

## Fire ant management on sports and athletic fields

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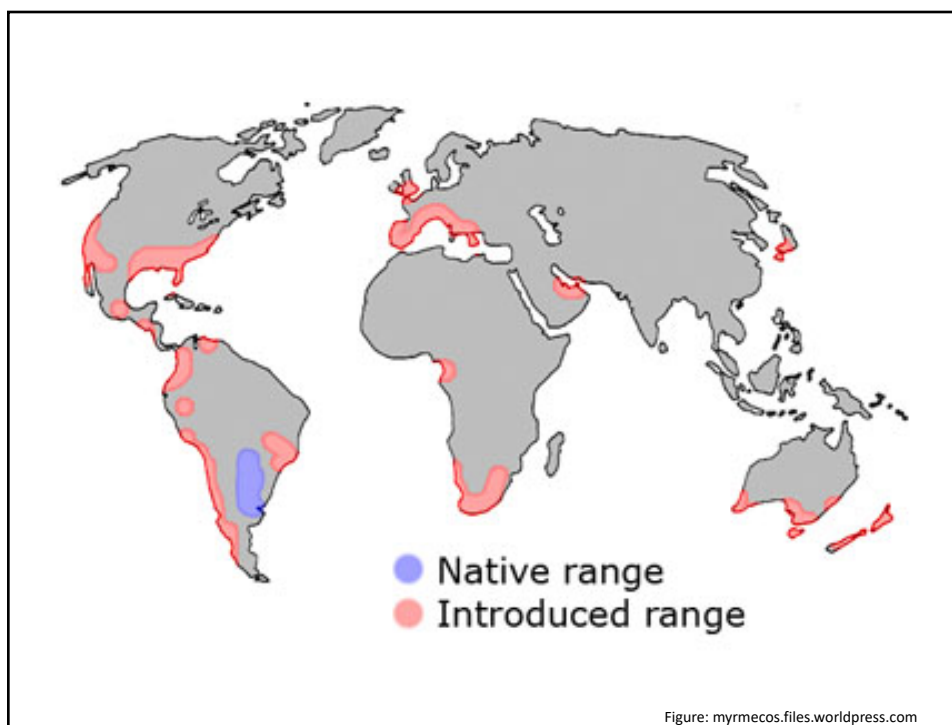
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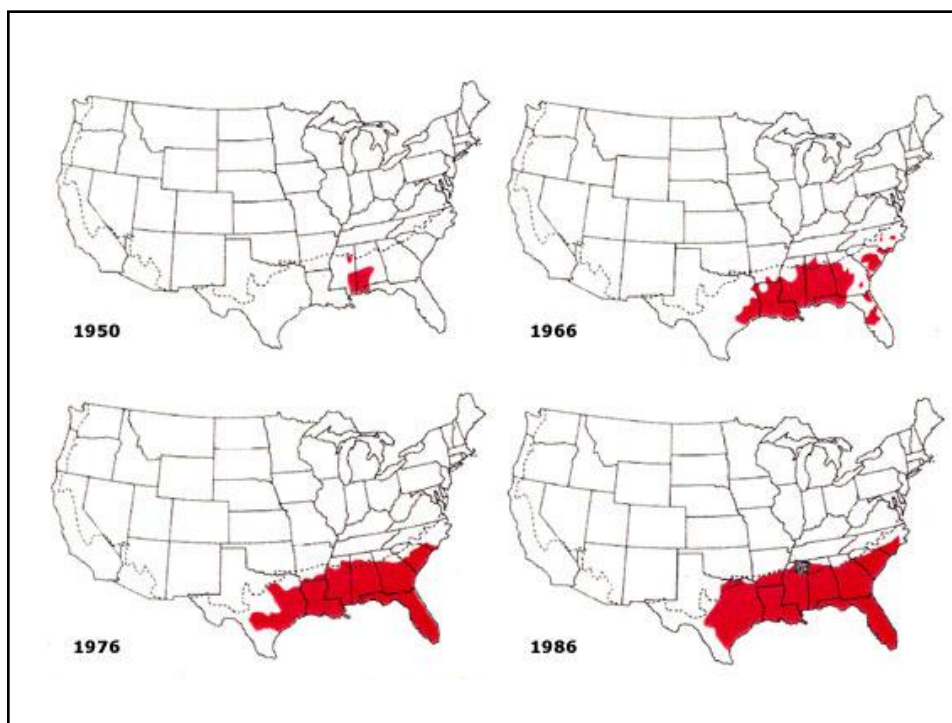
Realistically, no one can get rid of all fire ant mounds.  
So, we need to know how many is “unacceptable”.  
‘Threshold’ also changes depending on location.



2

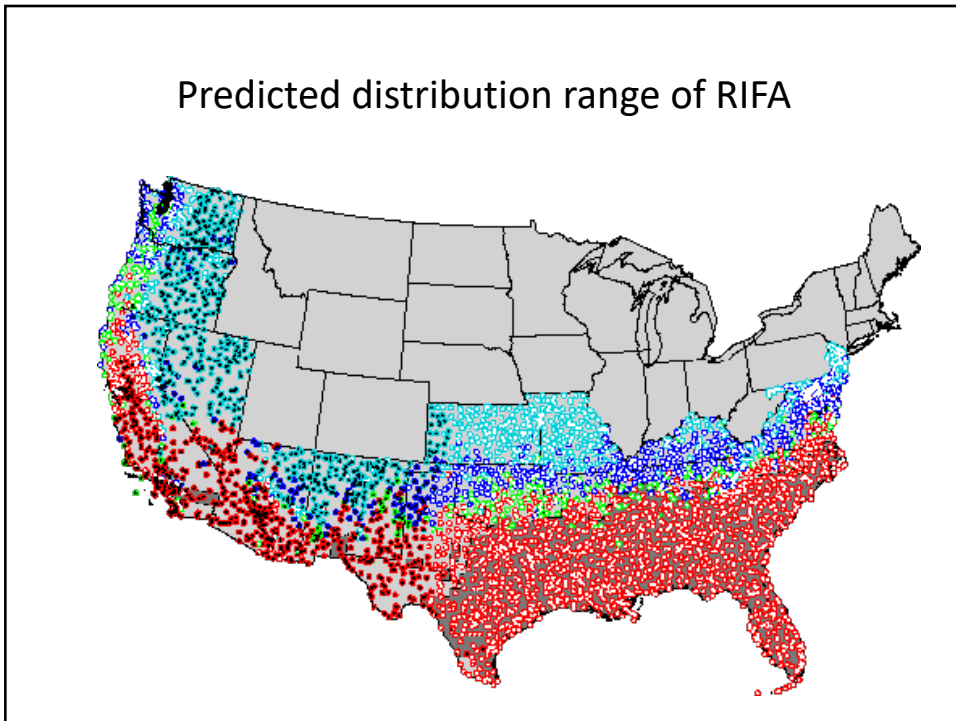


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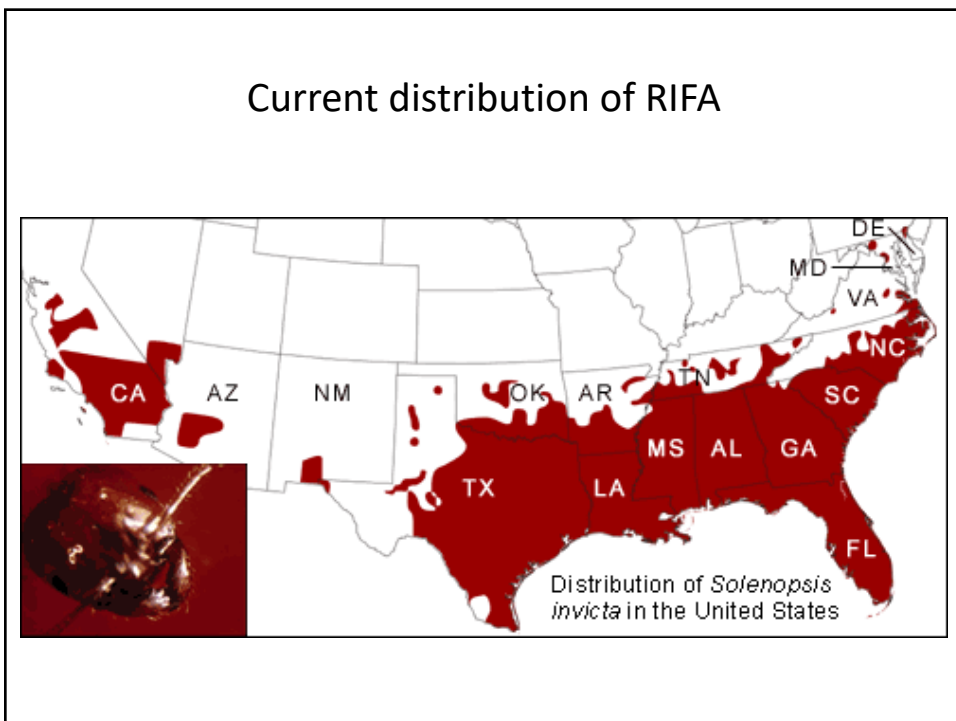
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Predicted distribution range of RIFA



5

Current distribution of RIFA



6

### Not to confuse these with RIFA...

- Field ants or meadow ants, *Lasius* spp.
  - Mounds on greens can be a pest issue.
  - Small, low mounds with a single opening.



7

### Not to confuse these with RIFA...

- Tropical fire ant, *Solenopsis geminata* (introduced).
- Southern fire ant, *Solenopsis xyloni* (native).
  - Mounds often on open, sandy areas.
  - Large, low mounds with a multiple obvious openings.



8



### Not to confuse these with RIFA...

- Pyramid ant, *Dorymyrmex bureni*.
  - Mounds often on open, thinly grassed areas.
  - Moderate, high mounds with a single opening.



9



10



11

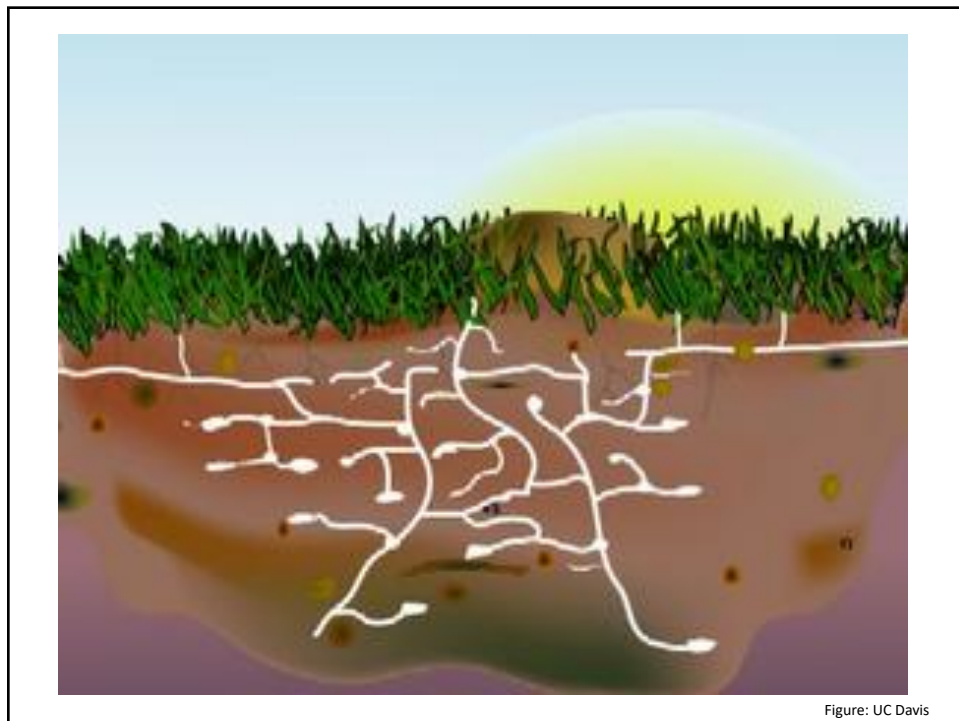


Figure: UC Davis

12

## Biology of RIFA

- Social insect with highly organized caste structure.
- Brood: the eggs and immatures
  - The development from egg to adult is about 25 days.



13

## Biology of RIFA

- Adults: Division of labor through the caste system
  - Queen: Wingless, mated female, the sole purpose is to reproduce.
  - 1 queen (monogyne) or multiple queen (polygyne) in each colony.
  - Live for about 7 years and produce about 1600 eggs per day.



14

## Biology of RIFA

- Adults: Division of labor through the caste system
  - Workers: Sterile females of varying sizes.
  - The division of labor is based on age, with the youngest care for broods, the middle-aged maintain and protect colony, and the oldest forage for food.
  - Live about 5 weeks.



15

## Biology of RIFA

- Adults: Division of labor through the caste system
  - Reproductives: Winged females and males (alates).
  - Flight often occur 1-2 days after rain and temperature is above 72°F.
  - Mate in mid-air.
  - Males die soon after mating.
  - Females lose the wings and initiate new colonies.



16



## Fire ant treatment methods: Insecticides

- 2 general groups of insecticides:
  - 1) Baits
    - Often are insect growth regulators and toxicants.
    - Only works when ants ingest the products.
    - Formulated with soybean oil and corn grit to lure RIFA.
    - Used as spot treatment, bait station or granular broadcast.
  - 2) Broadcast Insecticides
    - Works when ants contact the active ingredients directly.
    - Used as sprays or granular broadcast.

17

## RIFA treatment programs

- Often, the RIFA treatment program falls within 3 general categories:
  - 1) Individual mound treatment
  - 2) Broad-cast application
  - 3) The 'two-step' program
    - Step 1: Broadcast baits
    - Step 2: Individual mound treatment



18



## Individual mound treatment

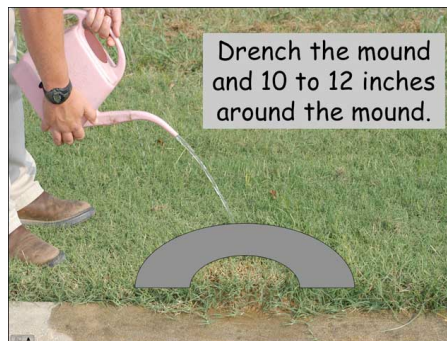
- For: Small area with small number of mounds (less than 30 mounds per acre).
- Approach: Applied contact insecticides as dust, dry granules, drenched dry granules, liquid drench, or aerosol.
- Shortcomings: Not for larger areas; more labor and time; mound will move; area can be re-invaded.



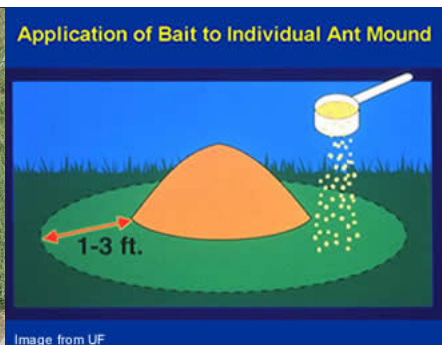
19

## Individual mound treatment

- For: Small area with small number of mounds (less than 30 mounds per acre).
- Approach: Applied contact insecticides as dust, dry granules, drenched dry granules, liquid drench, or aerosol.



When drenching a mound start by using about ¼ of the total volume to treat a 10 to 12 inch band around the outside of the mound. Then pour the rest of the drench directly on the mound.



20

## Individual mound treatment

- Shortcomings: Not for larger areas; more labor and time; mound will move; area can be re-invaded.



21

## Broadcast baits or long residual contact insecticides

- For: Larger areas with more mounds; reduces re-invasion.
- Approach: Broadcast long residual contact insecticides (e.g., fipronil and pyrethroids) with hand-held or mechanical spreaders.
- Shortcomings: Expensive; use more insecticides, harmful to non-target ant species; takes longer to notice reduction.



22

## ‘Two-step’ program

- For: Large or medium-sized areas at moderate cost.
- Approach: 1. Broadcast a bait in the spring and/or fall;  
2. Treat nuisance mounds individually with fast-acting contact insecticides.
- Shortcoming: May harm non-target ants; take a long time to notice effect.



23

## Baits for RIFA in sports fields

- Some commonly used baits:

Type	Active ingredient	Selected brand names
Stomach poison	abamectin	Ascend, Award II
	hydramethylnon	Amdro Pro, Maxforce Complete
	indoxacarb	Advion
	metaflumizone	Siesta
	spinosad	Antixx, Conserve Bait
Growth regulator	pyriproxyfen	Distance bait
	s-methoprene	Extinguish Professional
Combination	hydramethylnon + s-methoprene	Extinguish Plus

24

## Pros and Cons of bait types

### Toxicants (stomach poisons)

- abamectin, hydramethylnon, indoxacarb, metaflumizone, spinosad
- Faster acting; may see results within 2-6 weeks.
- Shorter residual control; 3-4 months; reapplication may be needed.

### Insect growth regulators

- methoprene, pyriproxyfen
- Slower acting; may need more than 3 months to show results.
- Long residual control; disrupt colony reproduction and may provide year-long suppression of fire ant activity.

Combination products (e.g., Extinguish Plus) may have benefits of both.

25

## Tips for using baits against RIFA

- Use fresh baits; store baits in cool, dry place.
- Apply when ants are foraging, i.e., when soil temperature is between 70 and 90°F. Use the “hotdog” or “Cheetos” test.
- Soil surface should be dry and no rain is forecast within 24 hours.
- Apply in late afternoon or evening.
- Complete or thorough coverage may not be needed; ants will find and bring baits home.
- Good for hard-to-reach and sensitive areas, e.g., side-walks, near ponds, etc.

26

## Insecticides for RIFA in sports fields

### Some commonly used insecticides:

Chemical class	Active ingredient	Selected brand names
Organophosphates	acephate	Acephate, Orthene, etc.
Organophosphate + Neonicotinoid	acephate + imidacloprid	Avatar PLX
Fipronil	fipronil	TopChoice
Fipronil + Pyrethroid	fipronil + bifenthrin + lambda-cyhalothrin	Taurus Trio
Pyrethroids	beta-cyfluthrin	Tempo SC Ultra
	bifenthrin	Bifen, Crosscheck, Broadside, UP-Star, OnyxPro, Talstar, etc.
	lambda-cyhalothrin	Demand, Scimitar, Lambda, etc.
	permethrin	Astro
	zeta-cypermethrin + bifenthrin	Talstar XTRA

27

## Insecticides for RIFA in sports fields

### Some commonly used insecticides:

Chemical class	Active ingredient	Selected brand names
Neonicotinoids	clothianidin	Arena 0.25G
	thiamethoxam	Meridian 25WG
Neonicotinoid + Pyrethroid	clothianidin + bifenthrin	Aloft
	thiamethoxam + lambda-cyhalothrin	Tandem
	zeta-cypermethrin + bifenthrin + imidacloprid	Triple Crown
Neonicotinoid + Pyriproxyfen	clothianidin + pyriproxyfen	Sumari
Spinosyns	spinosad	Conserve SC, Entrust

28



## Baits or Insecticides?

### Baits

- Can be used for mound treatment or broadcast.
- Granular.
- Must be applied when ants are foraging and environmental conditions more suitable.
- Thorough coverage is not necessary.
- Suitable for hard-to-reach places and sensitive areas.
- Shorter shelf life.

### Insecticides

- Can be used for mound treatment or broadcast.
- Granular, spray or incorporated.
- Best applied when rain is forecasted, or irrigation is scheduled; ants can be absent.
- Critical to achieve thorough coverage.
- More suitable for open areas; observe buffer zones.
- Longer shelf life.

29

## Is there a perfect RIFA management program?

- Not really... depends on
  - Threshold, or tolerance level.
    - High use areas – low tolerance.
    - Medium use areas – low to moderate tolerance.
    - Low use areas – high tolerance.
  - Product available.
    - Speed of activity.
    - Residual longevity.
    - Ease of application.
  - Location.
    - Related to tolerance level (see above).

30

### For high use areas... e.g., around buildings

- Need complete elimination of fire ant colonies.
  - Form a band of high protection, yearly.
    - Contact insecticides – fipronil
  - Apply a quick knock-down product to eliminate breakthrough.
    - Contact insecticides – pyrethroid (bifenthrin, cyhalothrin, etc.)
    - Fast-acting baits – abamectin, indoxacarb, metaflumizone
  - Will be expensive.

31

### For high use areas... e.g., fields and stands

- Need complete elimination of fire ant colonies.
  - Form a band of high protection, yearly.
    - Contact insecticides – fipronil
  - Apply a quick knock-down product.
    - Contact insecticides – pyrethroid (bifenthrin, cyhalothrin, etc.)
  - Follow with periodical broadcast application of long-residual contact insecticides.
    - Contact insecticides – pyrethroids
  - Will be expensive.

32

For areas with low to moderate tolerance levels  
... e.g., out-fields, stands

- Fewer mounds, the merrier.
- Two-step method is sufficient for this situation.
  - Apply a quick knock-down product.
    - Fast-acting baits – abamectin, indoxacarb, metaflumizone
  - Follow with periodical broadcast application of long-residual contact insecticides.
    - Contact insecticides – pyrethroids
  - Will be expensive.

33

For areas with moderate to high tolerance levels  
... e.g., parking lots, landscapes, etc.

- Fewer mounds, the merrier.
- Time and budget are on your side.
- Two-step method is sufficient for this situation.
  - Apply a bait in spring.
    - Slower acting baits – hydromethylnon, spinosad  
methoprene, pyriproxyfen, spinosad
  - Follow by individual mound treatment.
    - Baits
    - Contact insecticides.

34

For areas with high tolerance... e.g., natural areas, wood line, etc.

- Fire ant colonies are (somewhat) tolerated...
- Manage periodically or as needed with
  - Baits

35

Near body of water, i.e. highly sensitive areas...

- Some chemicals cannot be used due to label restrictions (usually related to high toxicity to aquatic invertebrates); do not use contact insecticides.
- Use baits, but do not apply directly to water. Follow restrictions on buffer zone.
  - abamectin
  - hydramethylnon
  - indoxacarb
  - metaflumizone
  - pyriproxyfen
  - spinosad



36

## Beware (be skeptical) of home remedies!!

- Boiling water
- Club soda
- Kicking the mound
- Shoveling the mound
- Put shade over the mound
- Feed them grits
- Spray them with detergent
- Spray them with gasoline
- Put them on fire!



37