: https://www.cdpr.ca.gov/docs/label/labelque.htm

Product Brand Name	EPA Registration Number
Amplitude	84059-28-ZA
Amplitude ST	84059-28-ZB
Astun	71512-23-AA-59807
Atrakta Mosquito Lure	87472-1-AA-87837
BG-Sweetscent	87472-1-AA
Contrapest	91601-1-AA
DuPont Benevia Insect Control	352-857-AA
DuPont Exirel Insect Control	352-859-AA
DuPont Verimark Insect Control	352-860-AA
Employ	71771-3-AA
Ennobel Biofumigant	84059-26-AA
Ference	100-1551-AA
Isofetamid 400SC Fungicide	71512-22-AA
Isofetamid Turf Fungicide	71513-23-AA
Kabuto Fungicide SC	71512-23-AA-2217
Kenja 400SC Fungicide	71512-22-AA-88783
Mainspring	100-1552-AA
Onebait Universal Mosquito Trap Attractant	87472-1-AA-74939
Rhyme Fungicide	67760-120-AA
Rhyme Fungicide	279-3588-AA
Starbar Cyanarox Insecticidal Bait	100-1541-AA-89459
Stargus	84059-28-AA
Topguard Fungicide	67760-75-AA
Zyrox Fly Granular Bait	100-1541-AA

MANAGEMENT: TURFGRASS

Although red imported fire ants are not present in all areas of California, they are a serious pest and are subject to quarantine regulations. In Southern California, state and federal officials have placed Orange County and portions of Los Angeles County and Riverside County under quarantine that limits the movement of articles including plants and soil. The California Department of Food and Agriculture (CDFA) has established the Red Imported Fire Ant hotline (1-888-4FIREANT or 1-888-434-7326) to report any suspected occurrence of red imported fire ant in California.

Treatment

Bait products are available for controlling red imported fire ants in areas where they are established. See the Fire Ant Pest Notes for more information. Contact CDFA or your county Agricultural Commissioner's office for information on approved treatments.

MANAGEMENT: SCHOOL GROUNDS, PARKS, ETC.

- Use IGR products (Amdro Pro, Extinguish, Extinguish Plus, Esteem)
- Make 2 applications per year at label rates
  - July and August
- Do not irrigate for 24 before or 48 hours after application
- Gardens, raised beds, potting containers, fence rows, baseball diamonds, parking lot edges, and ROW should also be treated
- Healthy soils paperwork

BIOLOGICAL CONTROL

Parasitic phorid flies (Order Diptera, genus Pseudacteon) from South America. Several species lay eggs in the thorax, larvae develop in head of ant and cause it to fall off.

Kira Metz, USDA APHIS PPQ, Bugwood.org

References:

UC IPM. http://ipm.ucanr.edu/PMG/PESTNOTES/pn7487.html

https://cisr.ucr.edu/red_imported_fire_ant.html

https://www.desertmuseum.org/invaders/invaders_fireant.php

Pedigo, L. and M. Rice. 2009. Box 6.2 Imported fire ants. p.215. *In* Entomology and Pest Management, 6th ed. Pearson - Prentice Hall, publisher.

Tollerup, K. 2019. UCCE San Joaquin Valley Trees and Vines blog. https://www.sjvtandv.com/blog/red-imported-fire-ants-in-merced-and-stanislaus-county-almond-orchards.

Broadcast baits for fire ant control. Southern Region IPM Center. https://ant-pests.extension.org/broadcast-baits-for-fire-ant-control/

CDFA. Plant Health - Red Imported Fire Ant Pest Profile. http://www.cdfa.ca.gov/Plant/pdep/target_pest_disease_profiles/rifa_profile.html

Questions?

Scott Stoddard

csstoddard@ucanr.edu

UC CE | UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources | Cooperative Extension