Ants – The #1 Pest in Schools Webinar

Photo: Joseph Berger at Bugwood.org

Center of Expertise for School IPM

Protecting Children in Schools from the Health Risks associated with Pests and Pesticides

Pesticide Safety, Integrated Pest Management and Your School

Center of Expertise for School IPM

IPM Basics

Pesticides

Physical & Mechanical Controls

Cultural & Sanitation Practices

Education & Communication

Benefits of School IPM

- **Smart**: addresses the root cause of pest problems
- **Sensible**: provides a healthier learning environment
- **Sustainable**: better long-term control of pests

Presenters

Dawn Gouge, Ph.D.

- Associate Professor and Associate Specialist – Urban Entomologist
- University of Arizona, Department of Entomology.
- Integrated Pest Management (IPM) specialist since 1995.
- Will introduce IPM for ants, common ants pests, and their control .

Lawrence "Fudd" Graham, Ph.D.

- Research Fellow and Extension Specialist in the Entomology and plant Pathology Dept. at Auburn University.
- Involved in IPM since his college days and working with cotton.
- Will discuss management of fire ants that plague southern schools.

Daniel Suiter Ph.D.,

- Professor of Urban Pest Management at the University of Georgia.
- Development of extension, research and education programs on the management of structural household pests.
- Will show us how to identify and control carpenter ants.

Fred Remelius,

- Director of Operations at the Upper Merion Area (PA) School District.
- 35 years of experience in Facilities Management.
- BS in Civil Engineering and MBA from Queens Univ.
- Will discuss his district's ant challenges and the IPM practices.

Ants the #1 Pest in Schools

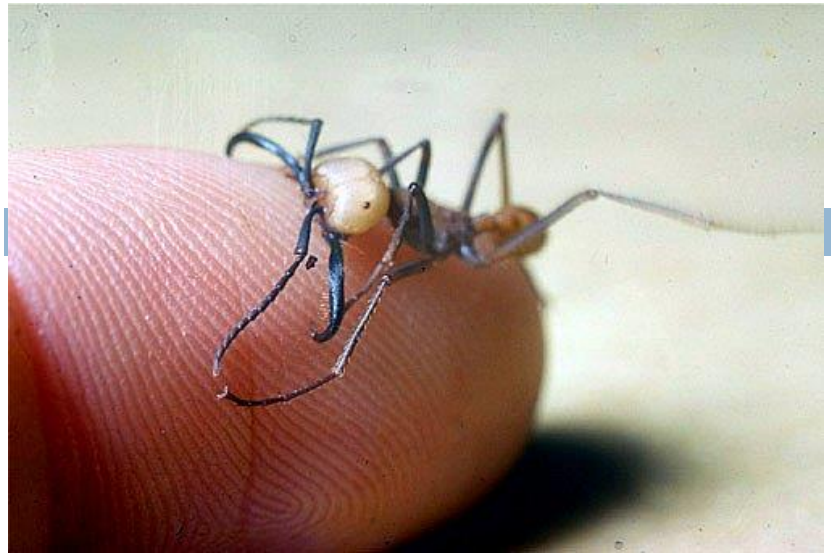
Dawn H. Gouge, University of Arizona

Lawrence 'Fudd' Graham, Auburn University

Dan Suiter, University of Georgia

Frederick Remelius, Upper Merion Area School District

EPA Center of Expertise for School IPM



Bite

Sting

…Or both!!

www.alexanderwild.com

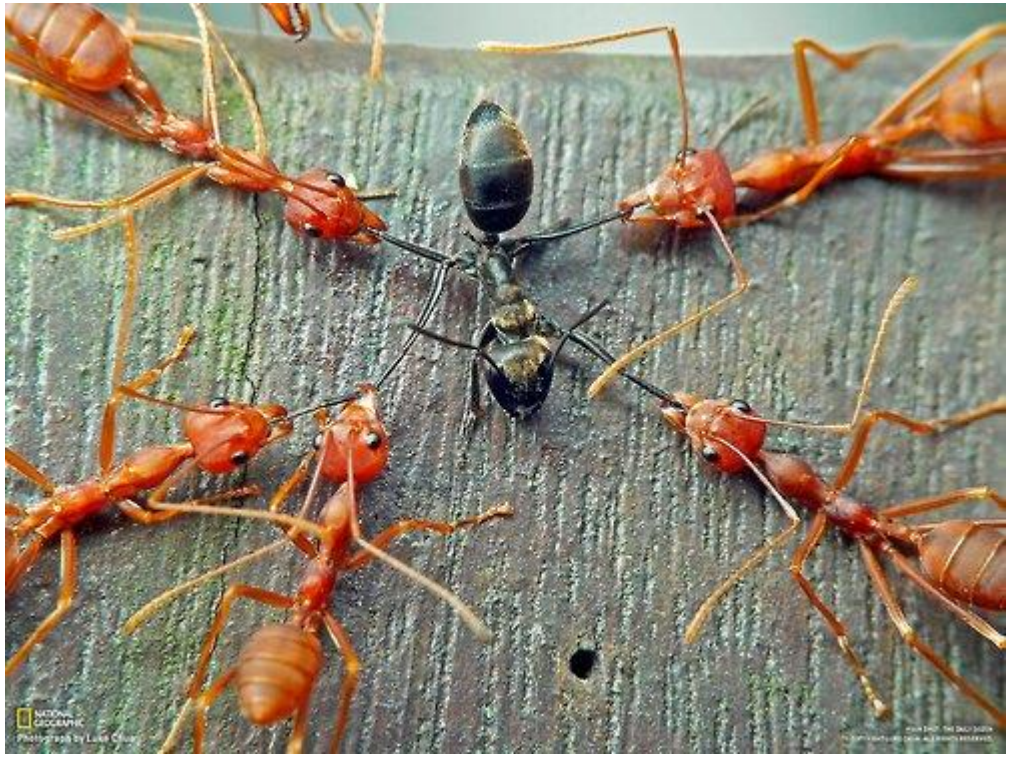
Astonishing and Amazing Ants

- Recorded species: >12,500
- Estimated 20,000 species ~ 700 in the US
- Use pheromones to communicate (ant trials)
- Social insects that undergo complete metamorphosis
  - Females (workers, soldiers, and queens)
  - Males (drones)
- Ecologically significant

www.alexanderwild.com

Antastic 20%!

- Differences in diet, nesting and behavior
  - Slave-raiding
  - Vampirism
  - Fungal cultivation
  - Suicidal acts to protect colony
  - Blockading
  - Raft forming
  - Herding
  - Building
  - Honey potting



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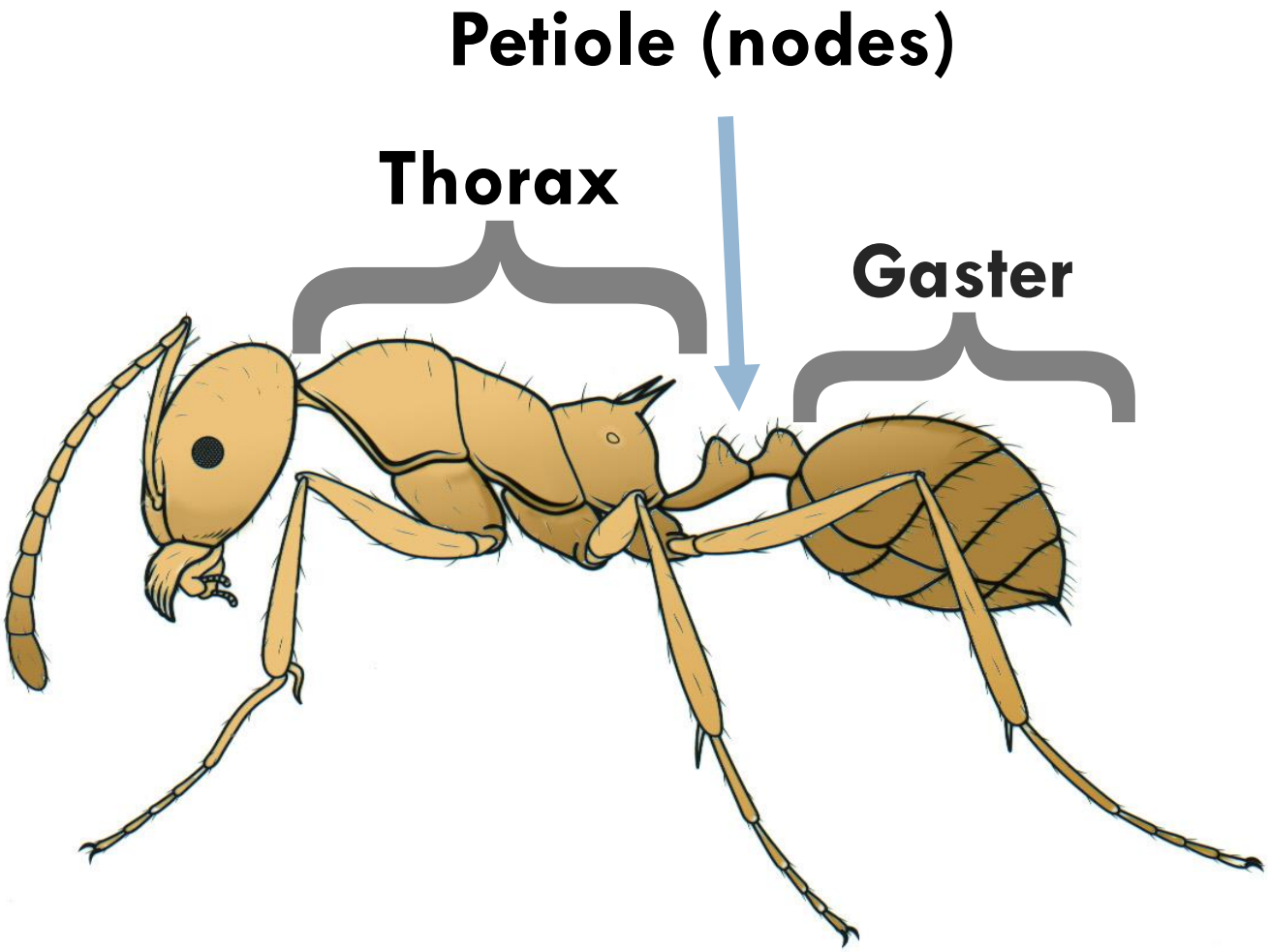
One Size Fits One Ant

- Because of these great differences, effective management strategies differ enormously

Ant or Termite?

- Ants
  - Elbowed antenna
  - Skinny waist
- Termites
  - Straight antenna
  - Thick waist
  - Equal wing size

Basic Ant Anatomy

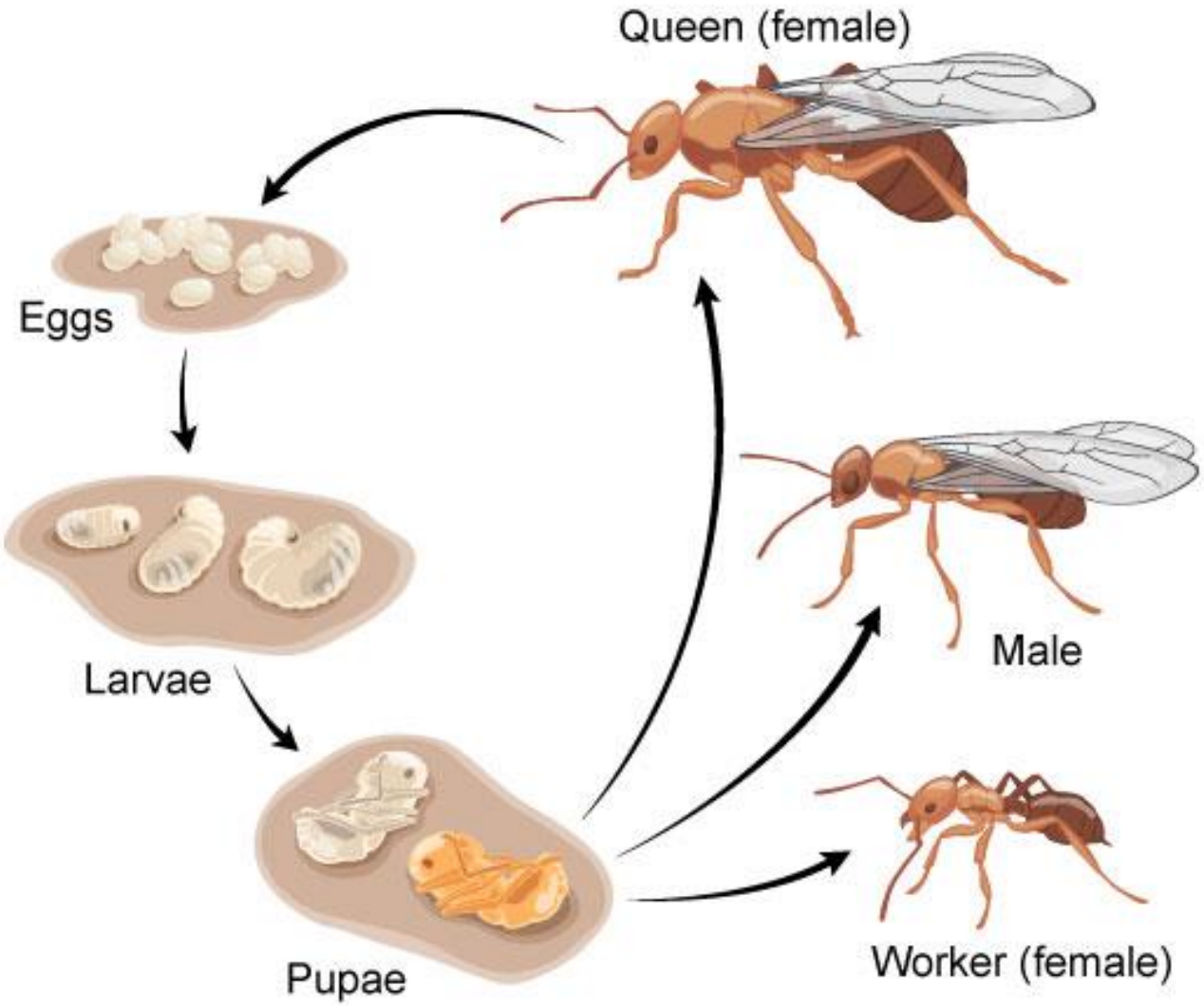


1 Node vs. 2 Node Ants

Argentine

Leaf cutter

Life Cycle



Cute Queens

www.alexanderwild.com

Queens are relatively large, with 3 spot "crown" between her compound eyes

Camponotus Carpenter ant

Oviposition - Egg laying

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Larvae (brood)

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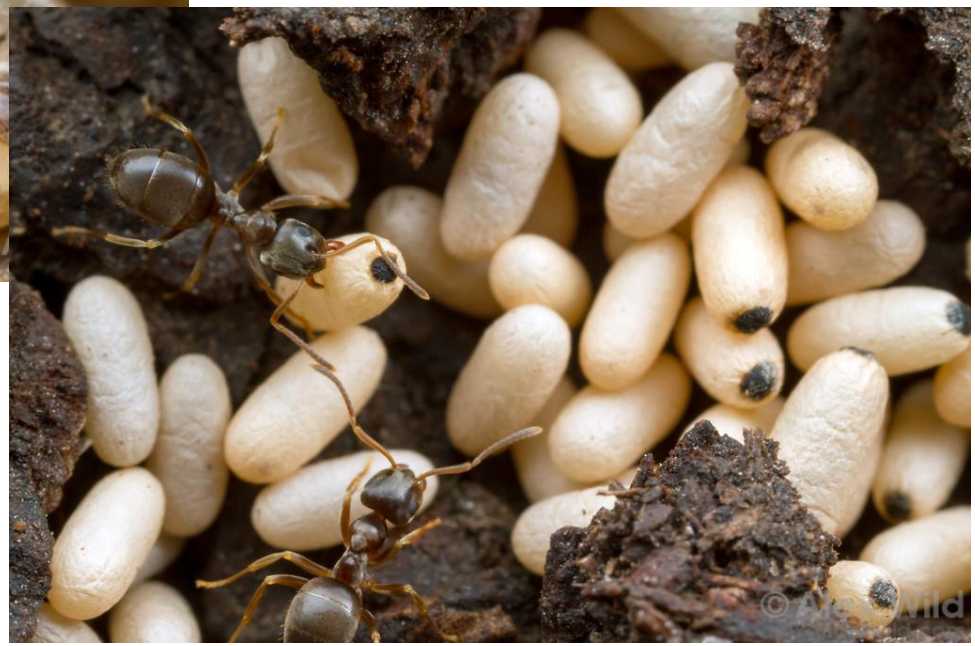
Food Sharing

Trophallaxis

www.alexanderwild.com

Pupae (exarate or in a cocoon)



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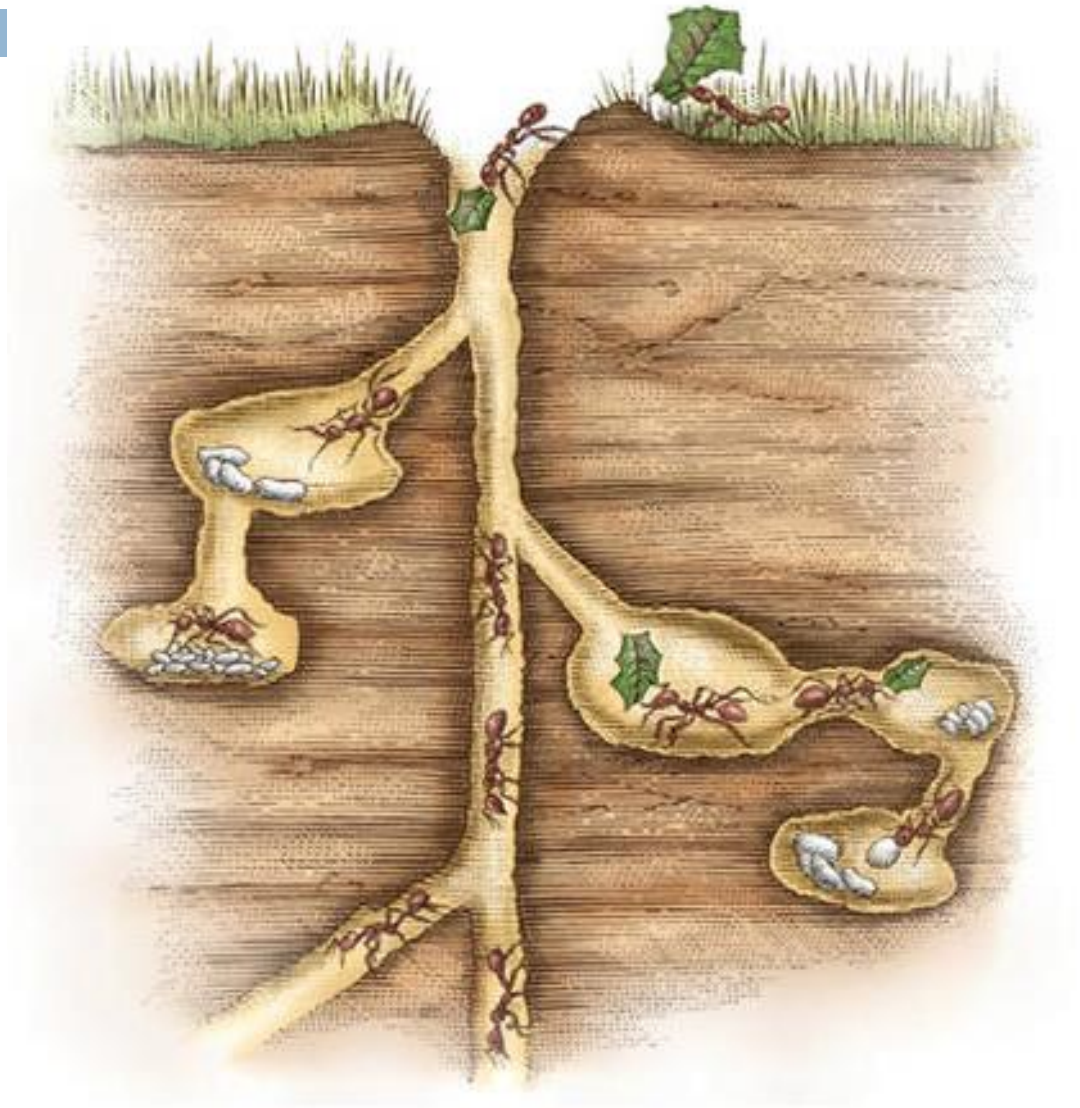
Ecological Services

- Soil aerators
- Decomposers
- Soil compilers (nutrient accumulation)



Ant Interactions

- Ants and plants
- Ants and aphids
- Seed dispersal

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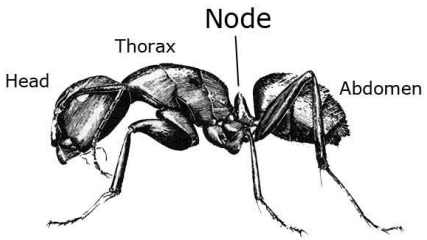
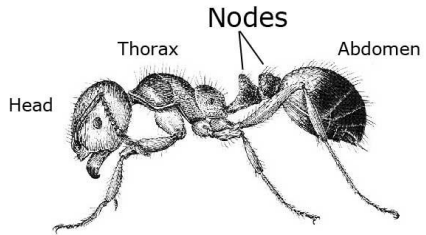
Collecting Ants for Identification

- Vials with 95% ethyl alcohol
- Hard plastic container, put in the freezer overnight
- Collect with a paintbrush or scoop them up

Common Ants (there are more)

- Argentine
- Allegheny Mound
- Carpenter
- Citronella
- Crazy
- Caribbean crazy
- White-footed
- Field
- Ghost
- False honey
- Velvety tree
- Cornfield
- Odorous house
- Pyramid
- Rover
- Pavement
- Pharaoh
- Fire
- Thief
- Harvester
- Acrobat
- Big-headed
- Little black
- Leaf-cutter





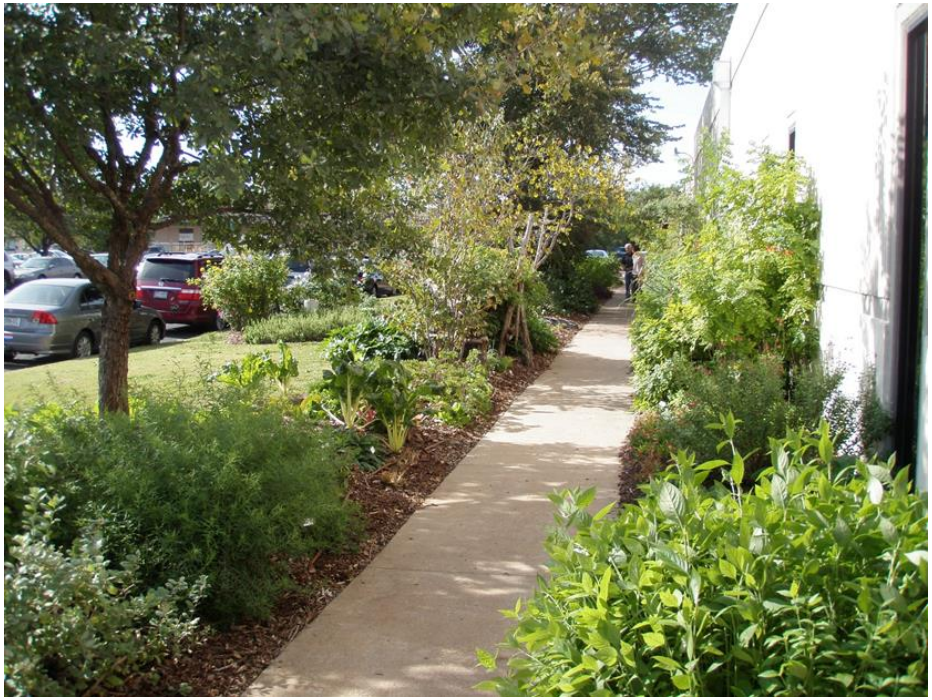
Identification: Knowledge is Power

Determining ant species will tell you:

- Food preferences
- Where they are nesting
- If they are a problem
- How to management if they are a pest
  - Tramp
  - Stationary
  - Nomadic

Ant Population Management

- Inspect and monitoring
- Identify
- Sanitation/Physical/Mechanical
- Exclusion
- Heat/Cold
- Cultural
- Biological Control
- Chemical



Find the Source

- The best way to treat is at the colony nest site
- Spraying individual ants is not effective

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It's You or the Ant Queen

Ant Population Management

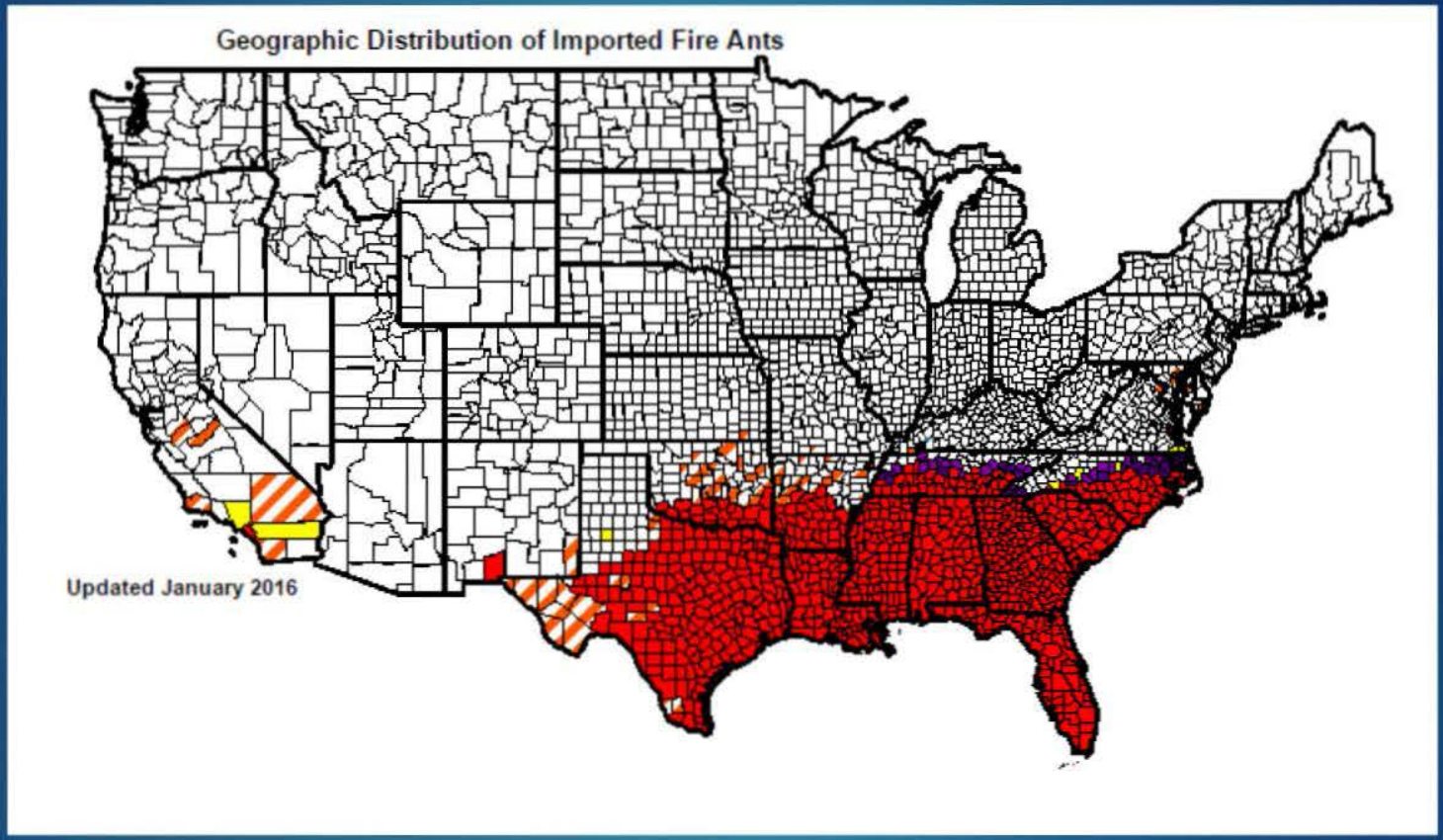
Chemicals

- Baits
  - Pre-Baiting
  - Direct Kill (Best If Slow)
  - Insect Growth Regulators (Slow)
  - Secondary Poisoning (Trophallaxis)
  - Size Of Particles (Important)
  - Sugar/Oil/Protein (Variable)
- Preference is ant specific and activity specific

Fire Ant Management Using Baits

AUBURN UNIVERSITY

extension
ALABAMA A&M & AUBURN UNIVERSITIES



http://www.arcgis.com/apps/StorytellingTextLegend/index.html?appid=431bbae8faac418b87bb4ef3d7b66644

Fire Ant Biology

- Must know the biology of your insect to know how to manage it
- Most don't use baits because they do not understand fire ant biology and how baits work

Colony Establishment

- Mating flights by alates
- 24 -48 hrs after rain
- Newly mated queen, most vulnerable fire ant form:
  - environment
  - poor judgment (pools, etc.)
  - predators

Colony Establishment

- New colony founded by single female
- Removes wings, burrows 2-6 in, seals burrow
- Lays 10-20 eggs, hatch 6-10 days

Colony Establishment

- After one month workers:
  - open mound
  - begin foraging
  - begin construction
- Queen production now several hundred eggs / day

- For the first 3 months, mound may not be visible
- Mounds “disappear” during drought or if disturbed
- Ants may not rebuild until there is new moisture, so difficult or hard to find.
- New mounds “appearing” after a rain were already there

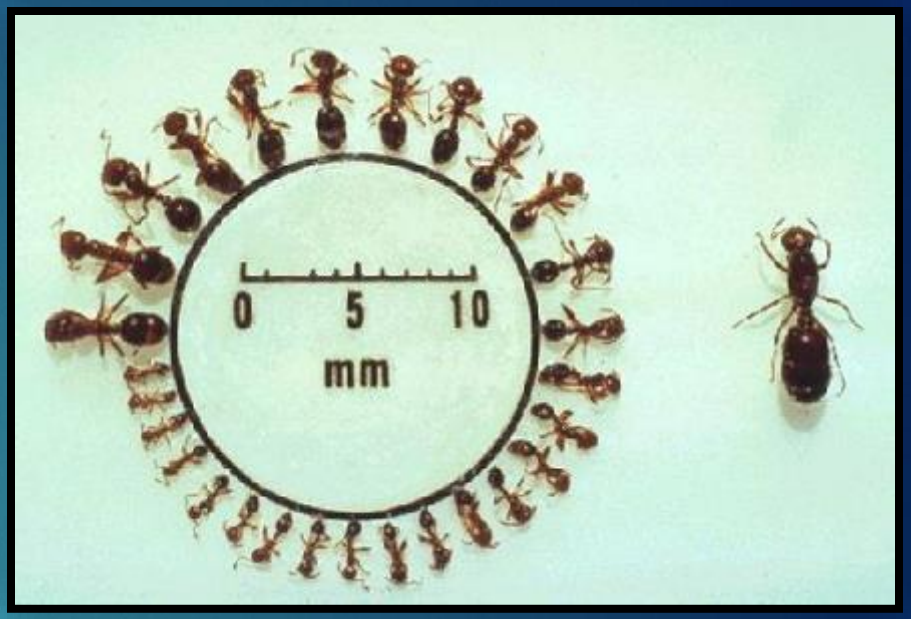
http://blog.al.com/birmingham-news-stories/2009/07/in_alabama_tiny_phorid_flies_m.html

- Below ground, a mature ant colony can encompass about 300 feet of underground tunnels
- The hilly mounds of dirt where fire ants make their home are actually solariums that collect heat to warm its residents in cool weather

Workers

- Workers range in size and have specific functions/duties

- Function depends on age & colony needs
  - Nurses
  - Reserves
  - Foragers



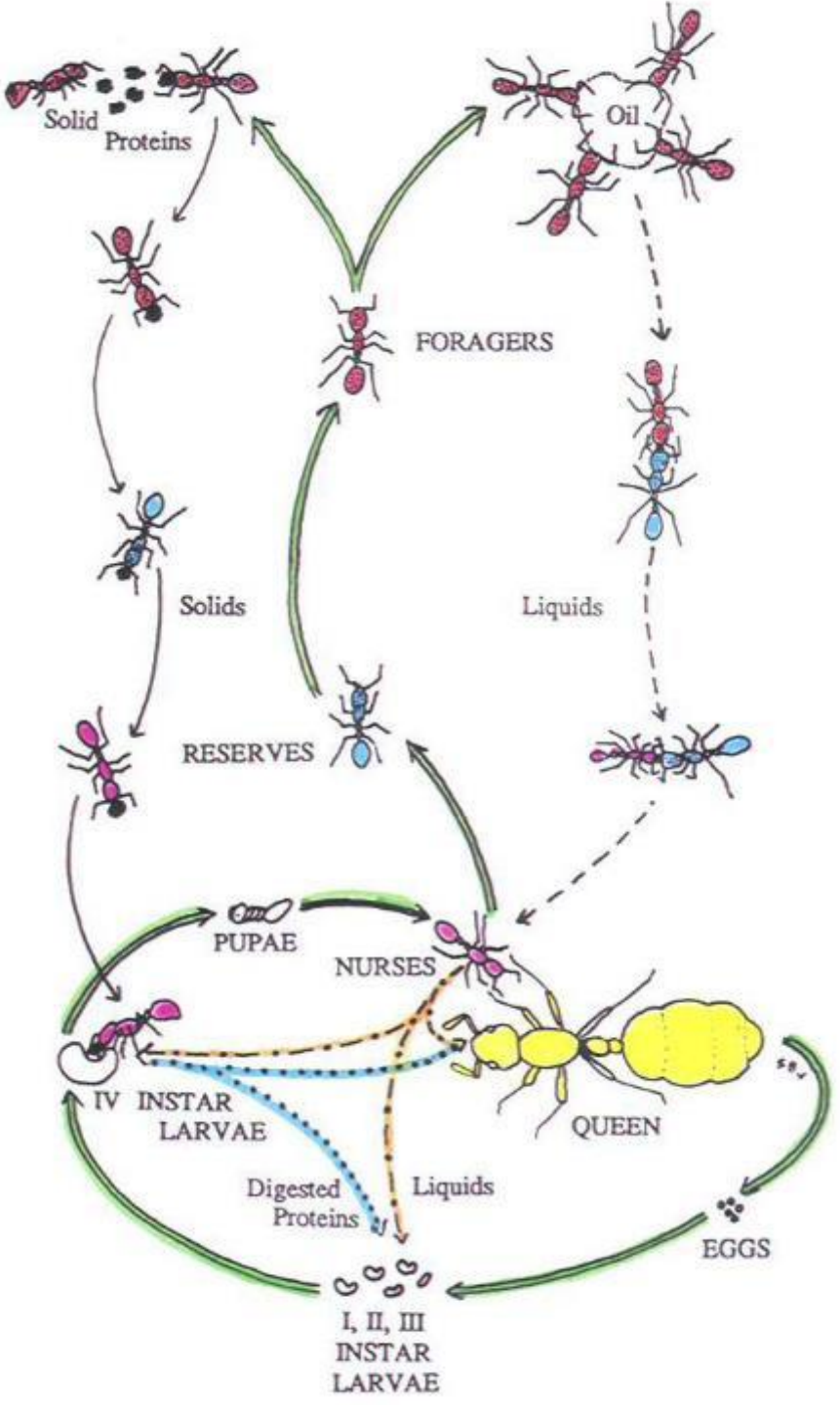
Development

- Complete Metamorphosis
- "White stuff"
- Egg to Adult 28-41 days
- Worker longevity
  - Small 60-90 days
  - Large 90-150 days

Liquid Food vs. Solid Food

- 4th instar larvae

Photo and drawing from Invasion of the Red Imported Fire Ant, Amer. Entomol., 1997



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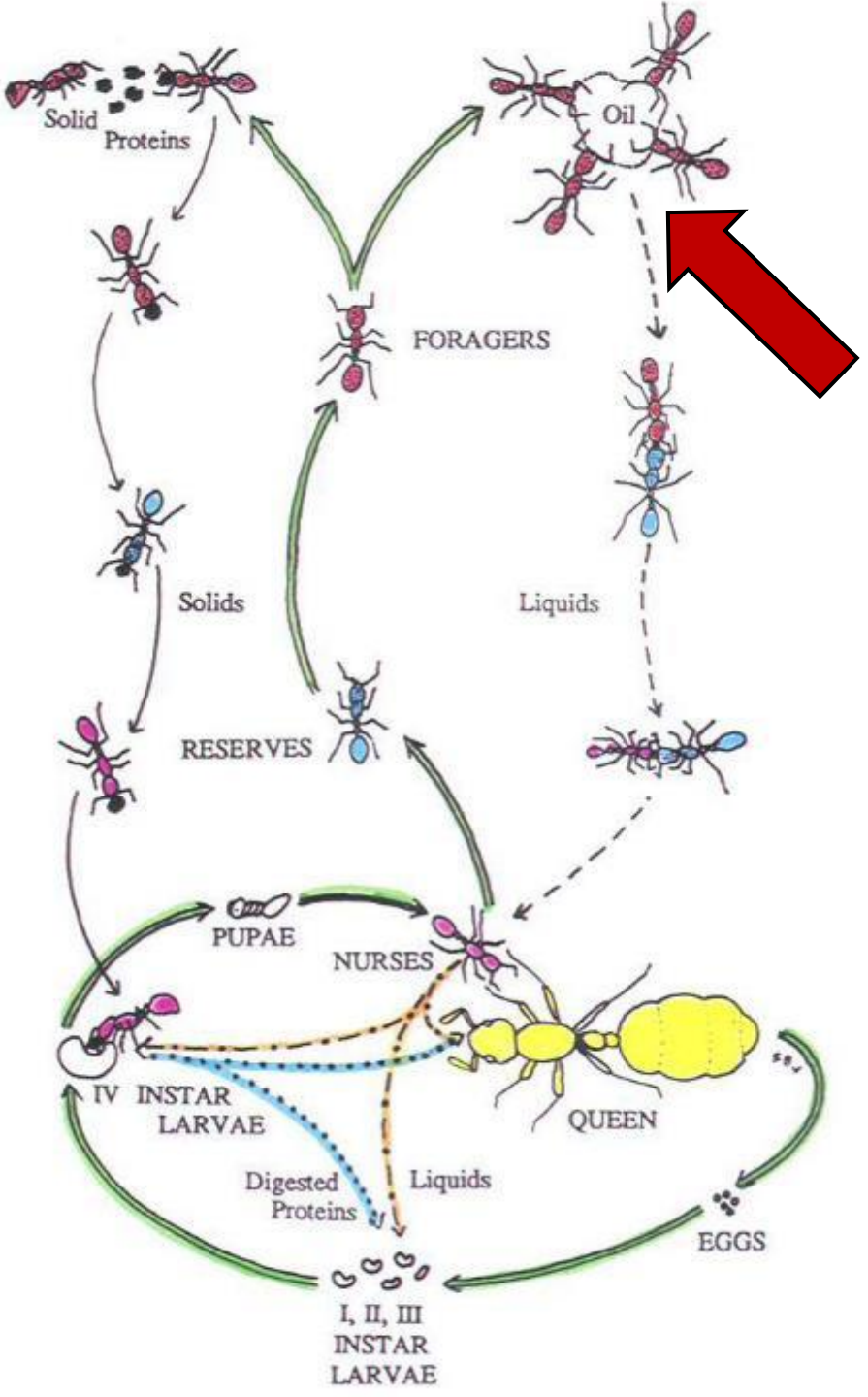

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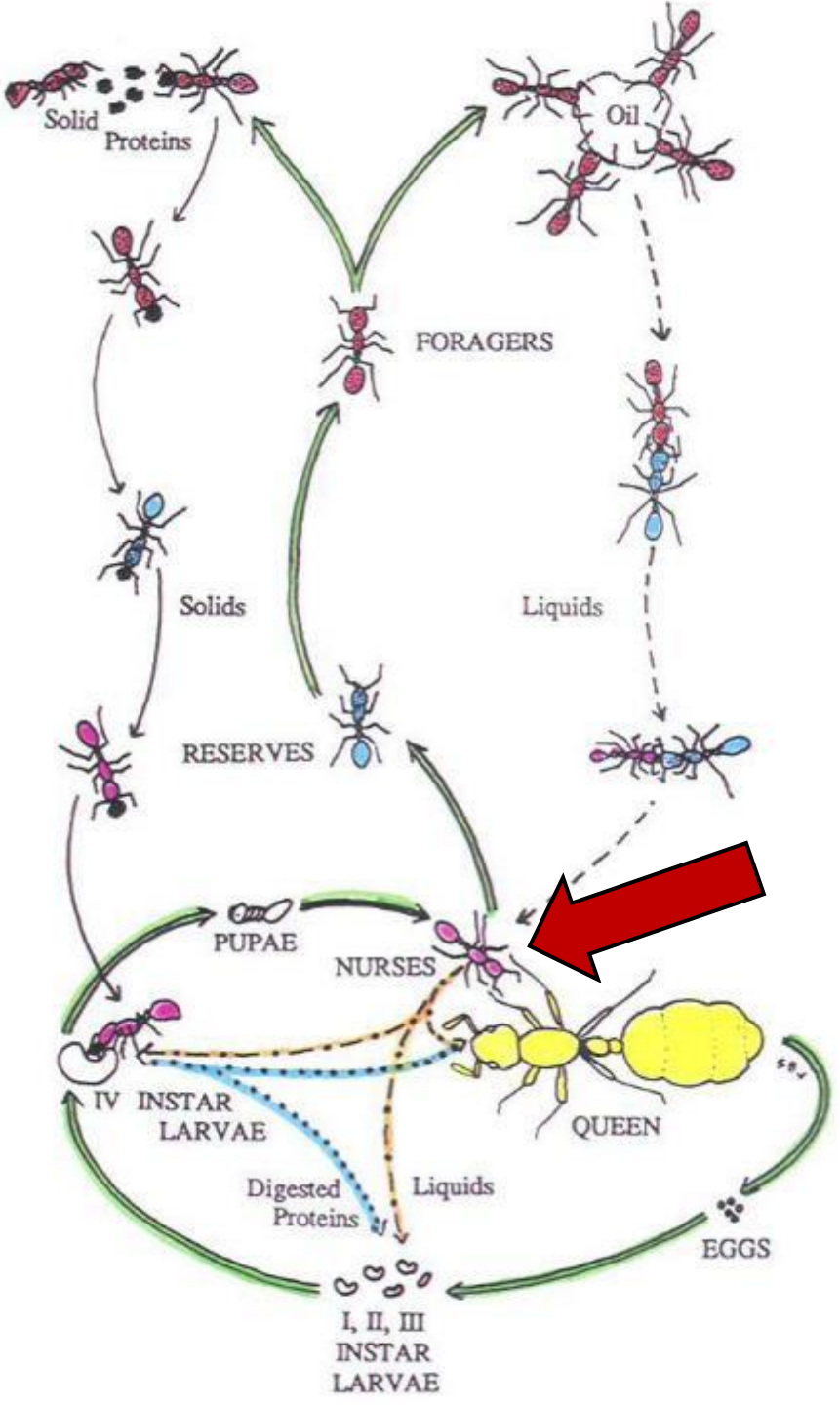

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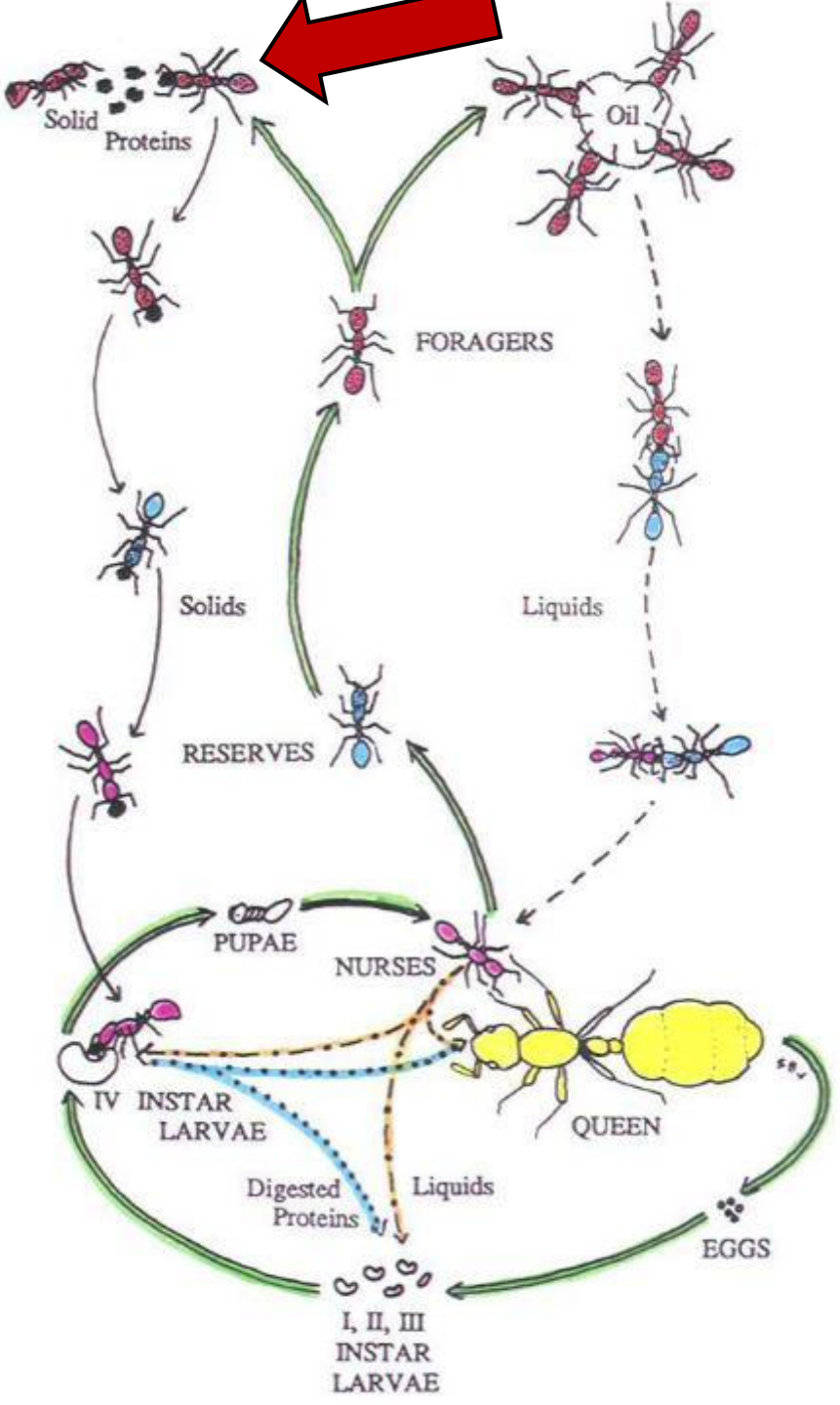

Liquid Food vs. Solid Food

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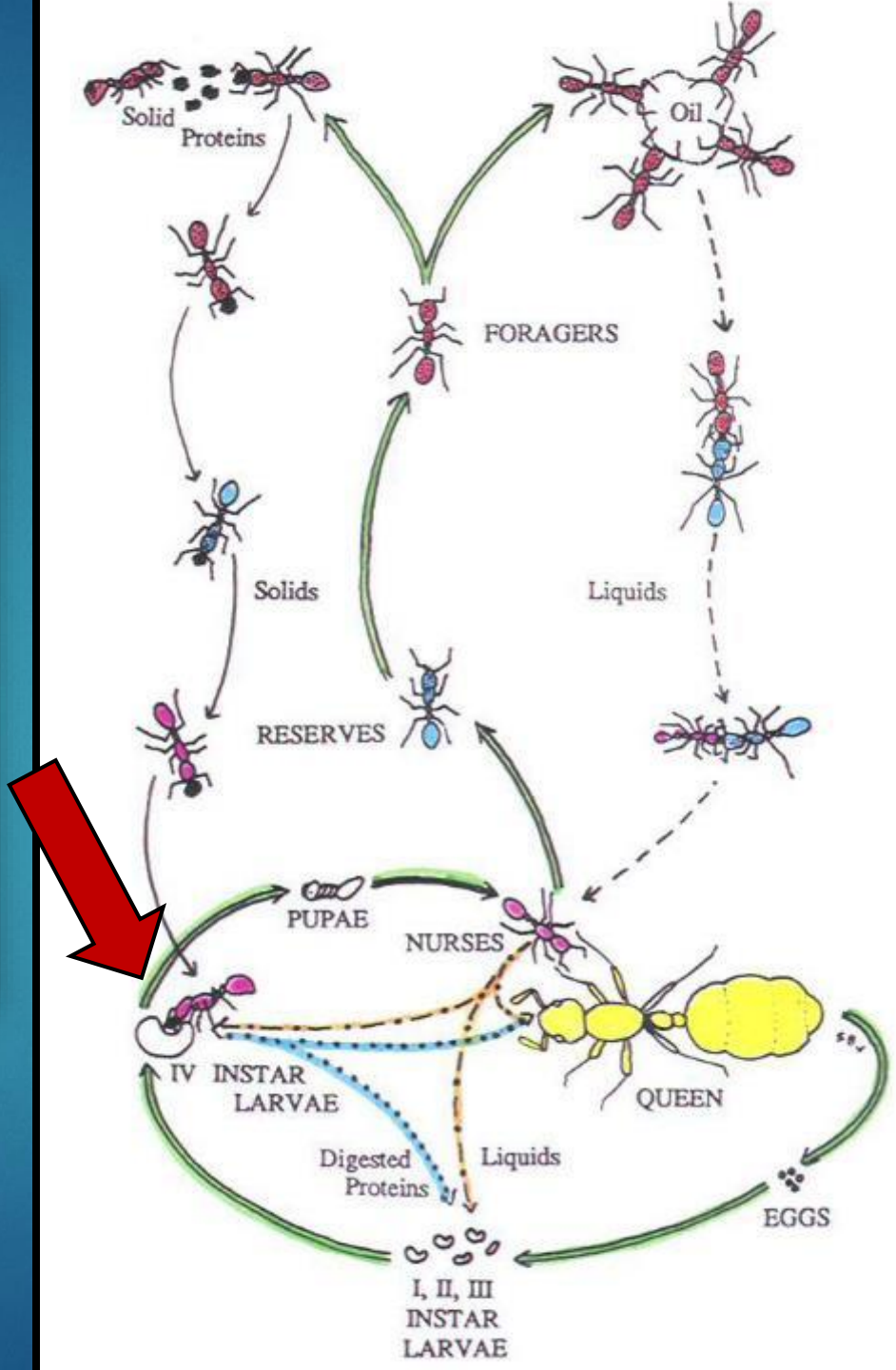


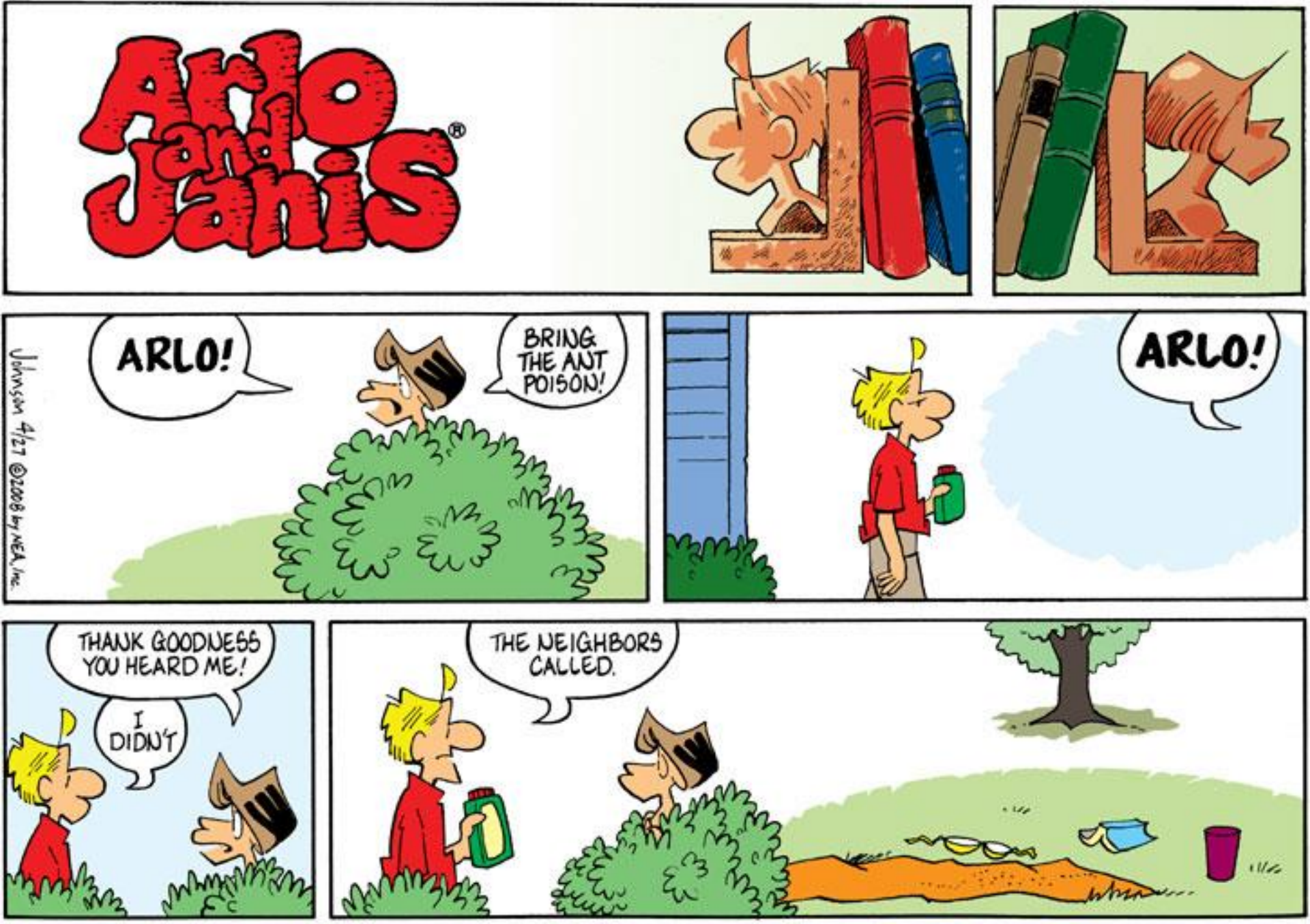
Photo and drawing from Invasion of the Red Imported Fire Ant, Amer. Entomol., 1997

Types of Fire Ant Management

Proactive

Reactive

Arlo and Janis®



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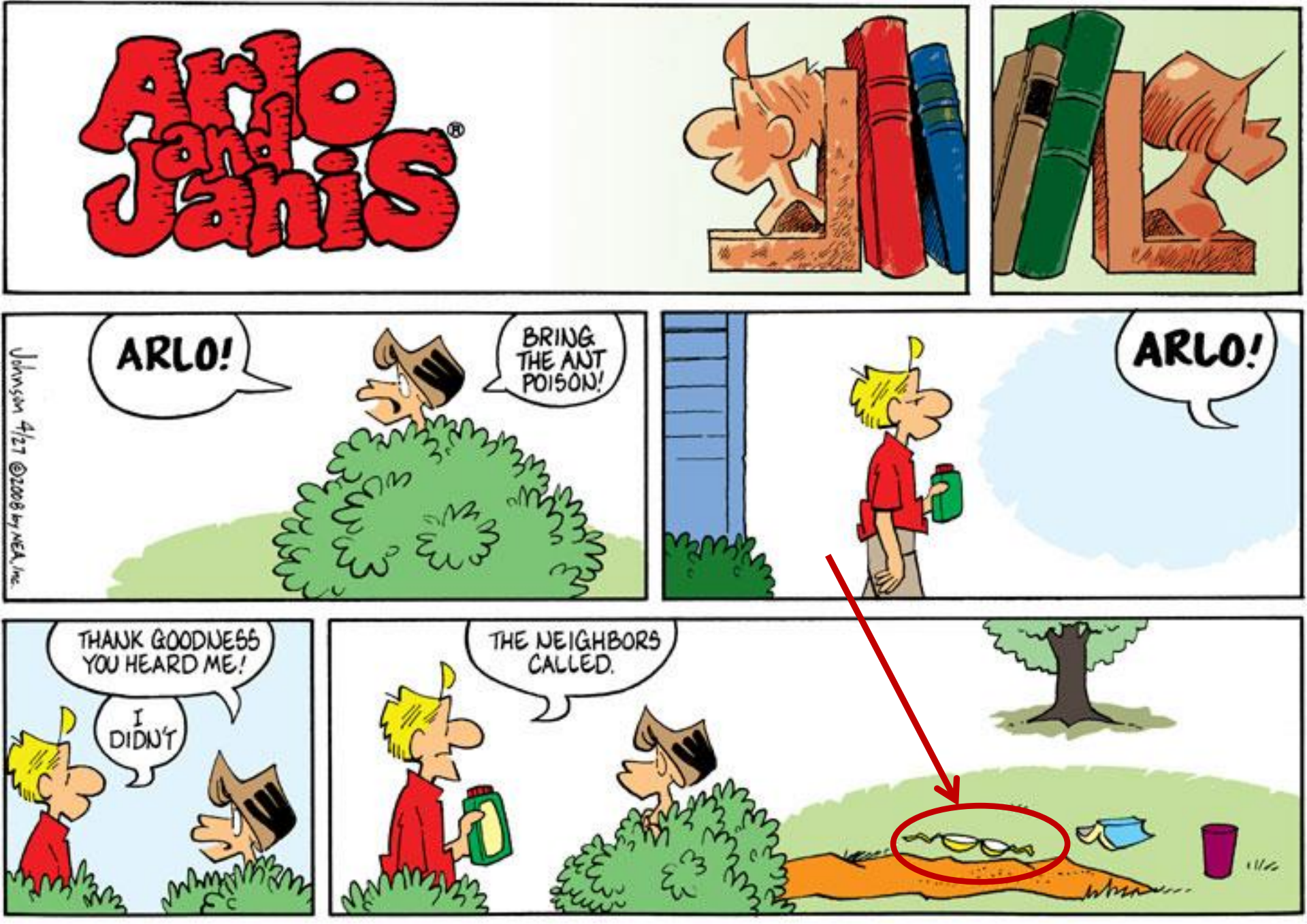

Arlo and Janis®
ARLO!
BRING THE ANT POISON!
Johnson 4/27 ©2008 by NEA, Inc.
ARLO!
THANK GOODNESS YOU HEARD ME!
I DIDN'T
THE NEIGHBORS CALLED.

© NEA, Inc.

Integrated Pest Management

- Management is site specific
- No single strategy is best for all situations
- Treat fire ants after spring mating flights
- Focus on gradual, rather than fast removal
- Slow acting baits give longer lasting control

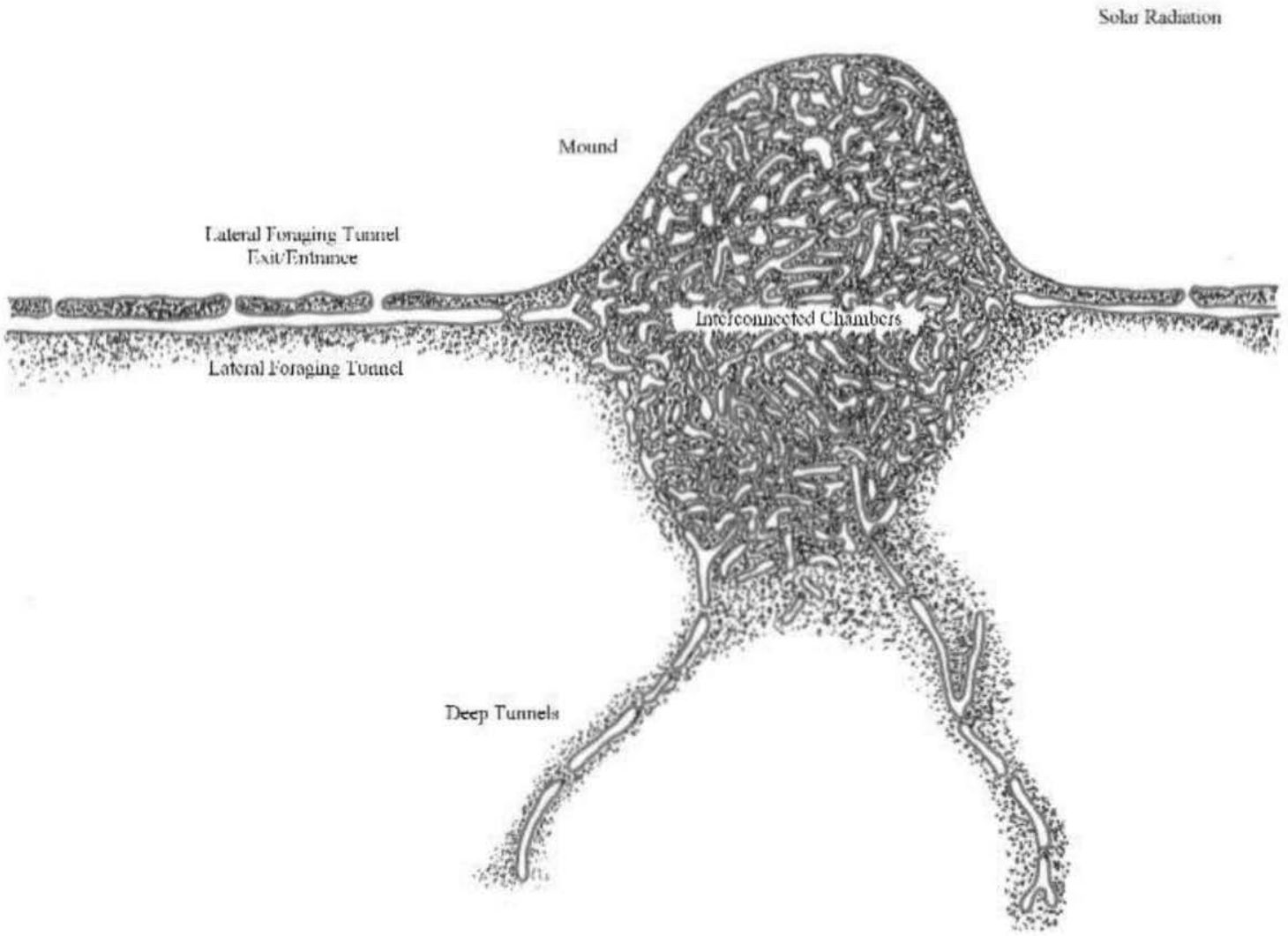
Fire Ant Control with Insecticides

- Fast-acting residual contact insecticides
  - Targeting foragers
  - Limited contact to colony and queen
  - Residual activity depends on rate, weather
  - Can be granular or liquid
- Baits
  - Targets colony and queen
  - Take longer to kill colony
  - Have bioresidual effect
- Slow acting baits give longer lasting control

Fast-acting, residual contact insecticides Individual Mound Treatments (granular and liquid)

- Advantages
  - Speed of Control
    - Generally fast acting
  - Ease of Use
  - Minimize residues
- Disadvantages
  - Number of Mounds
    - Time to search & treat
  - "Invisible" colonies
    - Young, hot-dry, tall grass
  - Access to entire mound
  - Hauling liquid/mixing
  - Not as effective in hot weather

Photo by Vicky Bertagnolli



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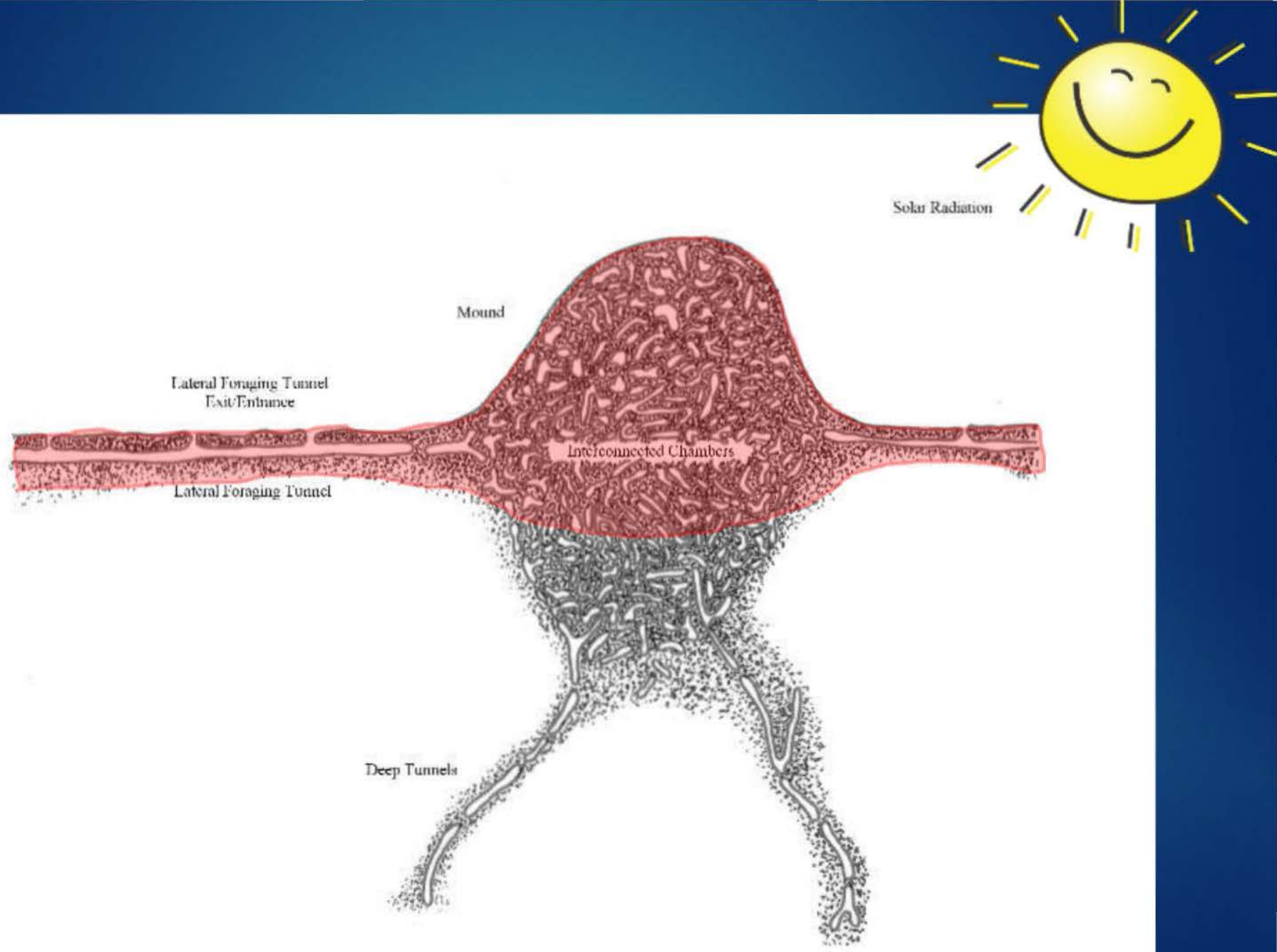

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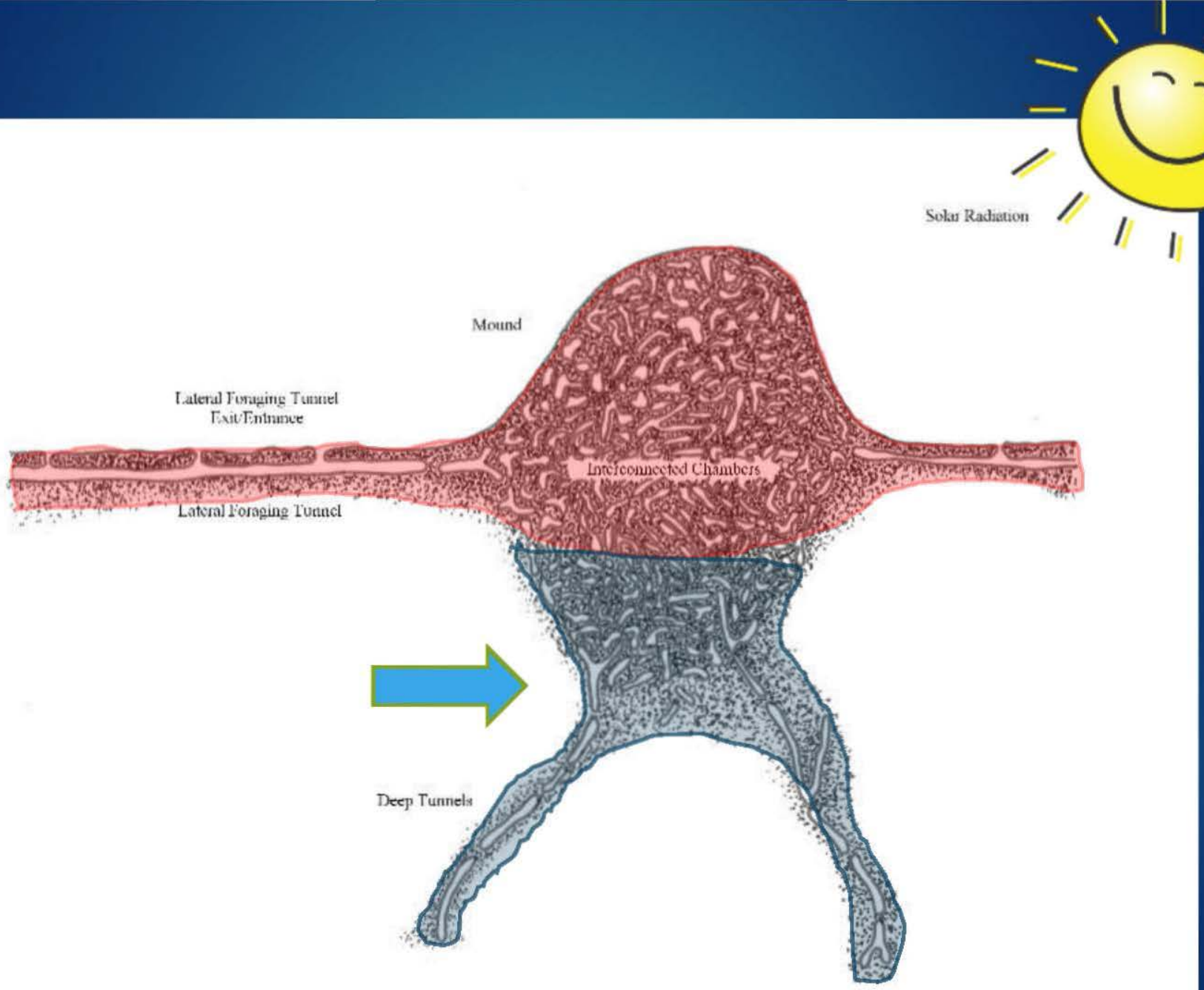

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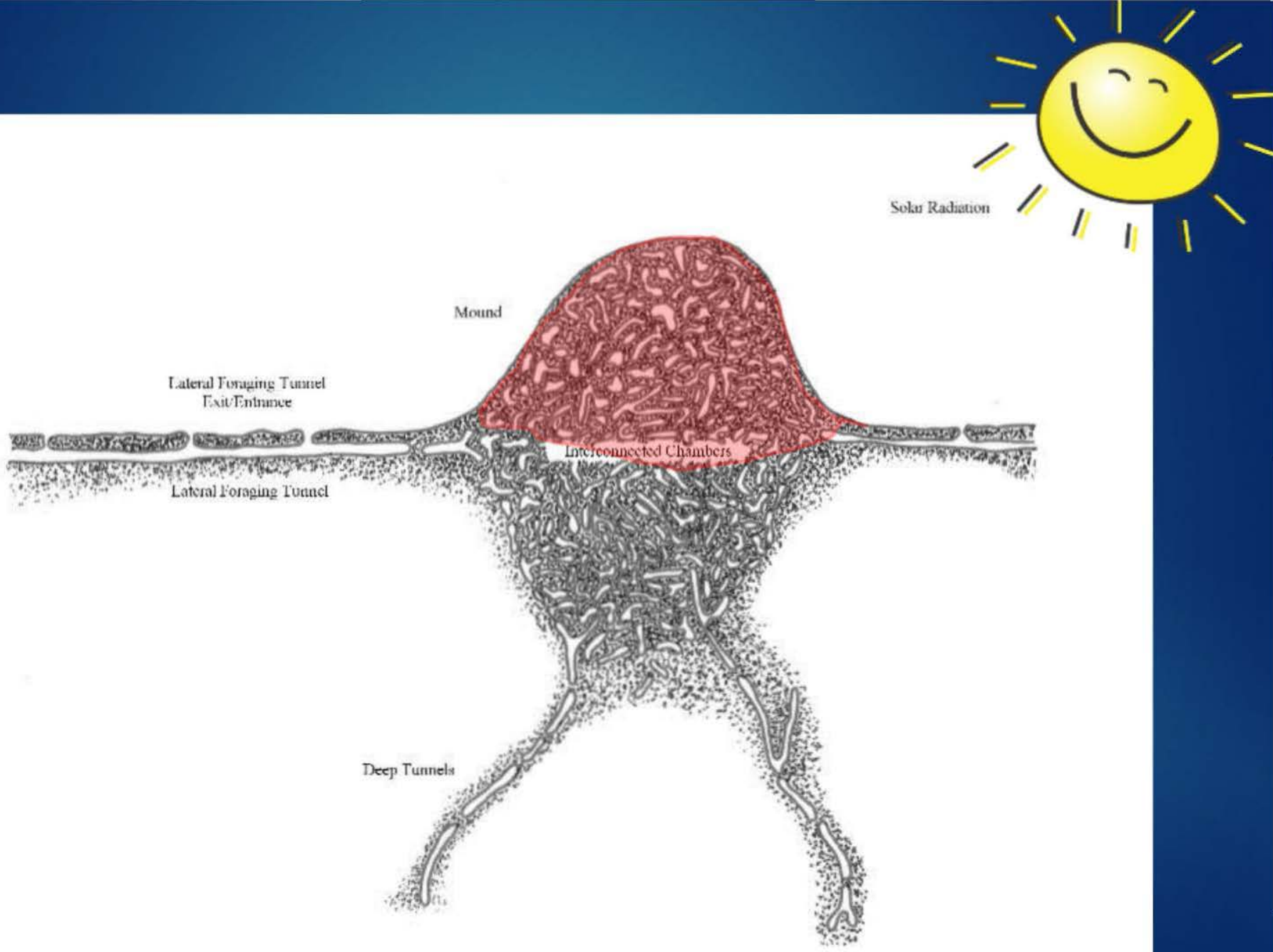


Photo from Invasion of the Red Imported Fire Ant, Amer. Entomol., 1997

Fast-acting, residual contact insecticides Broadcast (granular and liquid)

- Advantages
  - Slows re-reinfestation for a month or so (dependent on rate & activity of residual)
  - Usually, rapid colony control

- Disadvantages
  - Complete coverage of area
  - May need to be watered in
  - Residues in sensitive areas
  - Most are non-selective
  - Faster reinfestation once residue dissipates

Fire Ant Baiting

- Advantages
  - Utilizes natural behavior of ants to distribute toxicant to colony
  - Efficient to apply
  - Small amount of insecticide/growth regulator used
  - Low cost
  - Active ingredient carried to mound by ants
  - Little or no residue
- Disadvantages
  - Timing application to foraging behavior, can be inconvenient
  - Colony control requires 1 to 8 weeks
  - Difficult to apply at low rates without proper equipment

What is a fire ant bait?

What is a fire ant bait?

Carrier

What is a fire ant bait?

Carrier + Attractant

+

What is a fire ant bait?

Carrier + Attractant + A.I.

+

+

What is a fire ant bait?

Carrier + Attractant + A.I. = Bait

+

+

=

Must make sure that the label says Fire Ant Bait!

Metabolic/Nervous System Inhibiting AIs in Baits

- Hydramethylnon: 1 - 4 weeks
  - Amdro®, Amdro Pro®, MaxForce® Complete Granular Insect Bait
- Spinosad: 3 days - 2 weeks
  - Greenlight® Fire Ant Control with Conserve, Fertilome® Come and Get It, Payback® Fire Ant Bait
- Abamectin: 1 - 4 weeks
  - Award II®, Ascend®
- Fipronil: 2 - 4 weeks
  - Maxforce® FC Fire Ant Bait

http://www.extension.org/pages/68606/the-latest-broadcast-on-fire-ant-control-products#.VPSXU2B0yEk

Metabolic/Nervous System Inhibiting AIs in Baits

- Indoxacarb: 2 - 5 days
  - Advion®
- Metaflumazone: 3 - 14 days
  - Siesta®

http://www.extension.org/pages/68606/the-latest-broadcast-on-fire-ant-control-products#.VPSXU2B0yEk

Growth Regulators

- Pyriproxifen: 4 - 8 weeks
  - Distance®
- Methoprene: 8 - 12 weeks
  - Extinguish®

http://www.extension.org/pages/68606/the-latest-broadcast-on-fire-ant-control-products#.VPSXU2B0yEk

Product mixture

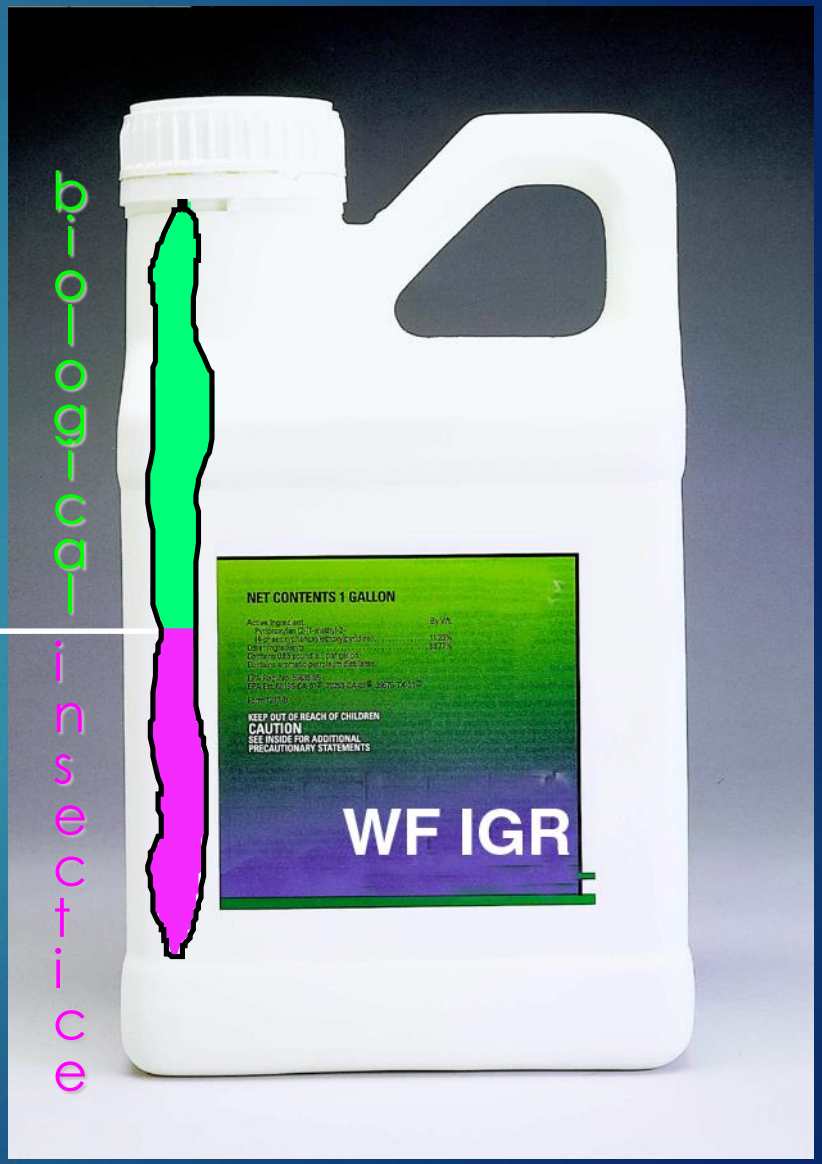
- Methoprene and Hydramethylnon
  - Extinguish Plus®, Amdro Firestrike® Mound Treatment
    - 2 - 4 weeks
    - plus extended control (bioresidual)

http://www.extension.org/pages/68606/the-latest-broadcast-on-fire-ant-control-products#.VPSXU2B0yEk

What is "Bioresidual"?

Overall killing power of an insect control technology including the direct effects of the technology (i.e., chemical residual) **PLUS** the associated natural biological mortality.

Ellsworth & Martinez-Carrillo, 2001



Broadcasting Bait

MARENGO CO.
Herd
SURE-FEED
BROADCASTER

Bait Application

- Apply at temperatures between 70° and 85° F
- Applications made during the hot days of summer should be made late afternoon or early on a morning with no heavy dew.
- Do not apply if rain is expected within 4 - 12 hours
- Store bait in a cool dry place
- Do not store bait with pesticides, gasoline or other volatile chemicals
- Buy only what you will use each year – bait will go rancid

Bait Application

- Broadcast only during warmer months
  - April 15 - October 15
- Can do individual mound treatments year round, but only on warmer days during the winter months
- Can mix with fertilizer if application is made immediately after mixing

Why aren't baits used more?

- Want immediate control - yesterday
- Don't understand how they work
- Confused with granular insecticides
- Difficult to apply at label rates without proper equipment
- Application timing can be inconvenient

So, why should I use baits?

- Safe products
- Low amount of active ingredient used
- Fire ants do the work for you
- Utilize natural behavior of ants to distribute toxicant to colony
- Kill the queen in addition to the workers
- Inexpensive
- Relatively no residual
- Slow kill results in slower reinfestation

Questions

grahalc@auburn.edu

http://www.extension.org/fire_ants

Carpenter Ant Biology and Baiting

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Department of Entomology
Griffin, GA 30223-1797

770-233-6114; dsuiter@uga.edu

gabugs.uga.edu

Photo: Susan Ellis at Bugwood.com

Important Aspects of Carpenter Ant Biology

Photo: David Cappaert at Bugwood.com

Black Carpenter Ant

Camponotus pennsylvanicus

- Chews wood, but does not eat it (sawdust)
- Outdoors, nests in trees; create permanent trails
- Active at night
- Control
  - Find colony or most likely site; provide gel or granular bait

Carpenter Ant Damage

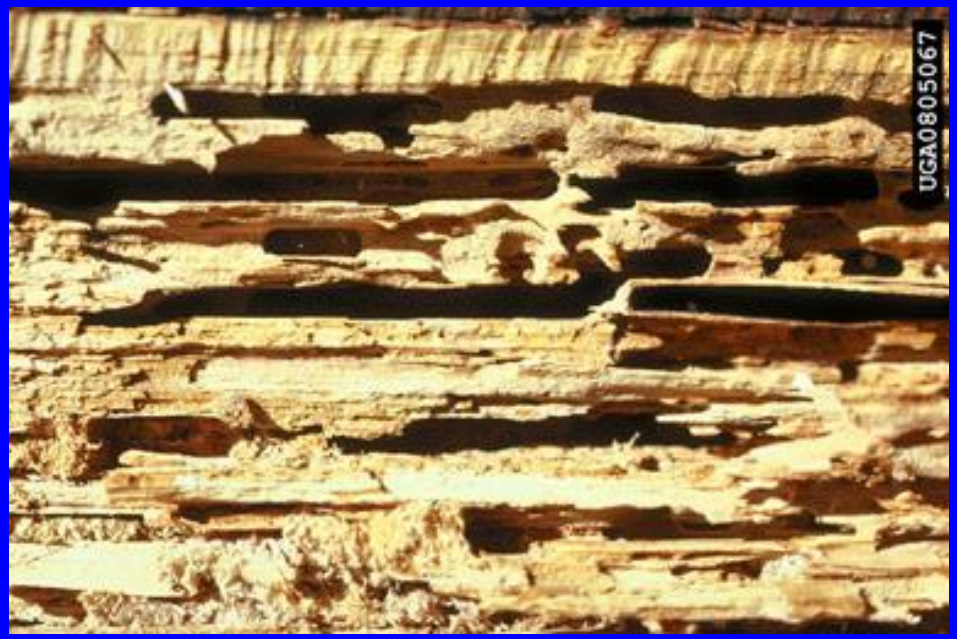
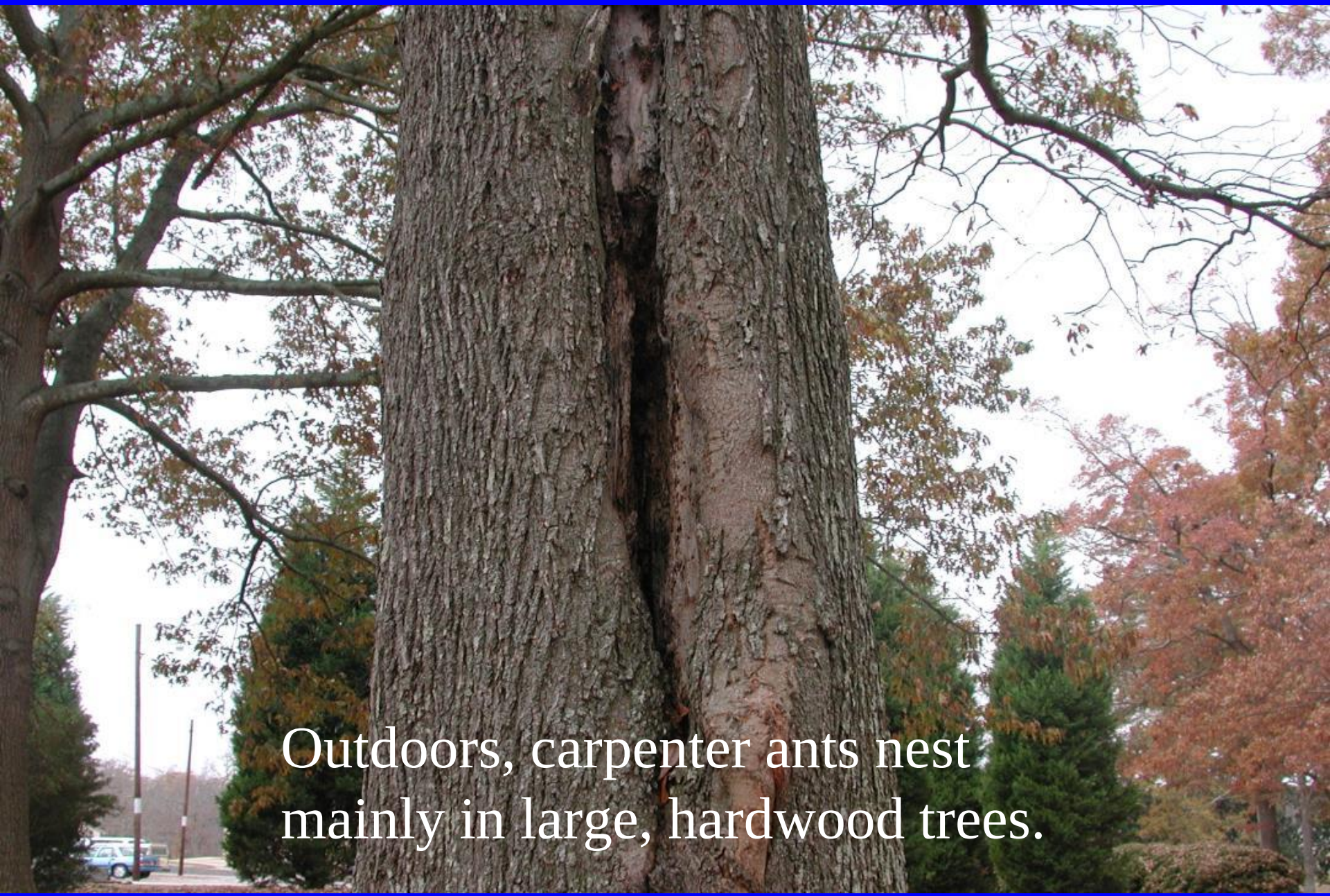
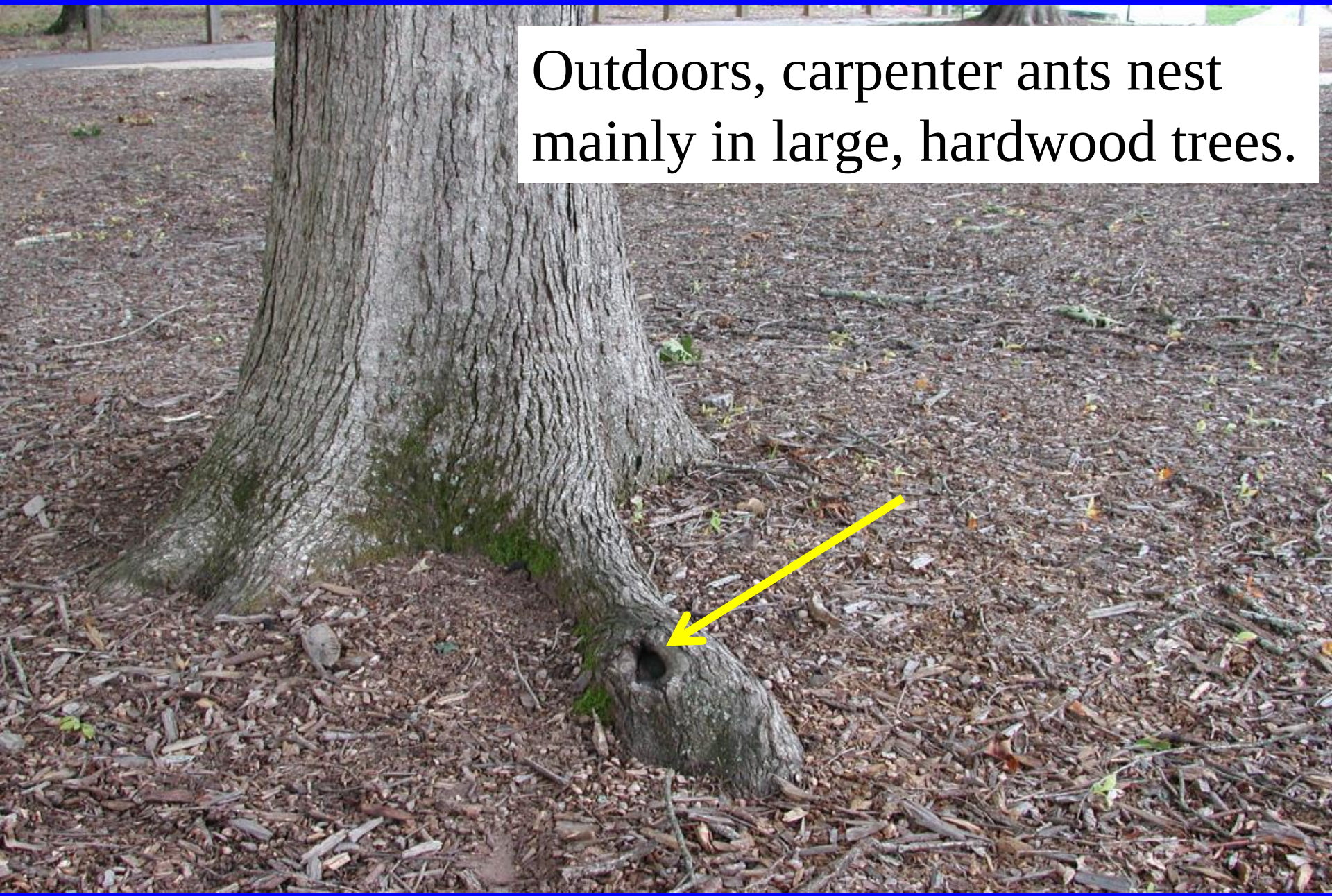


Photo above: R. Werner at Bugwood.com; right: Art Cushman at Bugwood.com

“Sawdust” from nest cleaning


Outdoors, carpenter ants nest
mainly in large, hardwood trees.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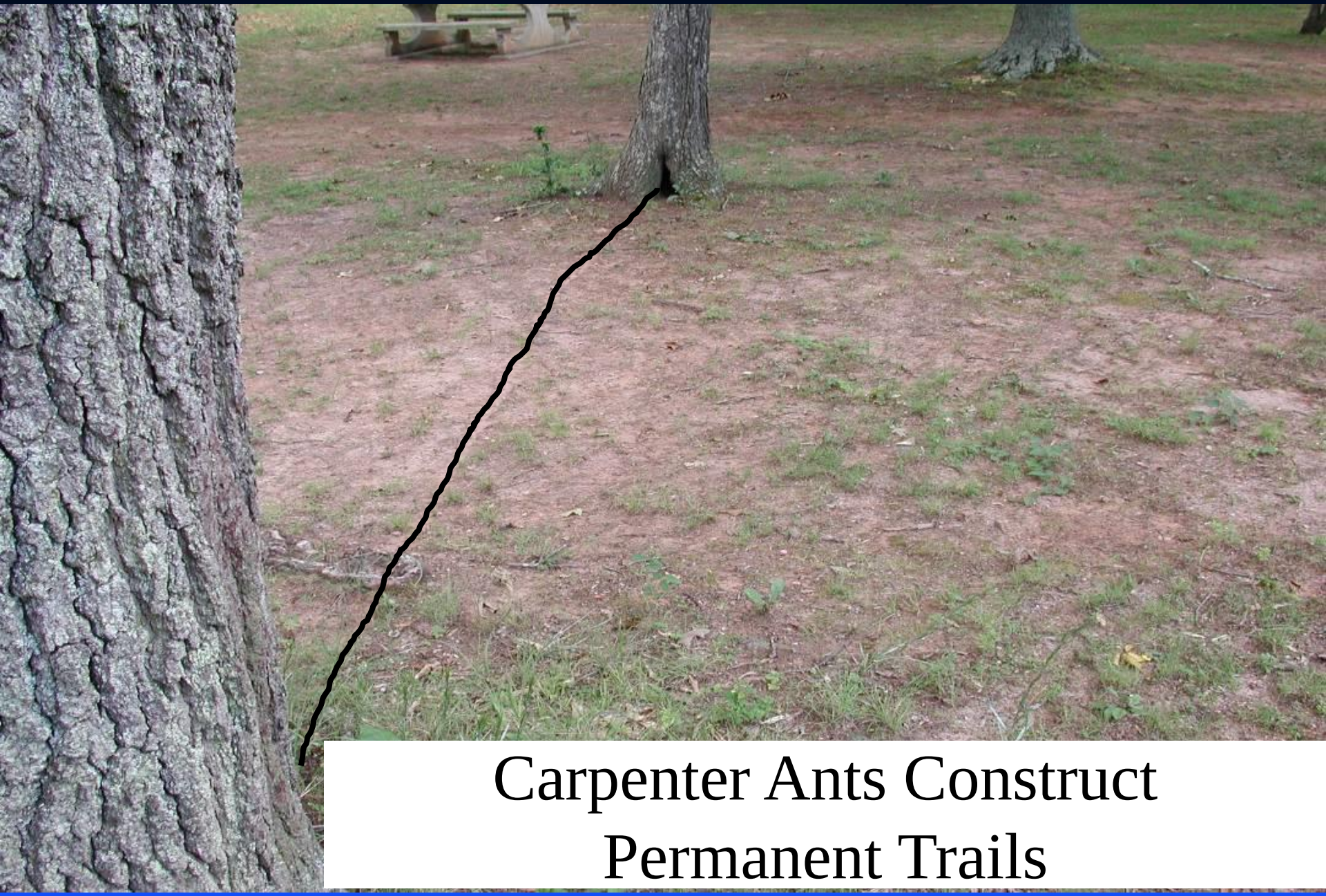
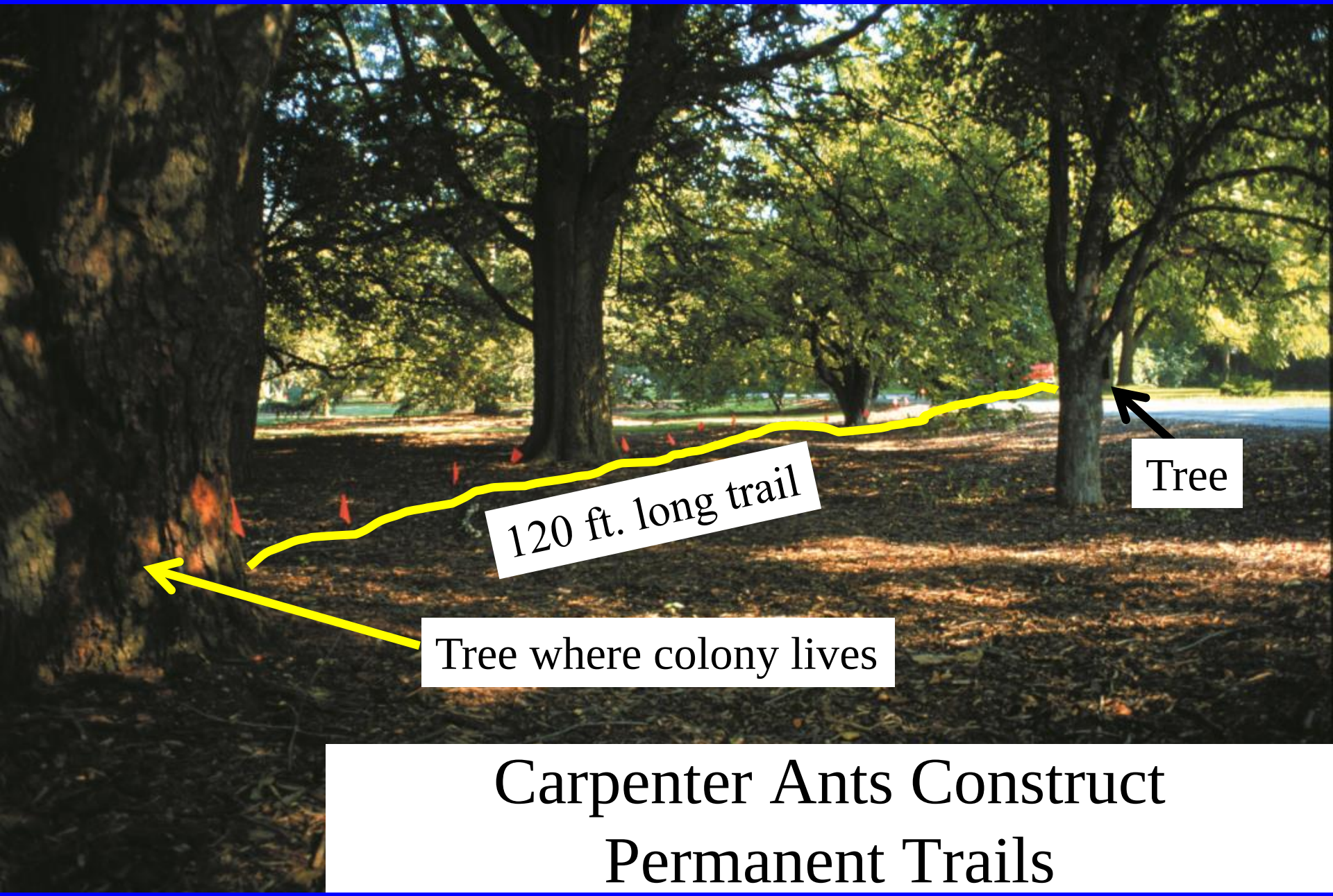
Carpenter Ants Construct Permanent Trails

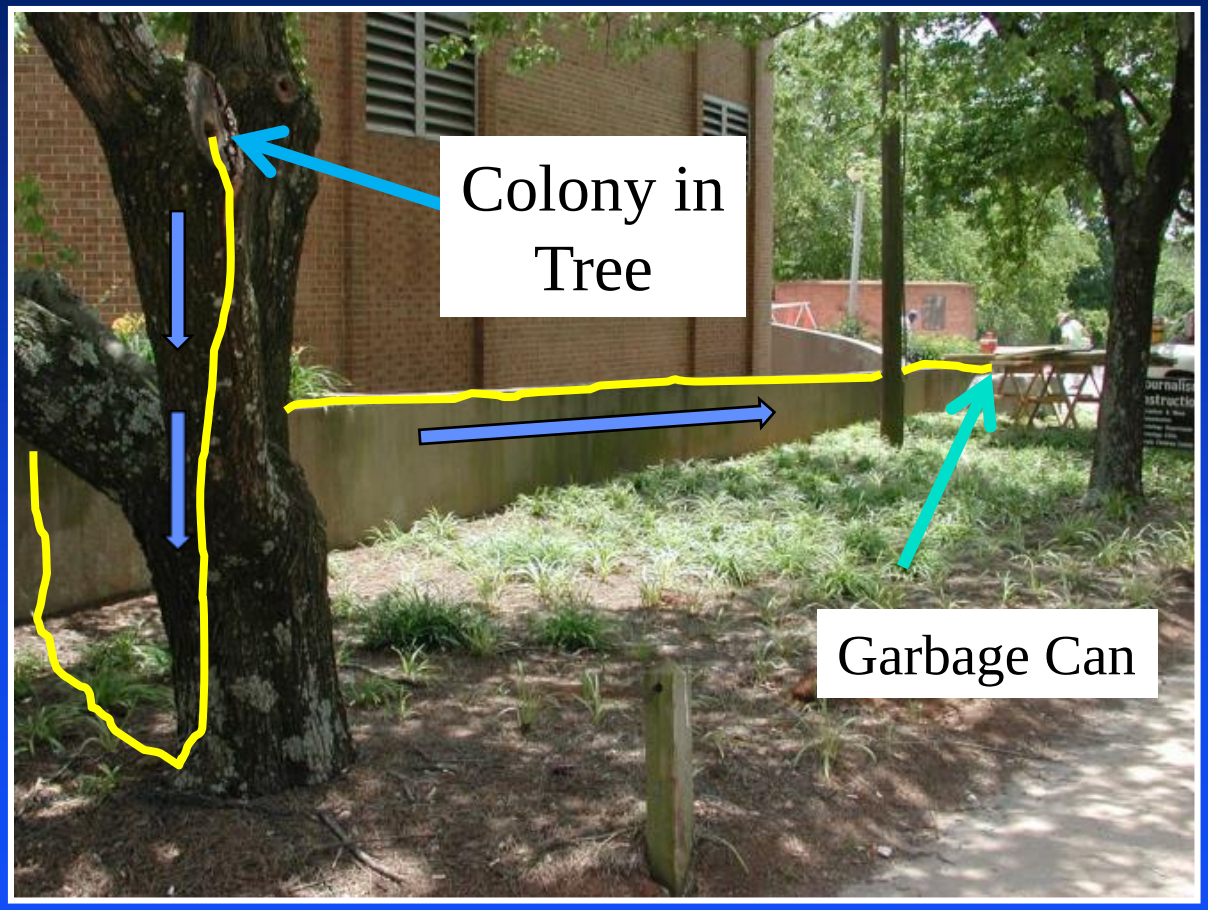


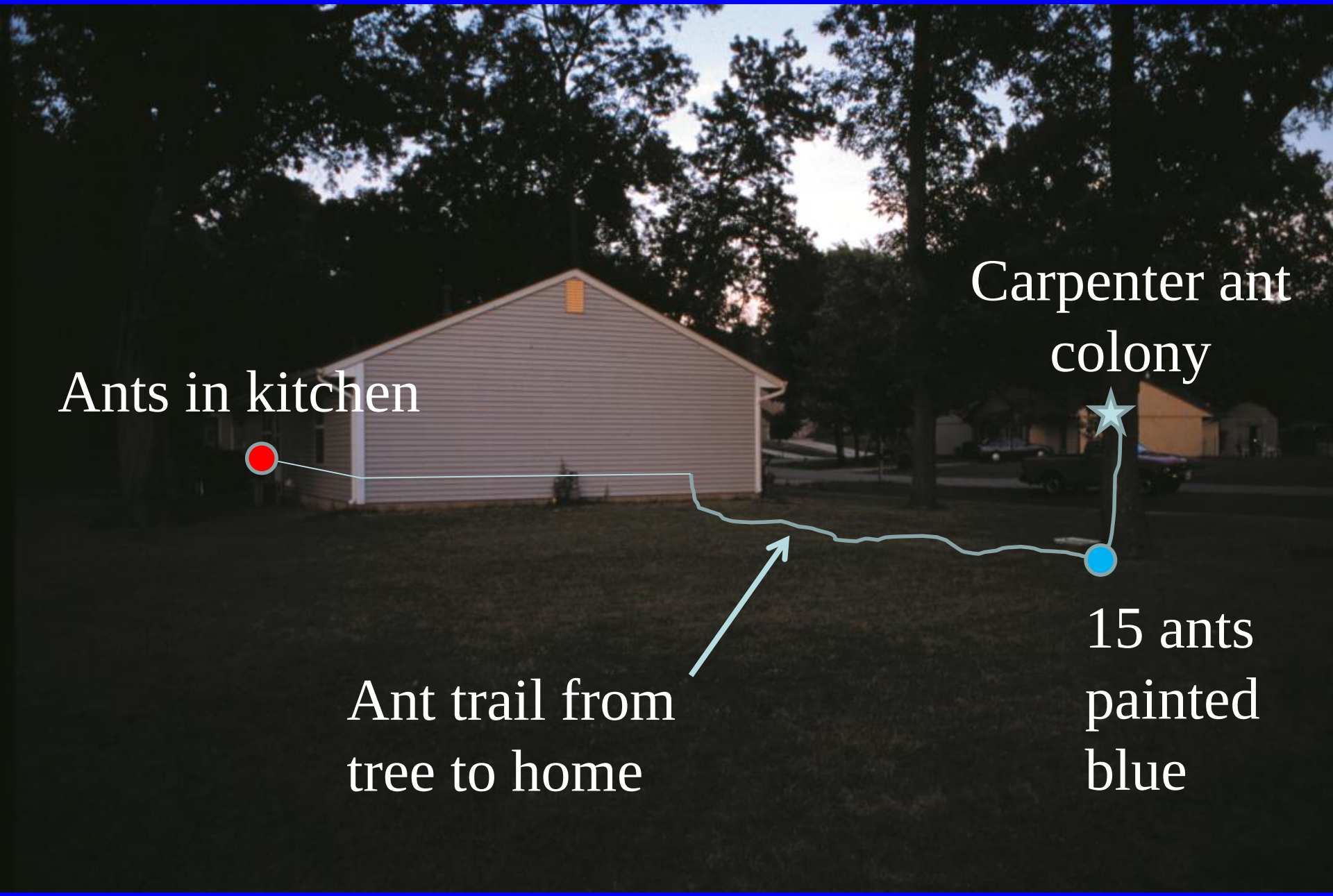
Carpenter Ants Construct Permanent Trails



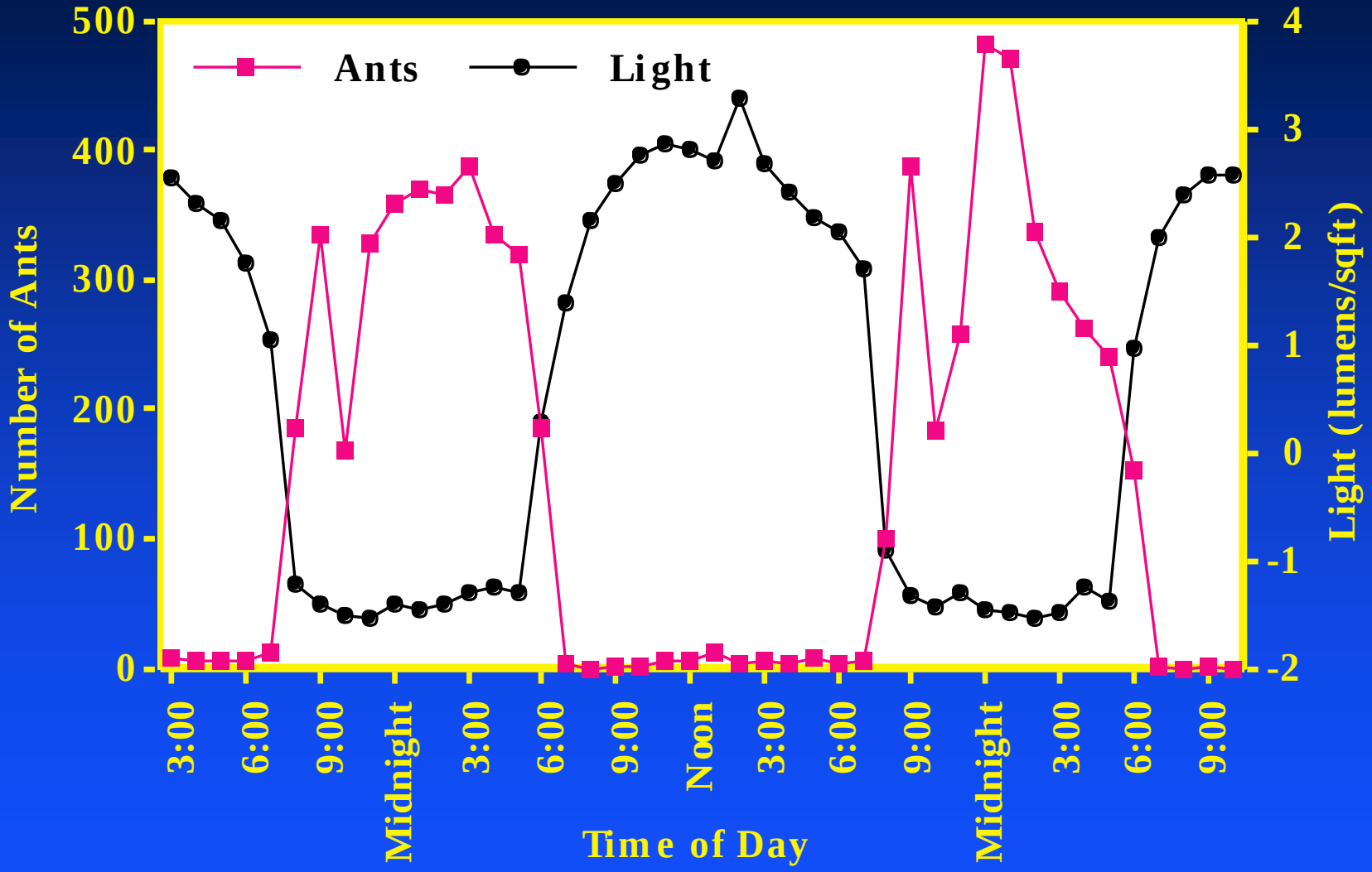
Carpenter Ants Construct Permanent Trails

Carpenter Ants Follow Structural Guidelines



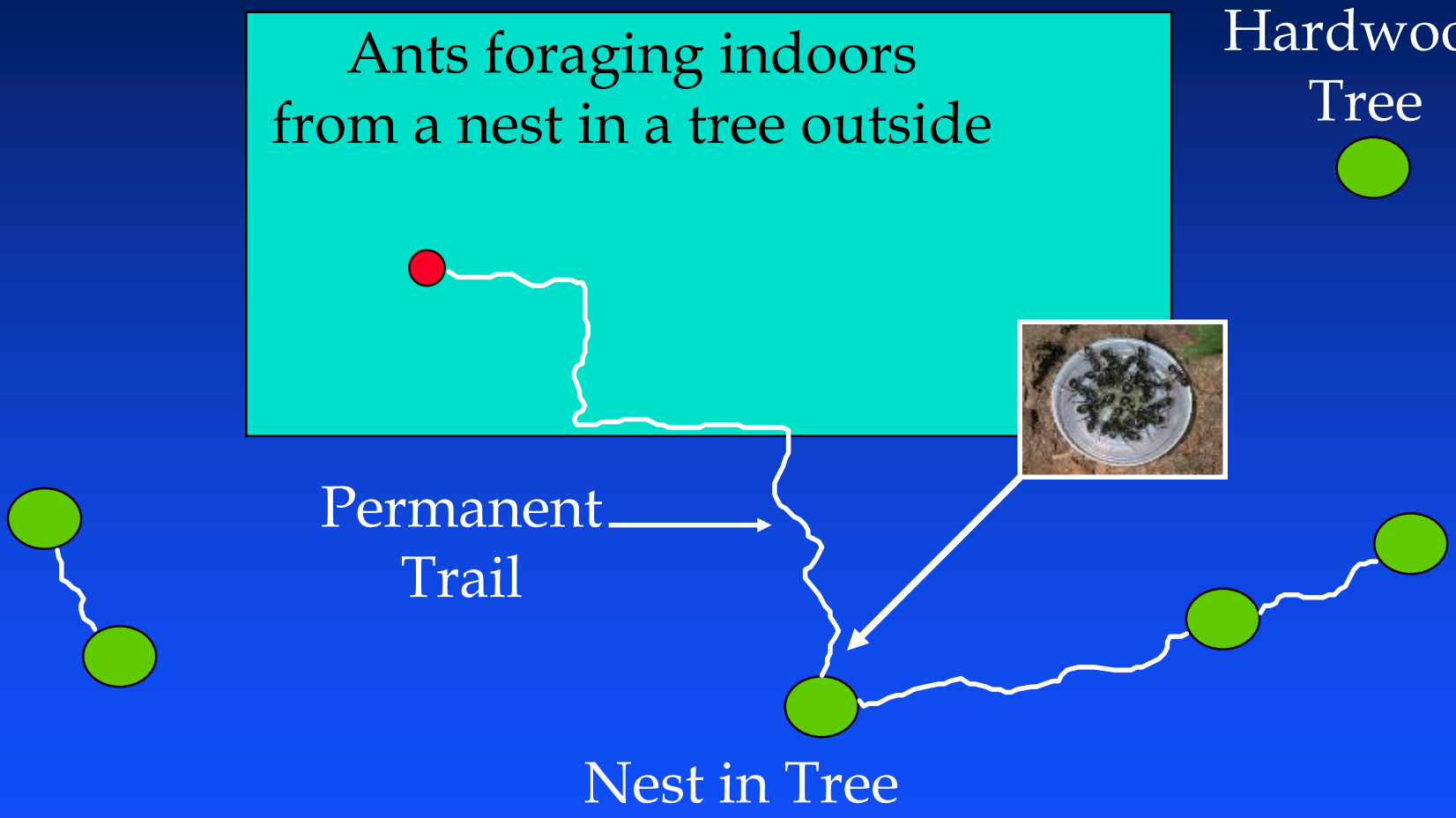

Carpenter ant colony
Ants in kitchen
15 ants painted blue
Ant trail from tree to home

Carpenter Ants Forage Mainly at Night



Carpenter Ant Baiting

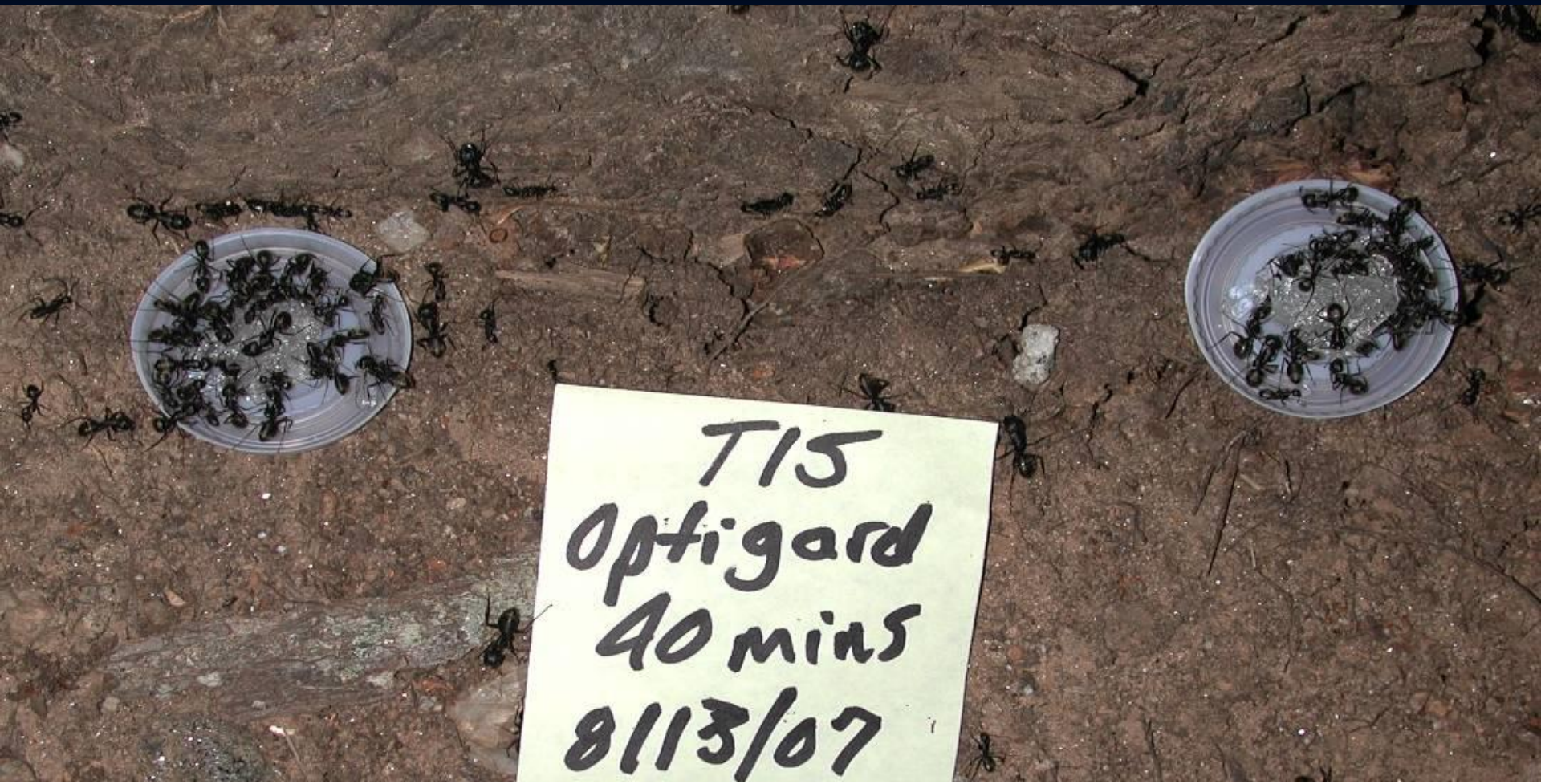
Deliver Granular & Gel Baits from Piles ON TRAILS or Where Ants are Seen



Carpenter Ant Baitings

Advion Ant Bait Gel (0.05% indoxacarb)

Advion Carpenter Ant Bait Gel
(0.05% indoxacarb)



Carpenter Ant Baitings

Optigard Ant Bait Gel (0.01% thiamethoxam)

Optigard Carpenter Ant Bait Gel
(0.01% thiamethoxam)

Carpenter Ant Baitings

Borate Bait #1

Carpenter Ant Baitings

Borate Bait #2

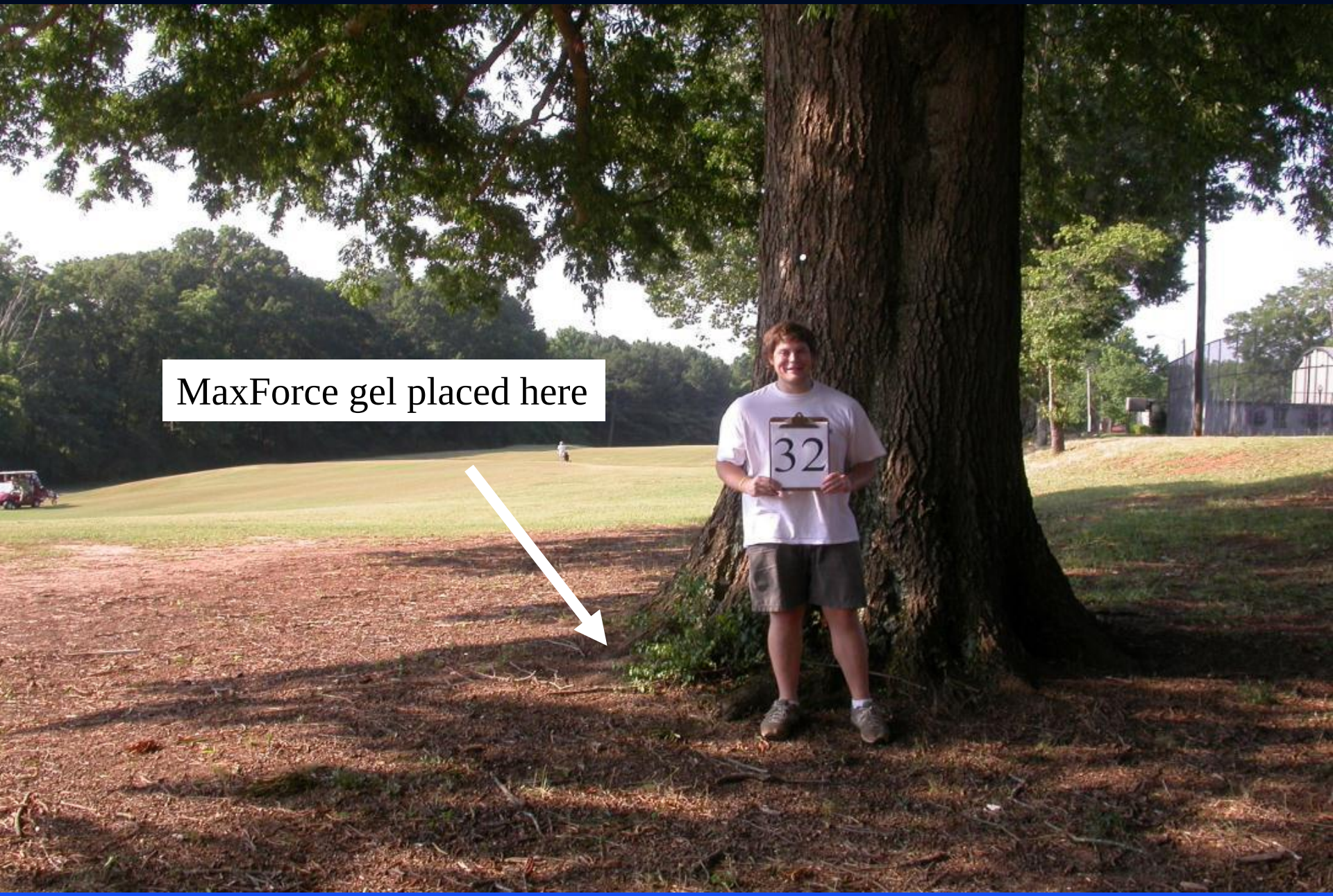
Borate
Bait
Colony 1
Year 1

Carpenter Ant Baitings

MaxForce Carpenter Ant Bait Gel (0.001% fipronil)

MaxForce Carpenter Ant Bait Gel
(0.001% fipronil)

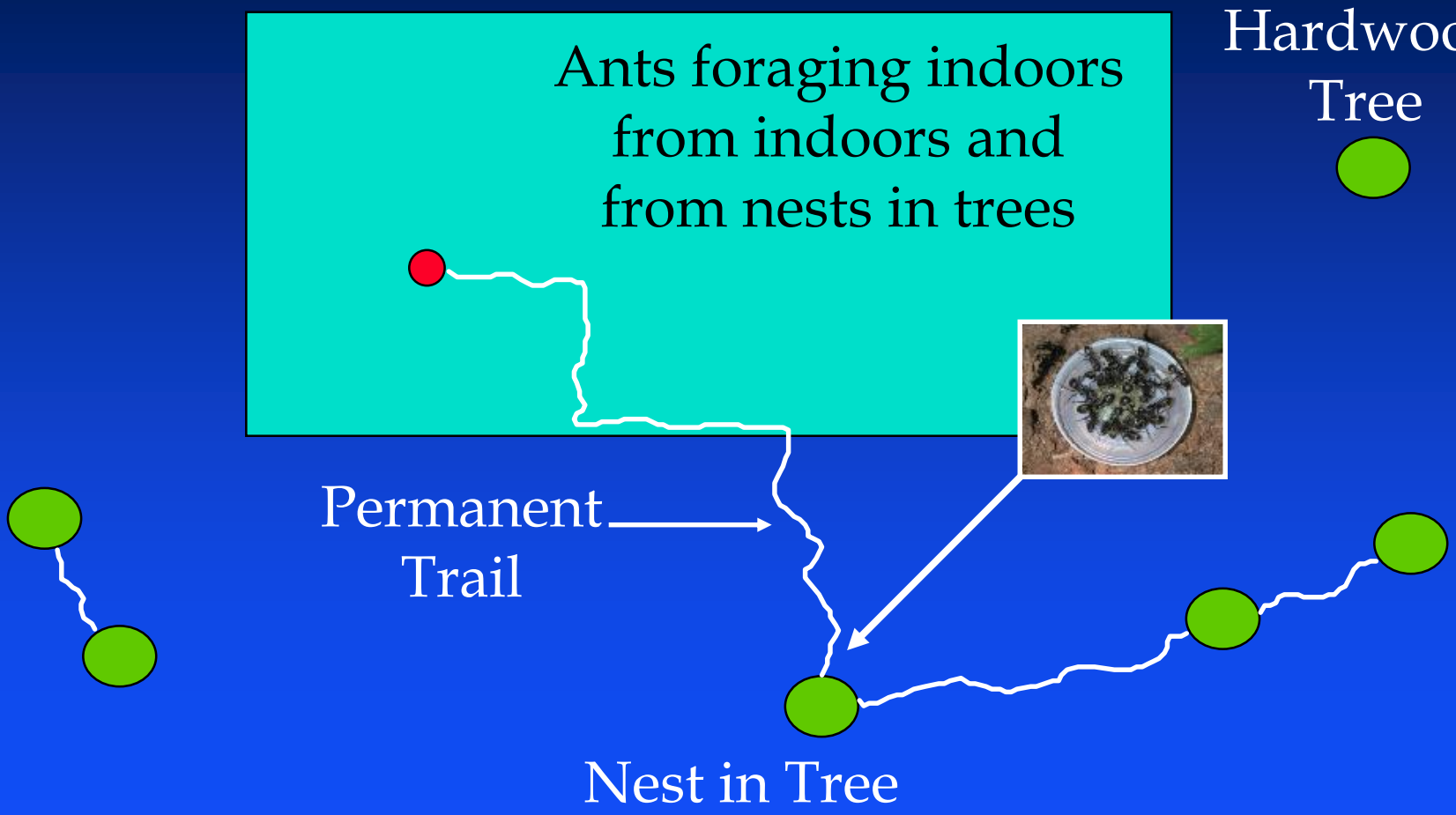
T25
D-MF Carp. Ant Gel
July 8, 2011
30-40 mins


MaxForce gel placed here
32

MaxForce Gel: Colony Baited July 8, 2011

1,000+ Dead Carpenter Ants

Deliver Granular & Gel Baits from Piles ON TRAILS or Where Ants are Seen in Day



Given The Quality of Today's Carpenter Ant Baits…

Photo: David Cappaert at Bugwood.com

…Elimination is Possible.

dsuiter@uga.edu
770-233-6114

Contact me anytime.

Ants are not TERRIFYING!

Frederick P. Remelius

Director of Operations

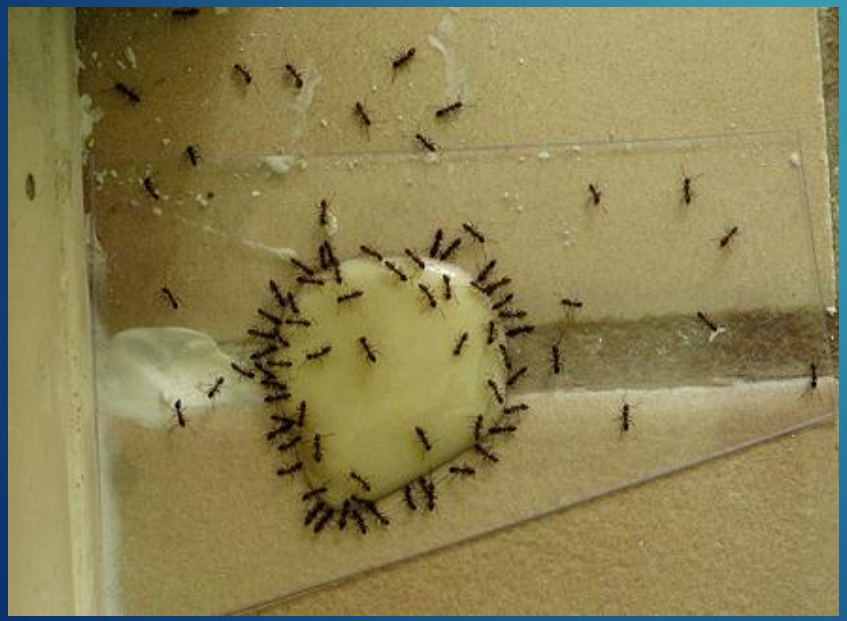
Upper Merion Area School District, King of Prussia, PA

There are lots of ant products on the store shelves and in TV advertisements, but…

GET REAL -
You are in Charge!

Don't freak out.

Be Prepared and be Responsible.



IF YOU FEED THEM, THEY WILL COME.

Ants are REALLY, REALY good at finding food!

Ants found food on the 3rd floor of our Middle School

That's like you climbing to the top of this hotel to find a hidden pizza!

Four Seasons Hotel Miami
64 stories tall

6 STEPS FOR A PEST-FREE OFFICE

Office buildings provide pests with an ideal environment offering everything they need – food, water, shelter and comfortable temperatures. Luckily, there are proactive steps that you can take to reduce pest pressures and eliminate hot spots.

1 CLEAN UP SPILLS AND MESSES

Regularly cleaning common areas like kitchens, lounges and conference rooms will remove crumbs that can attract pests from cockroaches to rodents.

2 CLEAR FOOD AND DRINKS ASAP

An old cup of coffee, leftover doughnuts and full trash cans are all open invitations to ants, flies and other bugs.

3 COVER AND SEAL GARBAGE AND RECYCLING BINS

Pests flock to dumpsters. Make sure trash is stored at least 15-20 feet from your building and clean the surrounding area.

4 SEAL HOLES, CRACKS AND GAPS

Inspect the building exterior for small openings. Mice can fit through a hole approximately the size of a dime and rats, the size of a quarter.

5 CUT BACK PLANTS NEAR BUILDING ENTRANCES

At least 2 feet is a good rule of thumb. Trees and shrubs are a natural habitat for pests; so those that come too close to your building offer easy access.

6 CONTACT YOUR PEST CONTROL PROVIDER

Encourage tenants to report pest sightings immediately and involve your pest management professional as soon as possible.

IF YOU FEED THEM, THEY WILL COME.

An EXTREMELY rare example of an ant infestation

- The problem:
  - Is there any way we can get an exterminator at the boathouse? There are ants inside everywhere and all over the outside of the building.
- Our response:
  - Inspect
  - ID the ant
  - Determine control options
  - Post notice
  - Apply appropriate pesticide

Typical ant problem at UMASD

- The problem:
  - :We have ants in the stock room in the cafe area."
- Our response:
  - Inspect
  - ID the ant
  - Determine control options
  - Post notice
  - Apply appropriate pesticide

IF YOU FEED THEM, THEY WILL COME

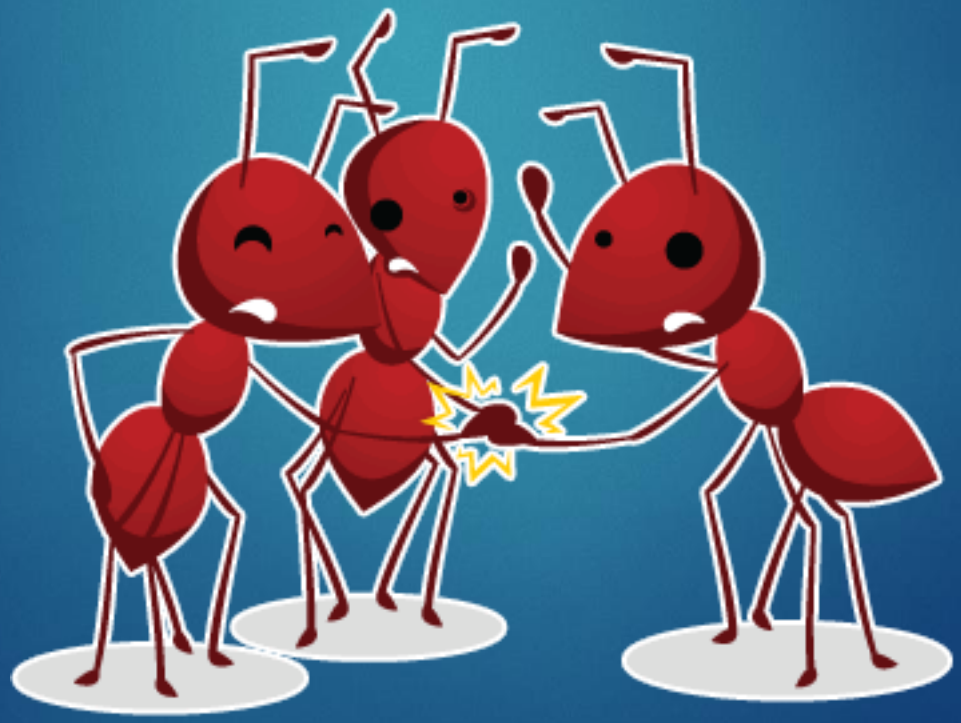
How do ants find food?

When **ants** leave the nest in search of **food**, they walk randomly, leaving trails of home-finding pheromone as they go.

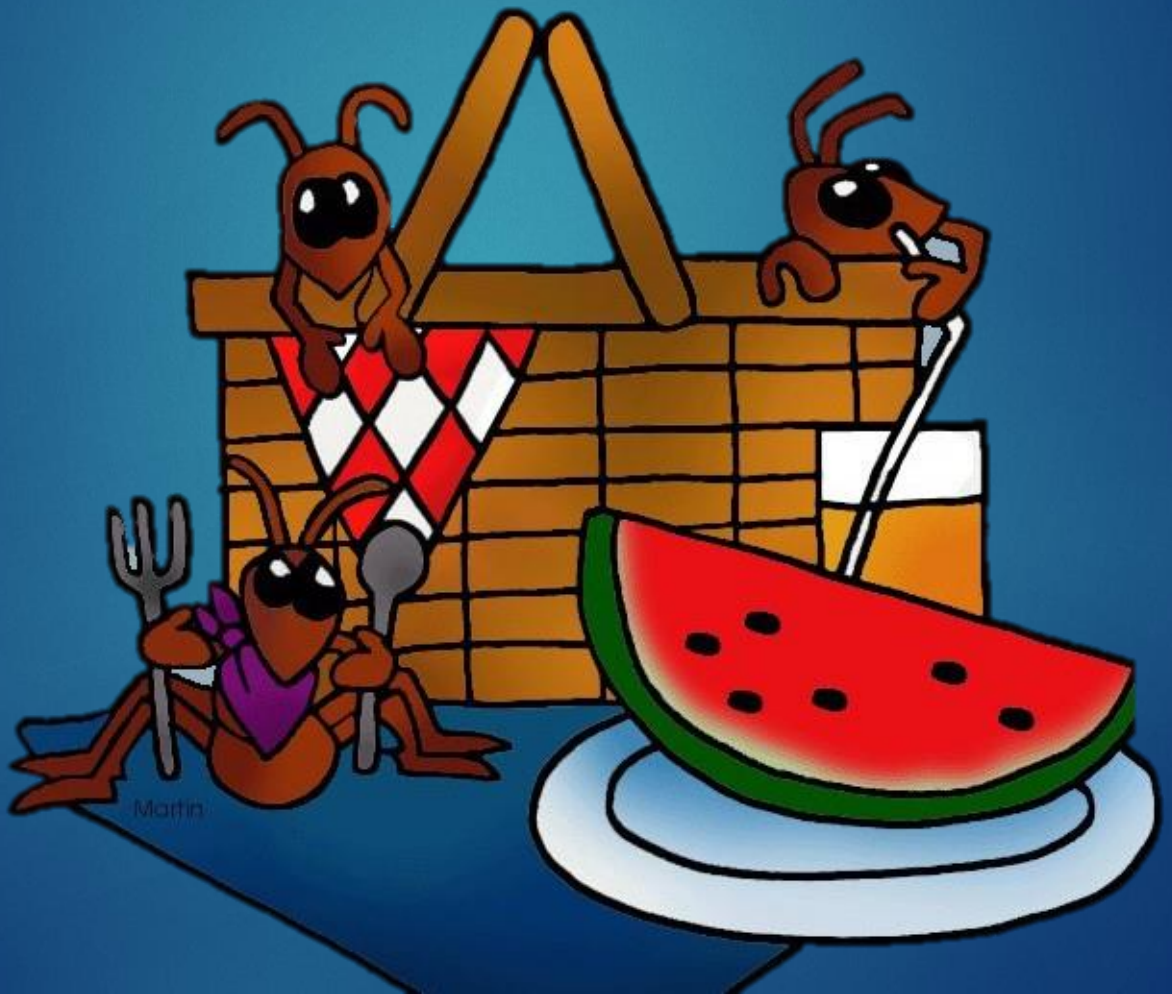
When an ant finds **food**, it picks up a piece and follows its home-finding trail back to the nest, leaving a trail of **food**-finding pheromone as it goes.

Think like an ant!!

So, how do you outsmart an ANT? It's so easy!



DON'T FEED THEM!



CLEAN THEM!

Use a general purpose cleaner:

- It cleans (kills) them
- It removes the trail that was laid down to the food
- It eliminates their food.

What did we learn about ants:

- If you feed them, they will come.
- You are smarter than an ant.
- Don't feed them – reinforce with your school district's employees.
- Clean them – reinforce this with your janitors.
- Relax

Upcoming School IPM Webinar

Photo: US Forest Service.Fed. Bugwood

- June 7 - Termite Mitigation in Schools

epa.gov/managing-pests-schools

Certificate of Attendance

CERTIFICATE *Of* PARTICIPATION

This is to certify the above participant attended the 90-minute webinar entitled

ANTS - #1 PEST IN SCHOOLS

PRESENTED BY: EPA's Center of Expertise for School IPM

ON THIS DAY: May 17, 2016

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Questions?

Photo: Sarah Vanek; Bugwood.org

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