

Taking The Fire Out Of Red Imported Fire Ants



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Red Imported Fire Ant (RIFA)

- *Solenopsis invicta*
- An invasive species
- Infested 330 million acres in US since 1930's



Red Imported Fire Ant

- Social insects that live in large, long lived, highly organized colonies (mounds)
- Mounds may have 1 or multiple queens



Why should we be concerned?

- Cost \$7 billion in control, damage, repair and medical care each year (USDA)
- Displace native ants and animals
 - Predation
 - Competition



Painful Stings

- Swelling and pustules may develop
- ~ 1% of people have **dangerous allergic reaction**
- If experience difficult breathing, rapid heart rate, loss of consciousness, seek emergency medical help promptly



Concerns

- Short out electrical equipment



Photo By:
Carroll EMC, GA

Concerns

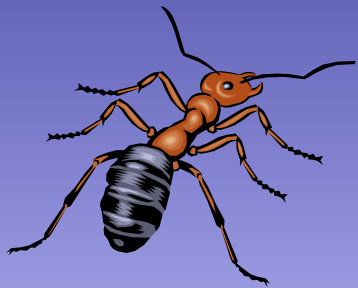
- Detract from aesthetic value of landscape
- Can damage plants, especially seedlings

IFA girdling stem of broccoli transplant (Image by Debbie Roos)



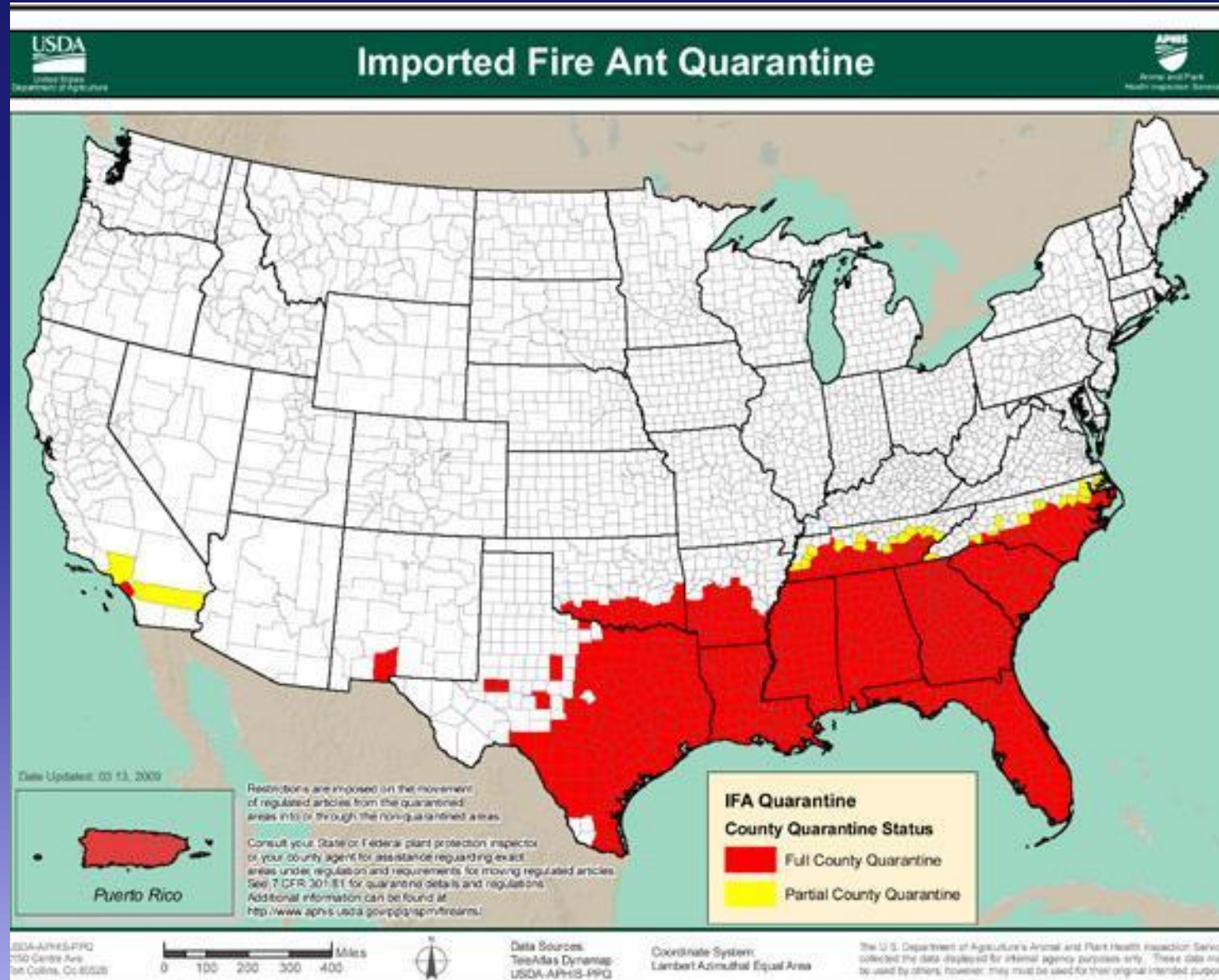
Where did they come from?

- Native of South America
- Accidentally introduced in 1930's to Mobile, Alabama
- First found in NC 1957, Brunswick County



Where are they found in the US?

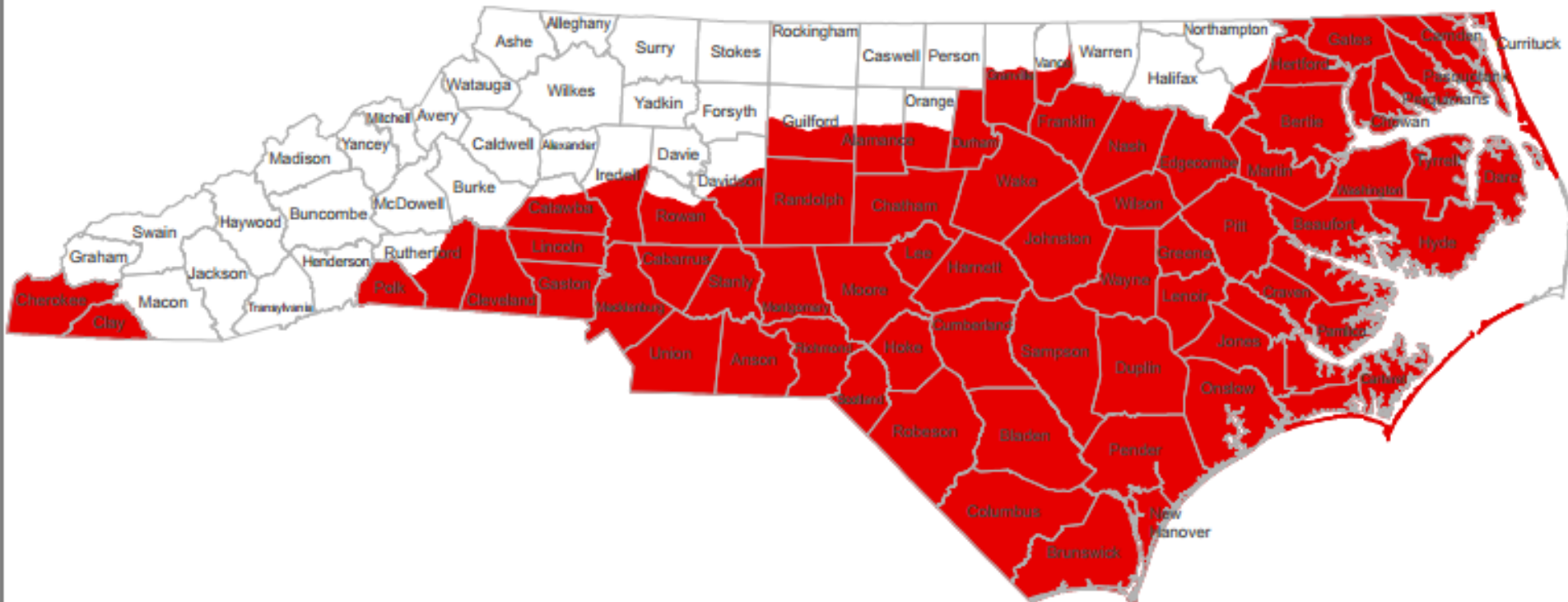
- 330 million acres
- 11 southern states
- 71 of 100 counties in NC



Imported Fire Ant Quarantine Area

North Carolina 2014

<http://www.ncagr.gov/plantindustry/Plant/entomology/documents/fireantmap2014.pdf>



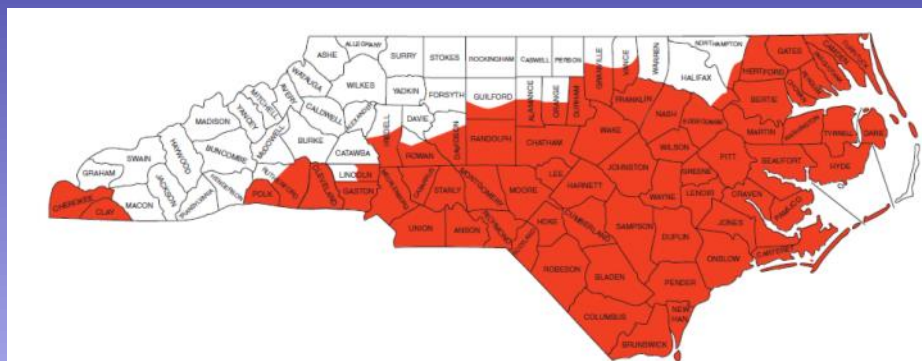
Regulated Area - Movement of regulated articles from this area into or through white area requires inspection.



Non Regulated Area - Movement of articles from or through these areas does not require inspection.

What does the quarantine mean?

- Applies to:
 - Nursery stock
 - Baled hay and straw
 - Earth moving equipment
 - Sod, Soil
- If moved from quarantine area to non quarantine area must be treated and certified
- Regulated by USDA and NCDA



Certification

- Contact **NCDA&CS Plant Industry Division** - Plant Protection Section
- (919) 707-3753
- Protocols in USDA manual
- <http://www.ncagr.gov/plantindustry/plant/entomology/IFA.htm>



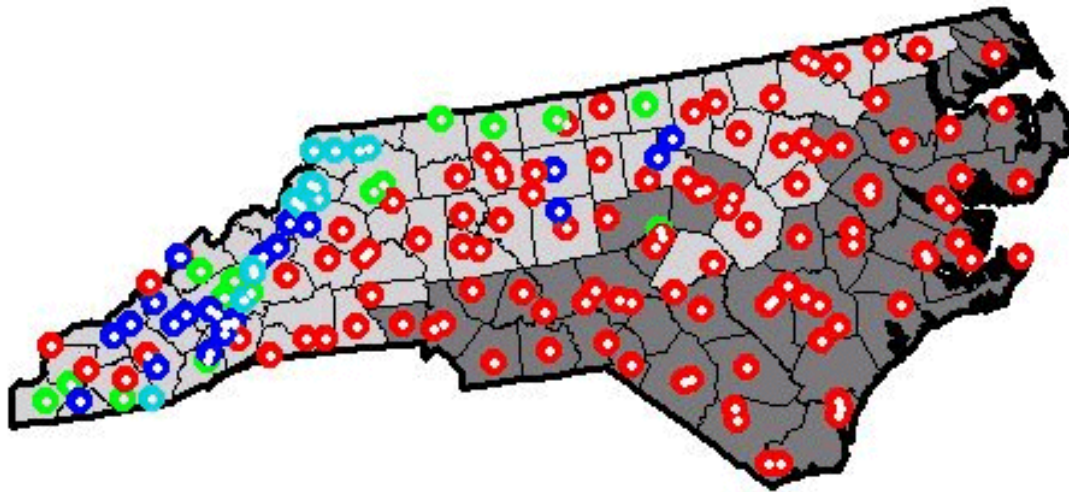
United States Department of Agriculture

Imported Fire Ant: Quarantine Treatments for Nursery Stock, Grass Sod, and Related Materials



Is their range still expanding?

Yes, but winter cold will be ultimate limiting factor



0 50 100 150 200 Miles

University of Arkansas Cooperative Extension Service
Arkansas Forest Resources Center
School of Forest Resources
Univ. of Arkansas - Monticello



Potential Red Imported Fire Ant Range Expansion

RIFA Survival

- Improbable
- Undetermined
- Possible
- Certain

Annual Rainfall

- <Not enough
- >Enough

USDA Quarantine
(May 2000)

http://www.ars.usda.gov/Research/docs.htm?docid=9165&pf=1&cg_id=0

How do they spread?

- Human activities
- Long distance movement
 - Shipping plants, sod, soil, straw, etc.
 - On equipment



How do they spread?

- High reproductive rate
 - Queens lay 800+ eggs a day and live 5-7 yrs
- Mating flights
 - Spring and fall
 - After rain
 - Can fly 10 miles



How do they spread?

- Flooding
- Colonies cling together and float



Understanding Red Imported Fire Ants

- Understanding biology and habits allows more effective management
 - “Know the enemy”
- Begin with correct identification



Importance of Correct Identification

- Native ants compete with RIFA and help control
 - At least **164 species of ants** in NC piedmont!
- Broadcast granular insecticides favor RIFA over native ants

Field Ant



Acorn Ant



Fungus Growing Ant



Big Headed Ant



Identifying RIFA (red imported fire ant)

- Physical Characteristics
- Behavior
- Mounds



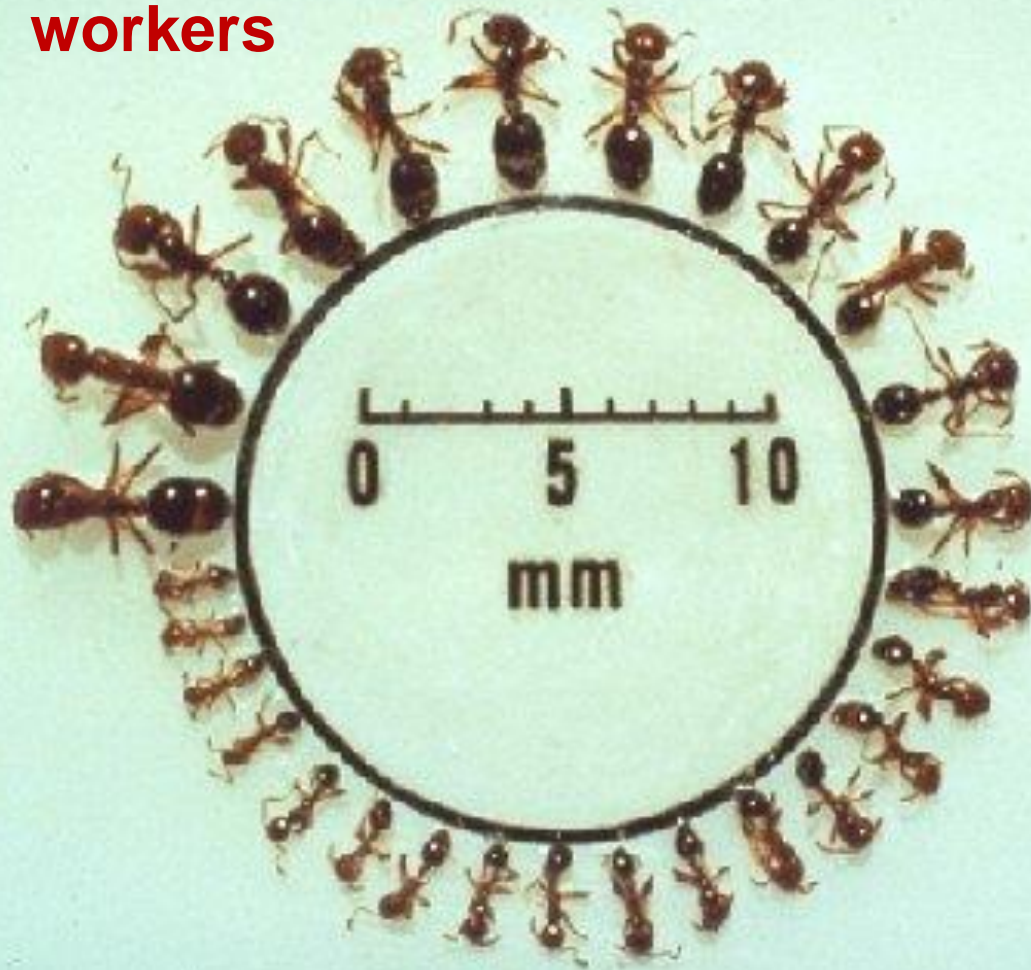
Physical Characteristics

- Multiple, small sizes - 1/8 to 1/4 inch long
- reddish-brown-black
- tail end darker
- thin waist



Range of Adult Sizes

workers



queen

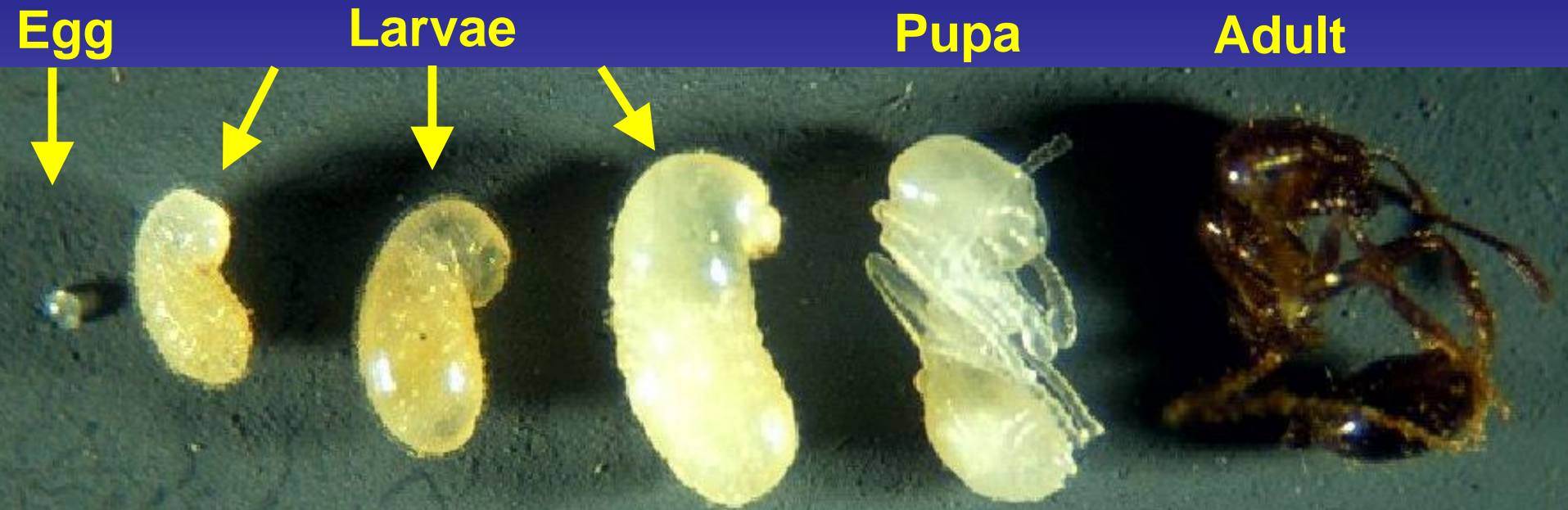


White line = 1"



Fire Ant Life Stages

- 4 distinct stages: complete metamorphosis
- Only adults leave the mound
- When mound disturbed, adult workers save eggs, larvae, and pupa



Behavior

- Aggressive!
- Attack when disturbed – bite and sting
- Will climb up to attack
- Only ant whose sting results in pustule



Mounds

- Large and fluffy
- No single entrance hole
- Little activity on the surface
- Dome shaped in clay; more spread out in sand



Mound Location

- Sunny, open areas
- South facing exposures
- Disturbed areas
- Trees, posts
- Edge and beneath pavement
- Electrical equipment



Is this a fire ant mound?



No – Pyramid Ant



No – Field Ant

No – Pavement Ant

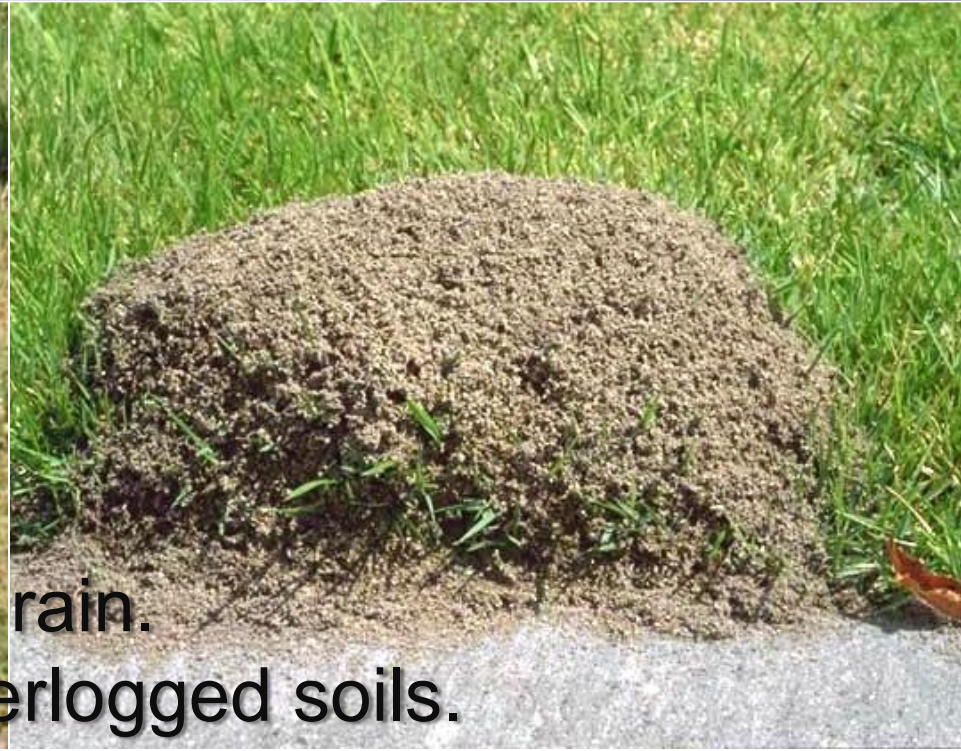


Classic IFA Mound in Clay Soil



During drought and in compacted soils, fire ant mound mounds may be hard to see

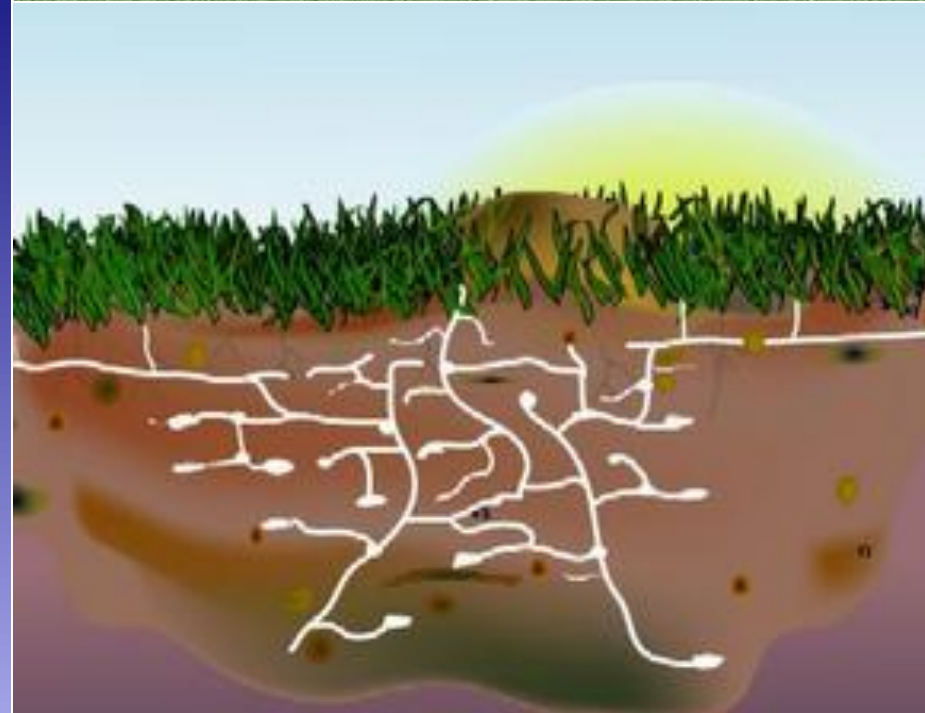
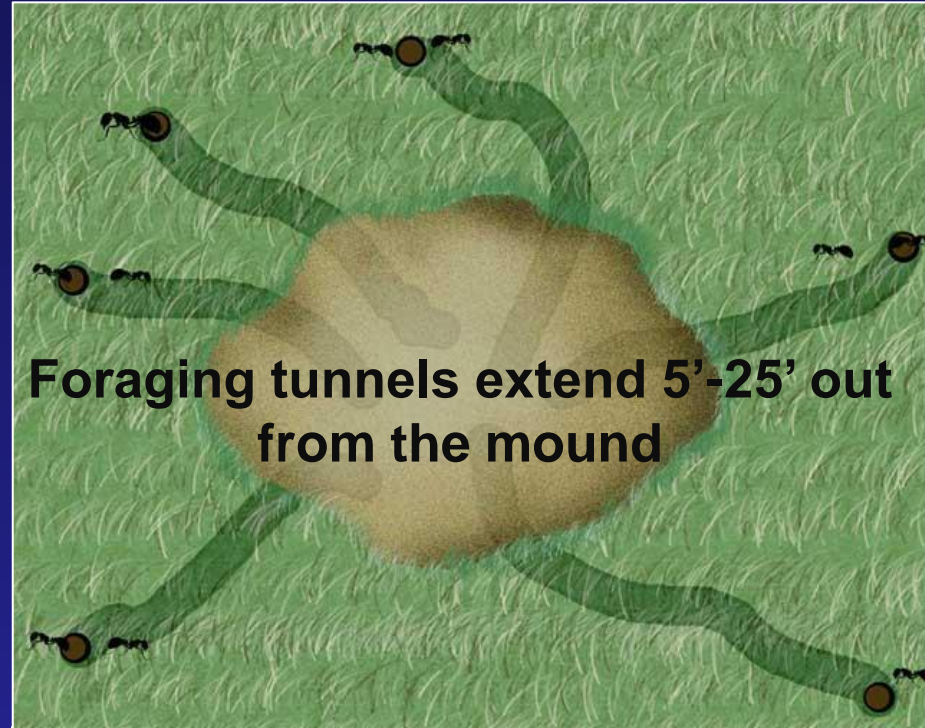




Mounds often “pop up” after rain.
Ants build up to escape waterlogged soils.

What's Inside?

- Queen laying eggs
- 100,000+ workers raising young, feeding colony
- **Subsurface tunnels for foraging away from mound**
- Deep tunnels to water table
- May extend several feet deep



When Mound Disturbed

- Queen removed in < 60 seconds
- Disturbed mounds often relocate
- To destroy mound, must kill queen or render sterile
- **Don't disturb mound when treating!!!**



How do fire ants feed?

- “Communal Stomach”
- Workers forage, bring food back to colony
- Workers cannot eat solids – can only ingest liquids
- Food must pass from workers through colony to queen



What do fire ants eat?

- Everything!
- **Sugars**: nectar, honeydew secreted by aphids, scale
- **Fats**: oils in plants and seeds
- **Protein**: insects, reptiles, birds, rodents



Not sure you have RIFA?

A simple test:

- Place pieces of hot dog or potato chip in the area
- Check in 30-45 minutes
- If RIFA in area they will find!



What can we do?

- Accept RIFA will never be eliminated
- Mounds can be controlled in a defined area
- Chance of contact can be minimized
- Reinfestation will occur
- Use control methods that minimize impact to native ants



What can we do?

- **Minimize new infestations**
 - Inspect plant material, sod, topsoil, mulch and other materials before installing
- **Sanitation**
 - RIFA attracted to greasy food waste and pet food
 - Empty trash in parks frequently
 - Remove uneaten pet food



When is treatment needed?

When mounds/ants are present where there is a high likelihood of contact by people, pets, or livestock

- Parks
- Playgrounds
- Sports fields
- Break/picnic areas
- Lawns
- Gardens
- Crops
- Pastures



Home Remedies Don't Work!

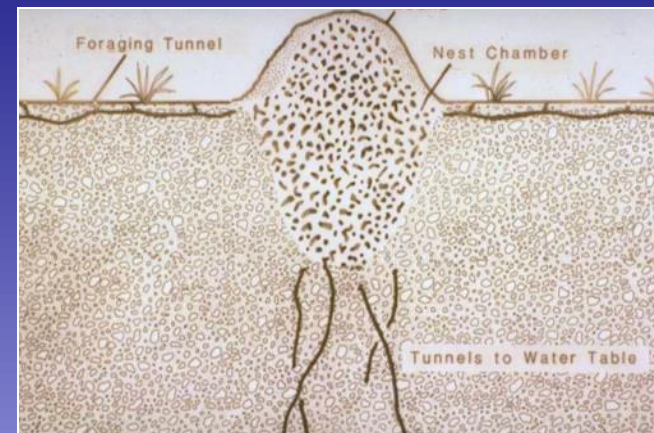
- Grits, coffee grounds
- Club soda, orange peel, molasses
- Cinnamon, aspartame
- **Never apply:** gasoline, kerosene, bleach, ammonia, battery acid!
 - Doesn't work, pollutes soil and water, hazardous to handle
- Never use **boric acid** (Borax) outside!



Workers
can't eat
solid food!

Non Chemical: Boiling Water

- 3 gallons/mound – must be boiling or just below
- Immediate death
- Kills mound ~ 60% time, ~ 40% mound simply relocates
- More effective just after rain, mild temperatures
- Kills surrounding vegetation
- Use extreme caution!!!



Pesticide Formulations

- **Dusts**
- **Drenches**
- **Granules**
 - Greatest negative impact on native ants, especially when broadcast
- **Baits**
 - Most effective but slower acting



Products containing **organic** and **synthetic** active ingredients are available locally

Products in Local Markets

Pittsboro Feed

"Feed or Seed...We cover your need"



Pittsboro



Siler City



Pesticide Safety

- Always read and follow label directions!
- **Keep animals and children out of area while treating** – check label for additional restrictions
- Avoid use of pesticides within 50' of wells, ponds, streams



Read the Label

- Active ingredient
- Application rate and method
- Sites where can legally be applied
- Personal protective equipment
- First aid
- Environmental hazards



ACTIVE INGREDIENTS / INGREDIENTES ACTIVO:	
Zeta-Cypermethrin*	0.05%
Bifenthrin** / Bifentrin**	0.20%
OTHER INGREDIENTS / OTROS INGREDIENTES	99.75%
TOTAL	100.00%
* Cis/trans isomer ratio: Max 75% (±) cis and Min. 25% (±) trans	
** Cis isomers 97% minimum, trans isomers 3% maximum.	
* Isómeros cis 97% como máx., isómeros trans 3% como máx.	
EPA Reg. No. 279-3344-71004	EPA Est. No. 67572-GA-1, 67572-GA-2

Site Considerations

- “It is a violation of Federal law to use this product in a manner inconsistent with its labeling”
- The label will itemize sites that are legitimate
- Other sites are not legal



Use of Products

- There is no single “best” product for all situations
- Select treatments according to the situation
 - Location of mound
 - # of mounds
 - How fast results are needed
 - Cost



Treatment Options



Mound Treatment

- Small areas
- Less than 20 mounds/acre
- Less impact on native ants
- Most give very quick results

Broadcast Treatment

- Large areas
- More than 20 mounds/acre
- Greater impact on native ants
- Take longer but typically more effective

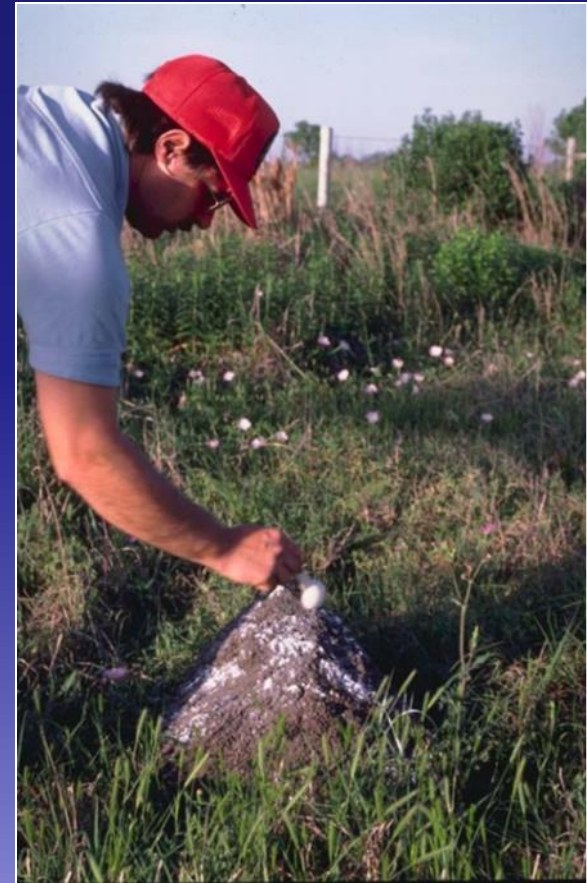
Individual Mound Treatments

- Preferred method for a few mounds
 - Cheaper
 - Targeted
 - Requires less time
- Strategy varies by product



Dry Mound Treatments

- **Dusts**
- **Some Granules**
- Apply on mound
- May need to water in
 - Follow product directions
- Do Not Disturb the Mound
 - Unless label directs



Dry Mound Treatments

Advantages

- Relatively fast
- Insecticides applied only to targeted mound
- Relatively easy

Disadvantages

- Expensive for large areas
- Ants not in mound may start new nest

Dry Mound Treatments: Active Ingredients

- Carbaryl (Sevin)
- Acephate (Orthene)
- Synthetic pyrethroids
 - Bifenthrin
 - Deltamethrin
 - Cyfluthrin
- Organic:
 - Pyrethrins
 - Diatomaceous Earth

A.I.:
Pyrethrin
Piperonyl butoxide
Silicon dioxide



Mound Treatments: Dusts



Deltamethrin



Permethrin



Acephate

Mound Drenches

- Insecticide + water
- Trickle through mound; kill on contact
- Use for quick control
- Will miss ants actively foraging
- May not kill queen



Mound Drenches

Advantages

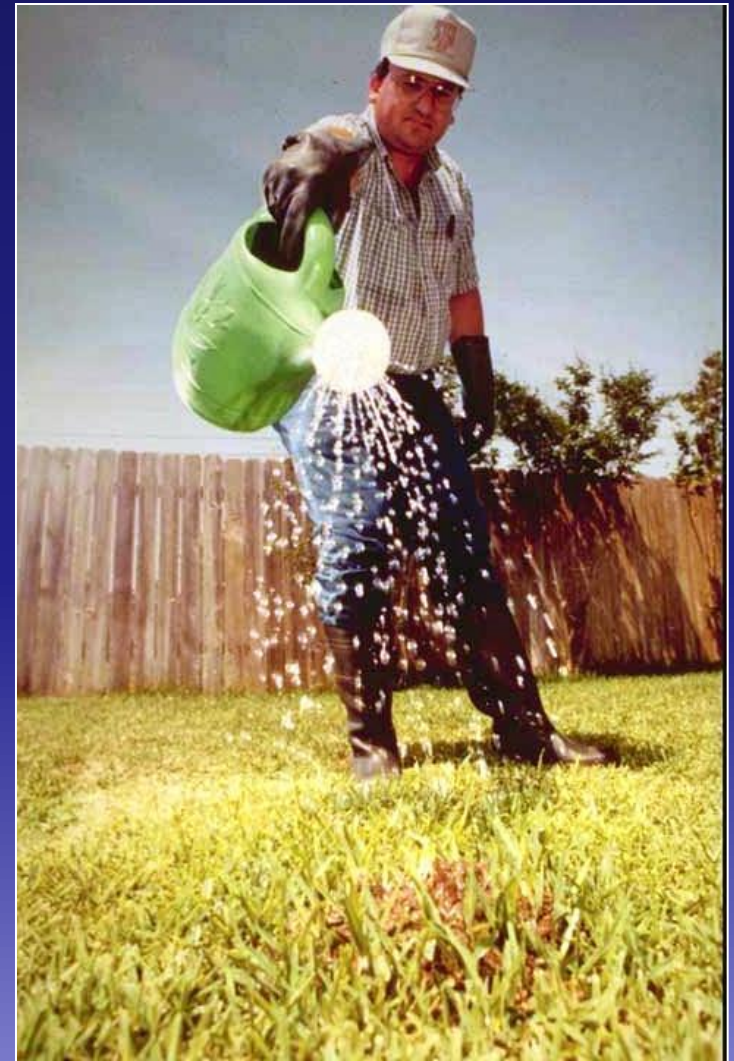
- Fast acting
- Insecticides applied only to targeted mound

Disadvantages

- More expensive for large areas
- May not reach queen under objects
- More labor intensive
- Requires more handling (mixing)

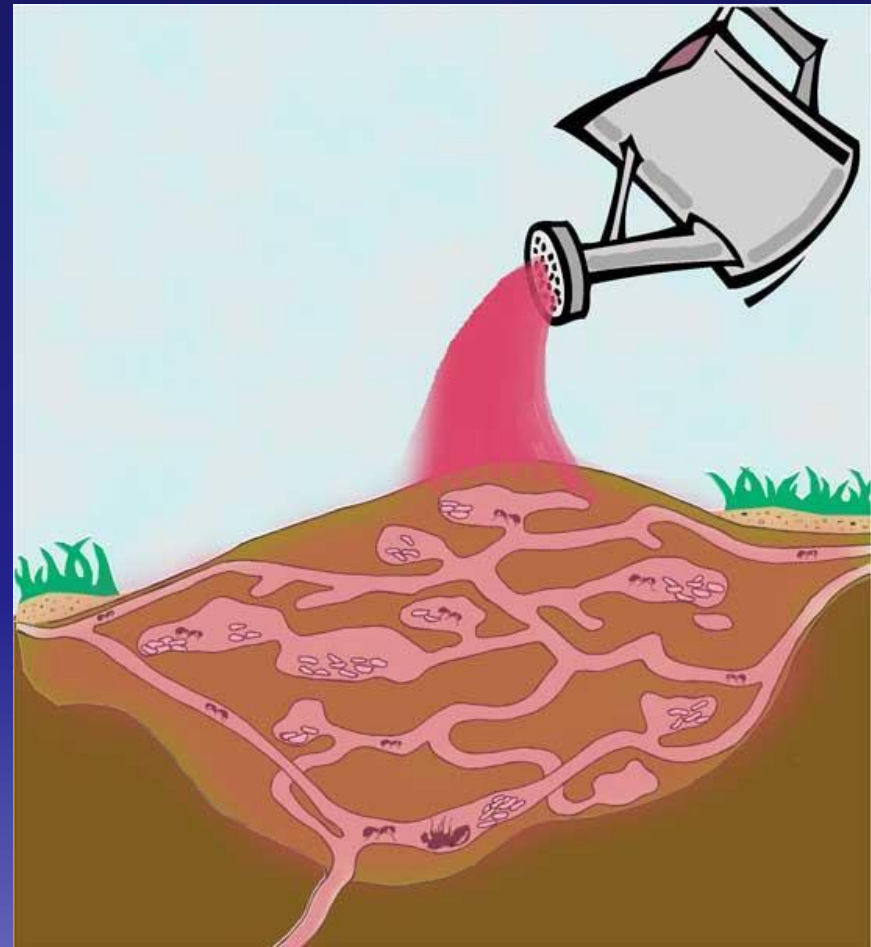
How to Apply

- Amount of drench applied is more important than concentration of insecticide
- Most effective following rain – during drought, fire ants move deeper into the ground



How to Apply

- Start at outside of mound to cut off exit tunnels
- Continue to interior
- 2 gallons for a 12" diameter mound
 - An additional gallon for every 6" in diameter



Do not disturb the mound first

Mound Drenches: Active Ingredients

- Synthetic pyrethroids
 - Bifenthrin
 - Permethrin
 - Other “thrin’s”
- Organic:
 - Spinosad
 - D-limonene



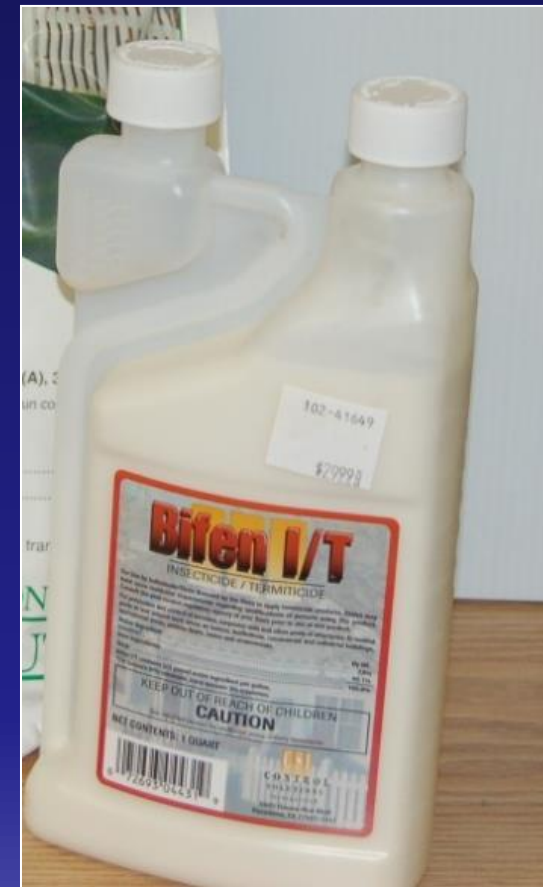
Drenches



D-limonene



Zeta-cypermethrin



Bifenthrin

Mound Treatment: Baits

- Insecticide + ant attractants
 - Corn grit, soybean oil
- Workers bring 'food' to colony
 - Fed to queen
- Slower acting but easy
 - Must survive long enough to allow feeding throughout mound
 - Depending on product, see results in days to months



Bait Treatments

Advantages

- Quick and easy to use
- Among safest fire ant controls
- Least expensive
- Less labor required

Disadvantages

- Slower to work
- Ants must be actively foraging
- Ground should be dry, no rain
- Baits can spoil if not stored properly

Not sure RIFA are foraging?

- Potato chip or hot dog test
- Should find within 30 minutes



Bait Treatments

- Apply **around, not on**, the mound
- Most effective in spring and fall when ants are actively foraging (70 – 85 degrees)
- Must be kept cool & dry (air tight container)
- Apply when ground is dry
- Do not irrigate or use when rain is expected within 24 hrs

Around, Not On, The Mound

Potato chip demonstration . . .



30 minutes later . . .



**Ants foraging potato chip
outside the mound**



**No ants foraging potato
chip on top of mound**

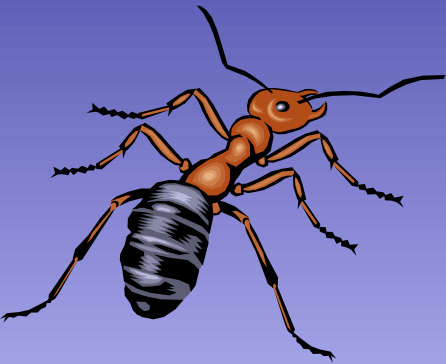
Bait Safety

- No hazard to children, pets, birds, earthworms when properly applied
- Less attractive to native ants
- Safe to use in bee yards
- RIFA remove bait from soil surface



Baits Most Effective in Fall

- Lowers fire ant population for next spring
 - Fewer mating queens
- Active foraging during mild weather
- Baits continue acting once taken in
- Weaken colony going into the winter



Faster Acting Baits

- Results in 2-6 weeks
- Active ingredients include:
 - Indoxacarb (fastest, 3 days)
 - Hydramethylnon (Amdro)
 - Abamectin (slower)
 - Spinosad – some products certified organic
- Most cannot be used around vegetables, crops, pastures



Bait stations can be used in sensitive areas

Baits: Spinosad Organic

Contains Spinosad!

ferti·lome®

COME AND GET IT!

FIRE ANT KILLER

- Kills The Queen.
- Kills The Mound.
- Dead Ants In 24 Hours.
- Covers Up To 10,000 Square Feet.

ACTIVE INGREDIENT:
 Spinosad (a mixture of spinosyn A and spinosyn D)..... 0.015%

INERT INGREDIENTS:..... 99.985%

TOTAL:.....100.000%

U.S. Patent No. 5,362,634 and 5,496,931

**KEEP OUT OF REACH OF CHILDREN
 CAUTION/PRECAUCION**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)
 See Back Panel For Additional Precautionary Statements.

NET WEIGHT 1 LB.

RESEALABLE BAG!

PRESS TO RESEAL

OMRI LISTED For use in ORGANIC production.

GREEN LIGHT

OMRI LISTED

Fire Ant Control

with Conserve®

- Kills Fire Ants & Harvester Ants
- Kills The Queen
- Stops New Mounds

Controls Up To 2 Months
 Treats Over 10,000 Sq. Ft. or 22 Mounds
 No Watering Necessary

For Use In Home Gardens

ACTIVE INGREDIENT:
 Spinosad*..... 0.015%

OTHER INGREDIENTS:..... 99.985%

TOTAL:.....100.000%

*A mixture of Spinosyn A & Spinosyn D
 U.S. Patent No. 5,362,634 and 5,496,931

NET WT. 1 LB. (454g)

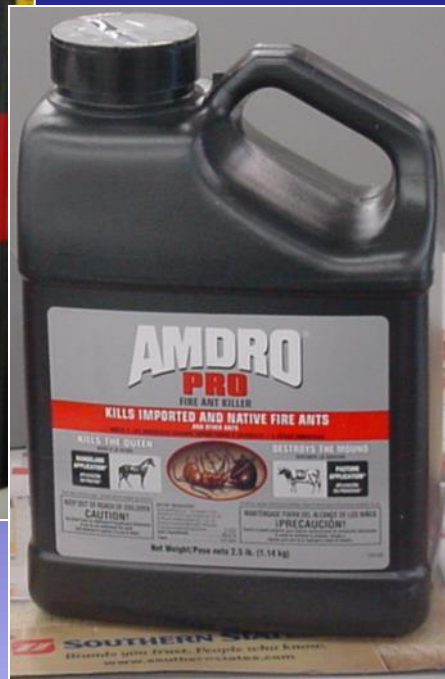
**KEEP OUT OF REACH OF CHILDREN
 CAUTION** See Back Panel For Additional Precautionary Statements.

**MANTÉNGALO FUERA DEL ALCANCE DE LOS NIÑOS
 PRECAUCION** Ver detrás el panel para las declaraciones preventivas adicionales.

Baits



Indoxacarb



Hydramethylnon

Slower Acting Baits

- Contain **Insect Growth Regulators (IGR's)**
- Do not kill directly, render queen sterile, may also interrupt molting
- **2 – 6 months** to see results
- **Active Ingredients:**
 - Fenoxycarb (Award)
 - Methoprene (Extinguish)
 - Pyriproxyfen (Esteem, Distance)
- Most can be used around vegetables, crops, pastures



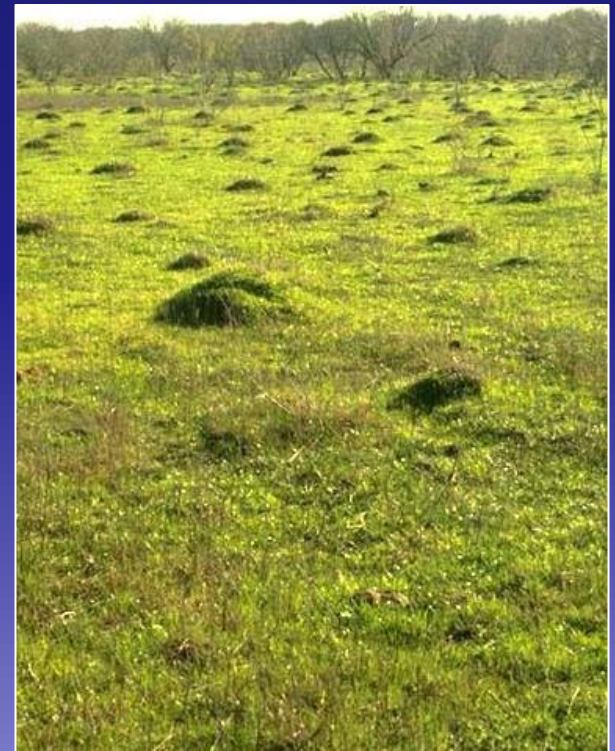
Combination Products

- Some products contain both a faster acting ingredient + IGR
- Hydromethylnon + Methoprene
- Quick acting + longer residual
- Extinguish Plus
- Amdro FireStrike



Wide Area Treatments

- For large areas: pastures, parks, athletic fields
- Over 20 mounds/acre
- Baits
 - Less impact on other ants and insects
- Granules:
 - Greatest impact on other ants and insects



Broadcast

- Use designated spreaders – see label
 - Hand held spreader
 - Vehicle mounted spreader
 - Some products designed to use with fertilizer spreaders
- Measure area and calibrate spreader



Broadcast Granules

- Kill native ants and other insects
- Cycle of treatment - RIFA re-infest quicker
- Active Ingredients:
 - Fipronil (restricted use)
 - Synthetic pyrethroids
 - Bifenthrin
 - Zeta-cypermethrin
 - Gamma-cyhalothrin
 - Lambda-cyhalothrin
 - Deltamethrin



The Texas Two-Step

- Texas A & M University entomologists report that 77% of users claim better control



Step 1: Let Them Eat Bait

- Treat area with bait
- Use appropriate spreader and calibrate according to label directions



Step 2:

Treat individual mounds

1 week later if necessary

- Treat *problem* mounds with an individual mound treatment
- Not all mounds need to be treated



Follow up

- Always evaluate results
- Surviving ants may attempt to reestablish the mound
 - Re-treat if necessary
- Encourage surrounding property owners to treat in areas with high densities



Keys to Effectiveness

- Time of application
 - Spring and fall when close to surface and actively foraging
 - Temps between 70-85 degrees
- Fresh bait, dry conditions
- Patience – allow time to work
- Persistence – evaluate results



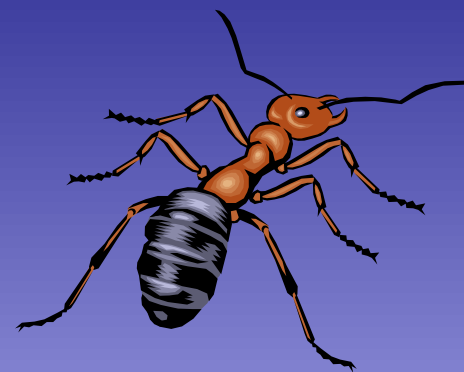
Future: Biological Control

- Phorid fly species
- Pathogens, nematodes
- Will limit, not eliminate RIFA



What's the Problem With Livestock?

- Forage Quality
- Hay Production
- Calving Issues
- Animal Injury
- Reduced Feeding Area
- Infested Feed



Pasture and Forage



- Must see the agricultural exemption on the label.
- Products that can be used –
 - Amdro Pro
 - Extinguish or Extinguish Plus
 - Esteem
 - Come and Get It

application. The bait will become unattractive to ants if it becomes wet. Ants that are actively foraging will begin picking up the bait soon after application.

Grass Forage (Pasture and Rangeland)

EXTINGUISH® PLUS may be applied to grass forage (pastures and rangeland) for the control of fire ants only in the following states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. Use on grass forage (pastures and rangeland) in states other than those listed is unlawful. See Outdoor Use table for application directions. Do not exceed 8 pounds per acre per year or more than 4 times a year, with a minimum re-treatment interval of 90 days. Do not bale and cut treated pastures and rangelands for 7 days following application. These cutting and baling hay restrictions for pasture and rangeland do not apply when the treated pasture and rangeland is used solely to support **COMPANION ANIMALS** (e.g., horses, llamas, etc.). Companion animals grazed on treated areas cannot be used for food or feed. **EXTINGUISH® PLUS** may be used on uncultivated, agricultural, non-food crop and non-agricultural land.

Container or Nursery Stock

Use **EXTINGUISH® PLUS** in and around container or field grown ornamental nursery and non-bearing nursery stock. **EXTINGUISH® PLUS** may also be applied to the soil around non-bearing fruit or nut trees. Do not harvest food/feed from non-bearing fruit/nut tree nursery stocks within 1 year of application, if by chance, they bear fruit within that time. Apply to sod farms or other types of commercial turf. Do not graze or feed grass clippings to livestock.

Do not use on vegetable or other food crops, or commercial seed production.

REFILLABLE BAIT STATIONS

Use **EXTINGUISH® PLUS** in refillable bait stations. Place up to 1 ounce (2 tablespoons) of **EXTINGUISH® PLUS** per refillable bait station. Locate stations along the perimeter of a structure or fence line with 1 station every 15 to 30 linear feet. Locate stations near

and in the non-food/feed areas of institutional, warehousing, and commercial establishments, such as groceries and supermarkets, hotels and motels, hospitals and nursing homes, schools, laboratories, computer facilities, food storage areas, sewers, transportation equipment, pet shops or zoos, and in the inedible product areas of meat or poultry plants. Non-food/feed areas are areas such as garbage rooms, lavatories, floor drains (to sewers), entries and vestibules, offices, locker rooms, machine rooms, boiler rooms, garages, mop closets and storage (after canning or bottling).

In the home, cover all food processing surfaces and utensils during treatment or wash thoroughly before use. Cover or remove exposed food.

Using a duster or similar equipment, apply bait **ONLY** into cracks and crevices, or other inaccessible areas such as, but not limited to, structural voids, unfinished attics or crawl spaces. Apply 0.25 - 0.5 ounce (2 teaspoons - 1 tablespoon) per crack, crevice, or other inaccessible areas where ants are entering the structure or where ants are nesting. Apply evenly in unfinished attics and crawl spaces at a rate of 0.25 ounce (2 teaspoons) per 100 square feet only if the space is secured or otherwise inaccessible to children or pets.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

STORAGE

Store in cool, dry, secure place and keep container tightly closed. Store container away from pets. This product is formulated with oil. Prolonged exposure to air may turn oil rancid and reduce the attractiveness of the bait. Use within 3 months after opening.

PESTICIDE DISPOSAL

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL

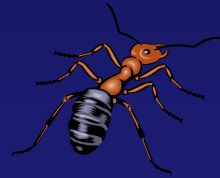
(Plastic) Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose





SOUTHERN STATES
Brands you trust. People who know.
www.southernstates.com

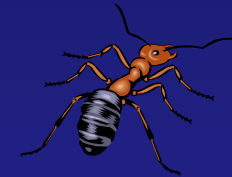
How do I?



- Individual Mound Treatment

- Use labeled rate

- Flag treated mounds to determine any new mounds that occur



- Broadcast Treatments

- See label for rates and maximums

- Need special spreader that puts out small amounts




Product Selection

- Whichever one you like or can get
- Save some money
 - Have 2 products on hand
 - Use those labeled for ag. use in your pasture or cropland
 - Ornamental & Turf products usually cheaper so keep that on hand for your yard and non ag. land areas.

Learn More:

<http://www.extension.org/fire+ants>

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