Termite Mitigation in Schools
A Holistic Approach

Image: Gerald Lenhard, LSU; Bugwood.org

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Healthy Kids
Healthy Futures

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

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Dan Lisenko

Termite Mitigation in Schools

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The Foundation for The Gator Nation

If you can't take the time to do it right…

You must make the time to do it over!

Poster in 5th grade classroom

What is a termite and should I be concerned since schools are mostly concrete and steel?

What is a Termite?

- Soft-bodied, blind workers
- Squeeze into cracks <1/16 inch (???)
- Live in colonies in cooperation with each other. Efficient.
- Complex chemical communication
- Structurally destructive
- Over 100 million years old

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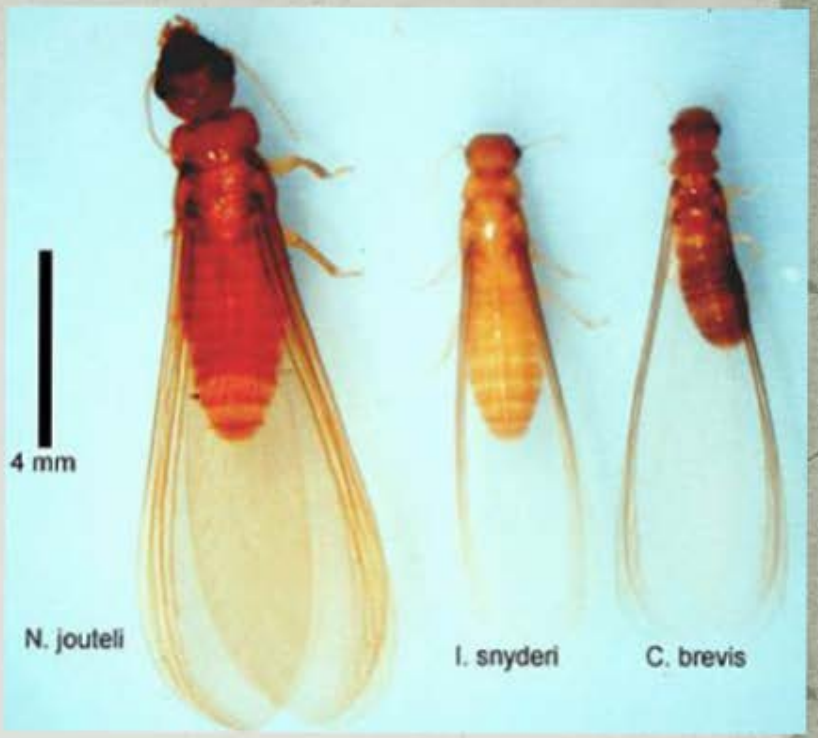
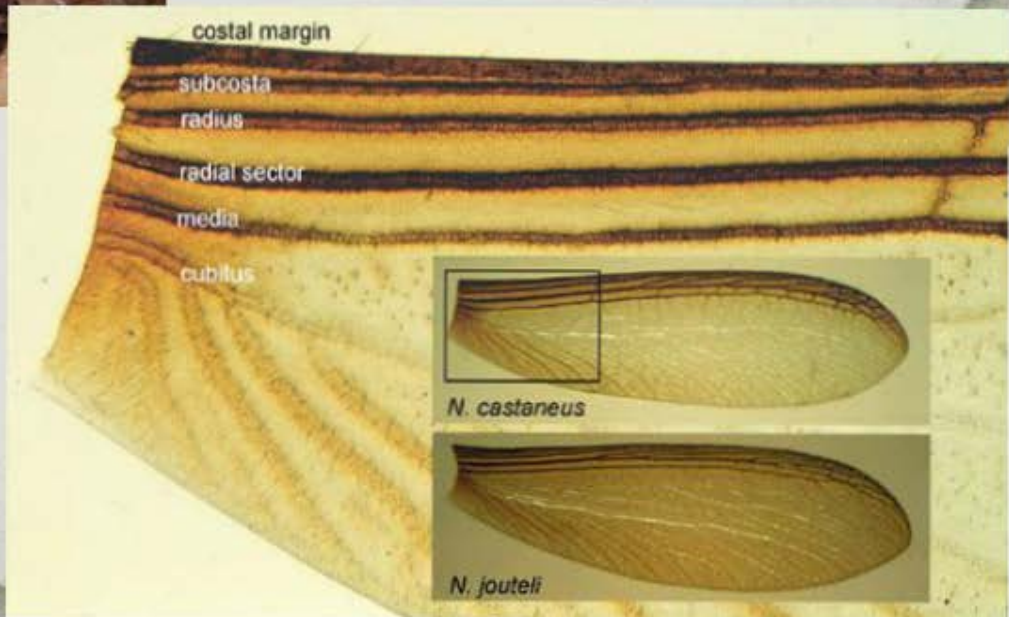
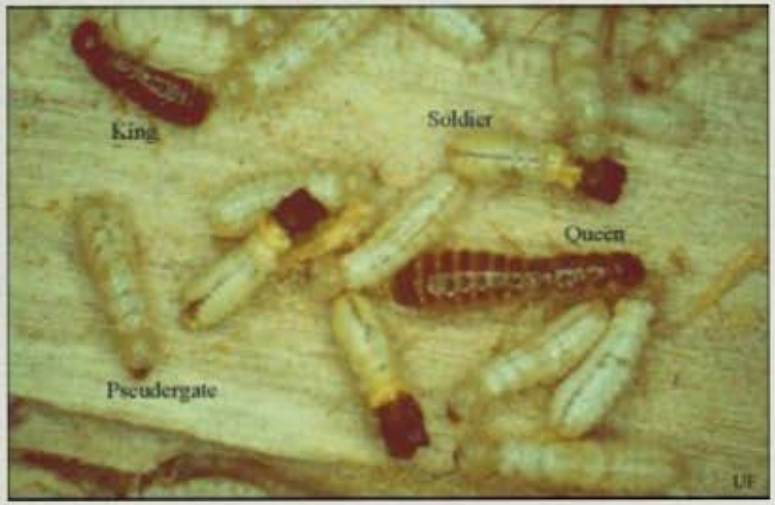
Types of Termites
Dampwoods

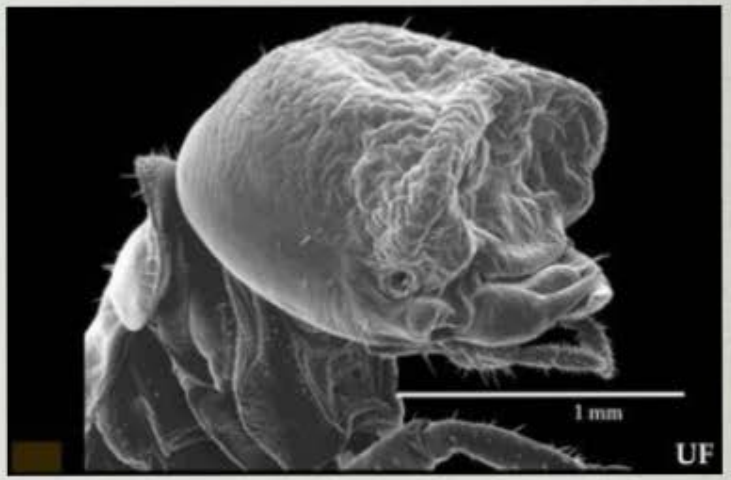




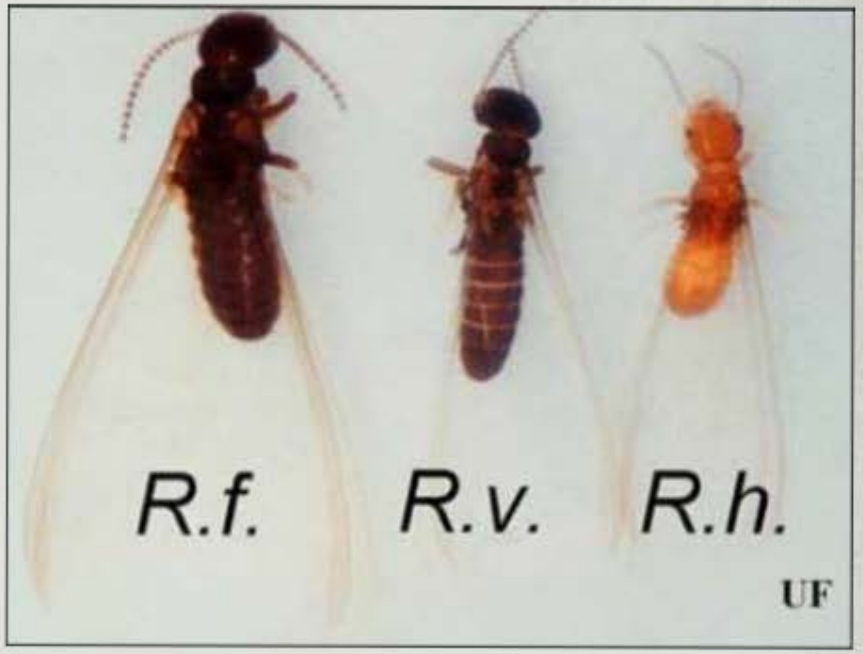
http://entnemdept.ufl.edu/creatures/urban/termites/neotermes.html

Types of Termite Drywoods





Types of Termites
Subterranean



http://edis.ifas.ufl.edu/mg064

Why are Termites so Hard to Kill?

- Eusocial
  - Cooperative brood care
  - Overlapping generations
  - Reproductive division of labor
- Castes
  - Worker
  - Soldier
  - Reproductives

Subterranean Termite Biology

Primary Reproductives

- Alates (swarmers)
  - Pair
    - Est. lifespan: up to 7-10 years
    - Queen: Unknown
  - Spring and fall
    - 60,000 (Su et al.)

Subterranean Termite Biology

- Secondary reproductives
  - Replacement or supplement
  - 600+ in one log
  - Can not just kill the queen

Subterranean Termite Biology

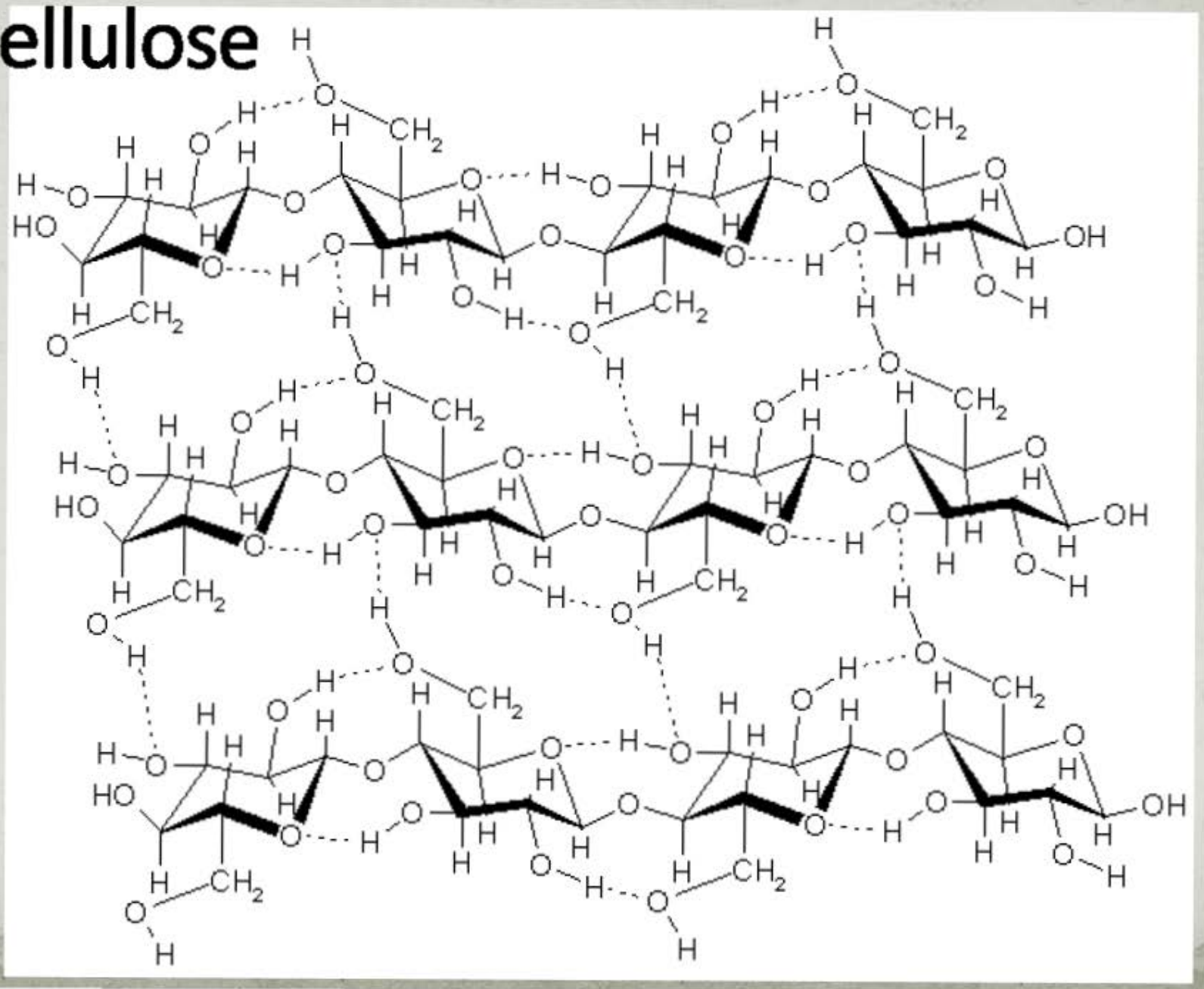
- Soldiers
  - Defenders
  - Low percentage of colony
  - Need to be fed
  - Highly sclerotized head
  - Smooth, prominent mandibles

Subterranean Termite Biology

- Workers
  - Damaging form
  - Forage for food
  - Tend royal pair, young, and soldiers
  - Build tunnels and tubes
  - Defend colony
  - Est. lifespan: few months to 2 years

Worker Termites

Cellulose



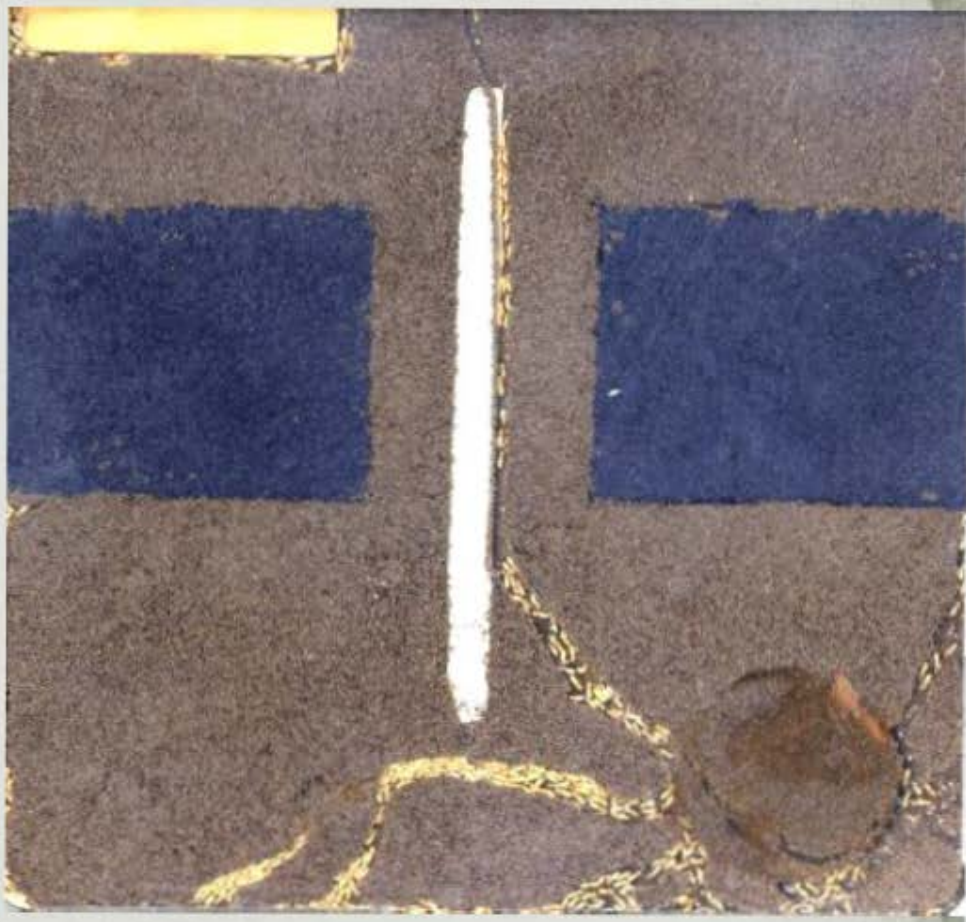
Why Subs Cause So Much Damage

- Social
  - Live together in a colony
- Colony size: Few thousand to over 10 million
- Territory: Around 200 sq. ft. to over an acre
- How do they find our structures?

Jane Medley, University of Florida

Foraging and Guidelines

Day 14



Day 14 (Found Gap 3d)

Disruptive

Costly

Contents

How do I know I have termites?

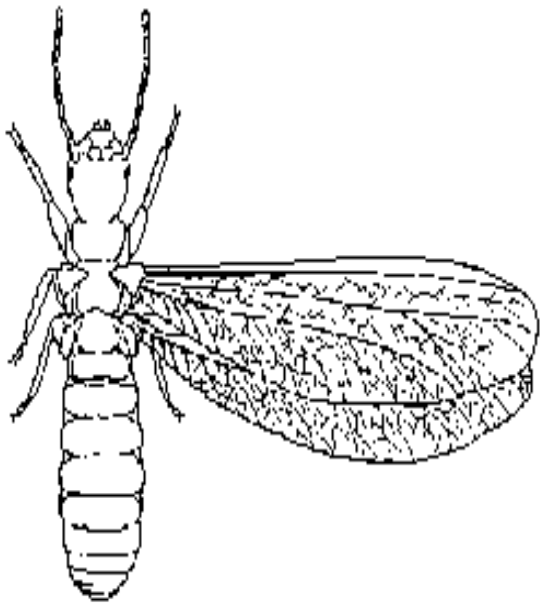
Know the Difference…

- …between termites and ants, drywoods and subs

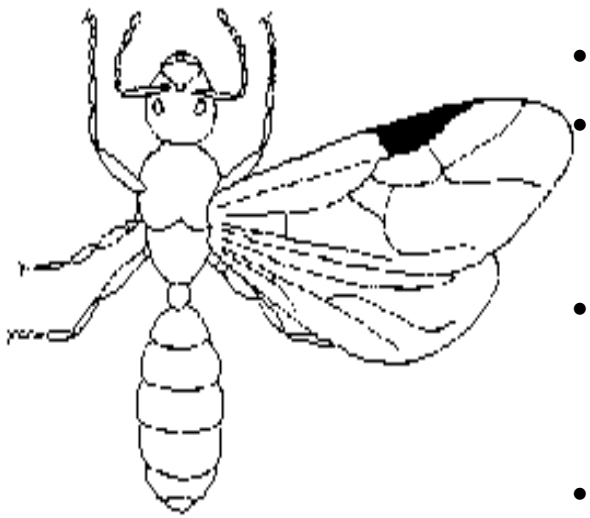
Termite vs. Ant

A Source of Common Confusion

- Termites
- Order Isoptera (maybe)
- No waist
- Forewing and hindwing about equal
- Moniliform (beaded) antennae
- Soft-bodied
  - Preserve in alcohol



Termite



Ant

- Ants
- Order Hymeno-ptera
- Waist
- Forewing larger than hindwing
- Geniculate (elbowed) antennae
- Hard exoskeleton

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Evidence of Infestation

- Mud tubes
- Wings
- Frass/pellets

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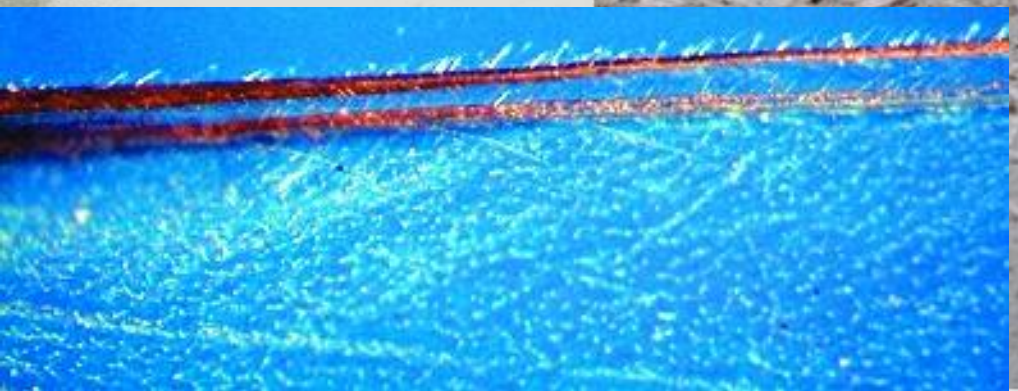
Evidence of Infestation

- Mud tubes
- Wings
- Frass/pelle



Evidence of Infestation

- Mud tubes
- Wings
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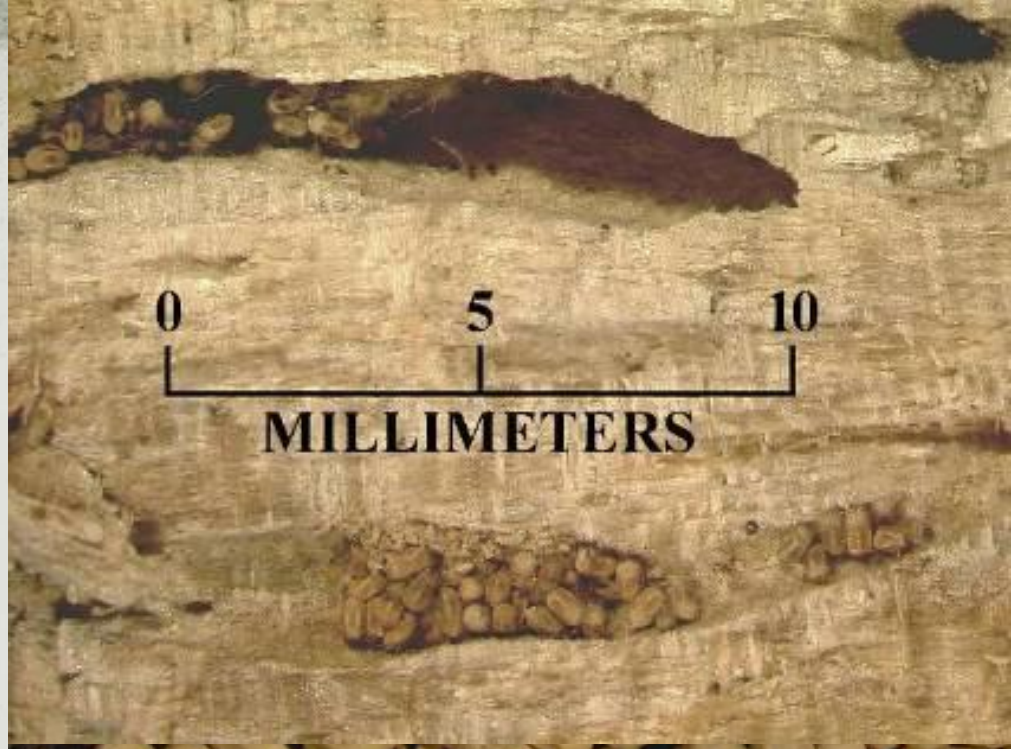

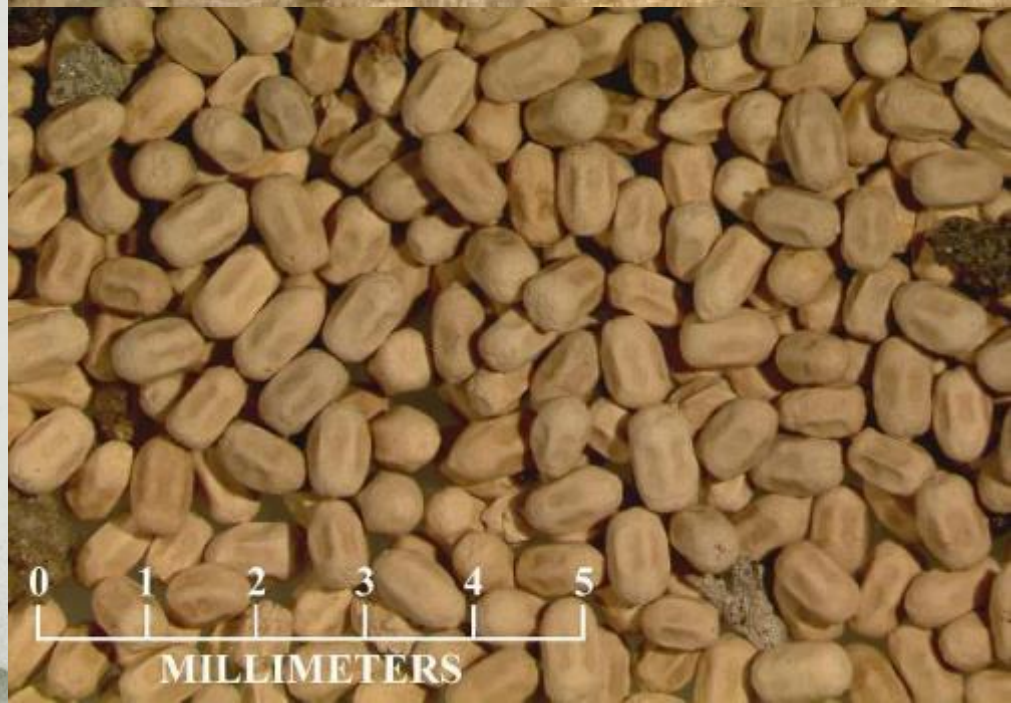

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Evidence of Infestation

- Time of swarm
  - Month
  - Day, dusk, evening
- Sometimes lucky enough to get termite
  - In alcohol

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What did this damage?
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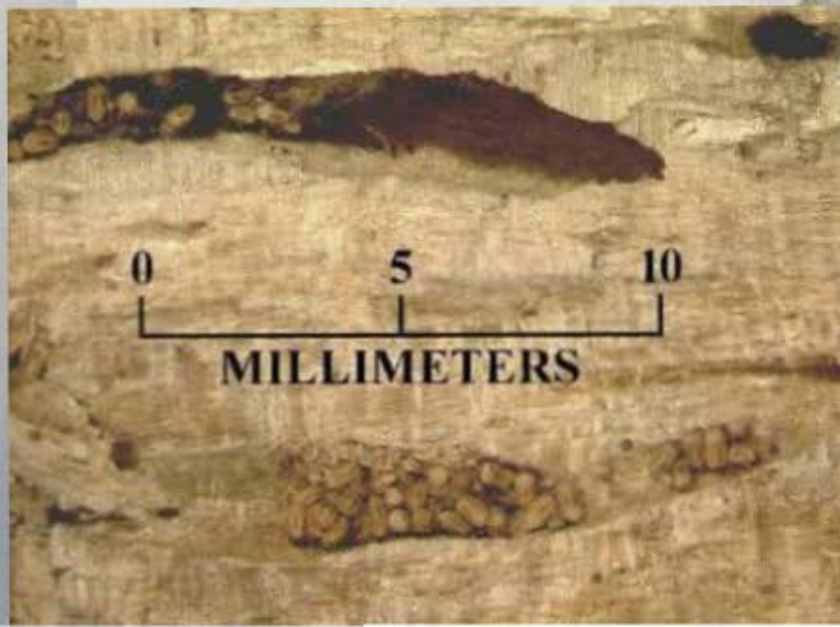
What did this damage?

Case Study

Case Study

Case Study

Match the Treatment

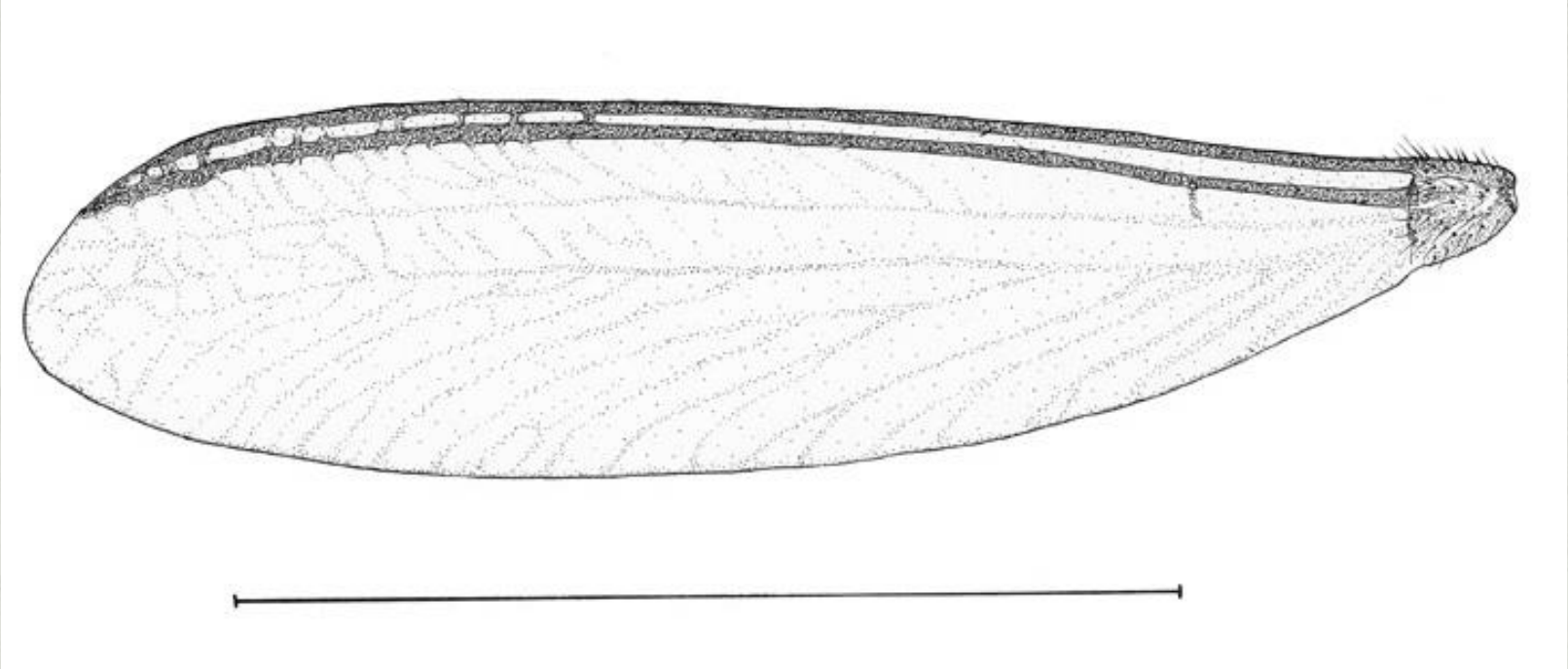


What Can You Tell Me About This?

KOBALT

If you can count to four…

2 “veins”

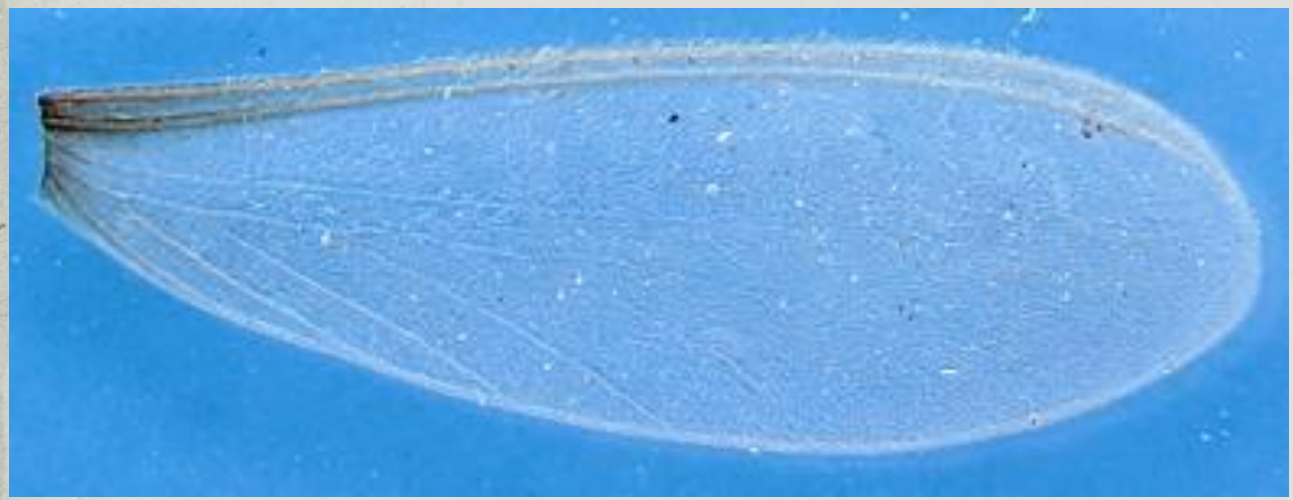


http://mississippientomologicalmuseum.org.msstate.edu/museumpersonnel./Joes.published.drawings/Termite.drawings.htm#.VpwphfkrJhE

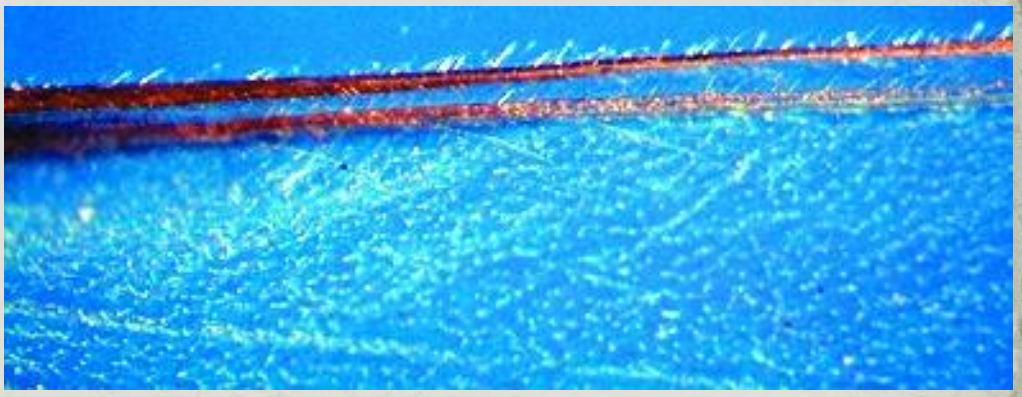
To whom do I belong?

http://insectsinthecity.blogspot.com/2013/10/whos-who-of-wdis.html

To whom do I belong?



Family?



Genus?

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Figure 10. ***Reticulitermes species alates from the southeastern USA. From left to right:*** *R. virginicus, R. nelsonae, R. hageni, R. malletei, R. flavipes. Scale bar = 1.00 mm.*

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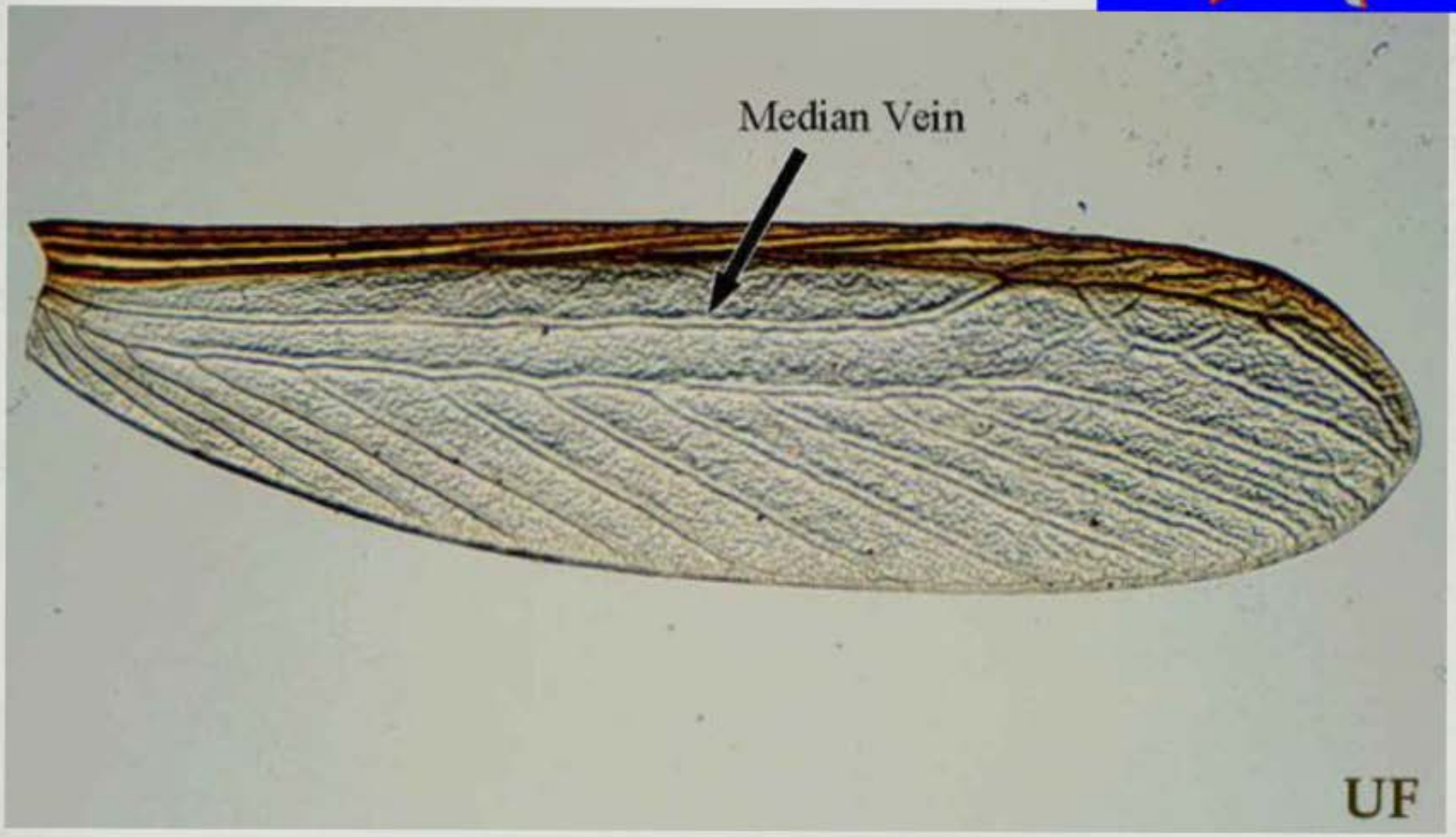
Cryptotermes brevis



Stolen from R. Scheffrahn

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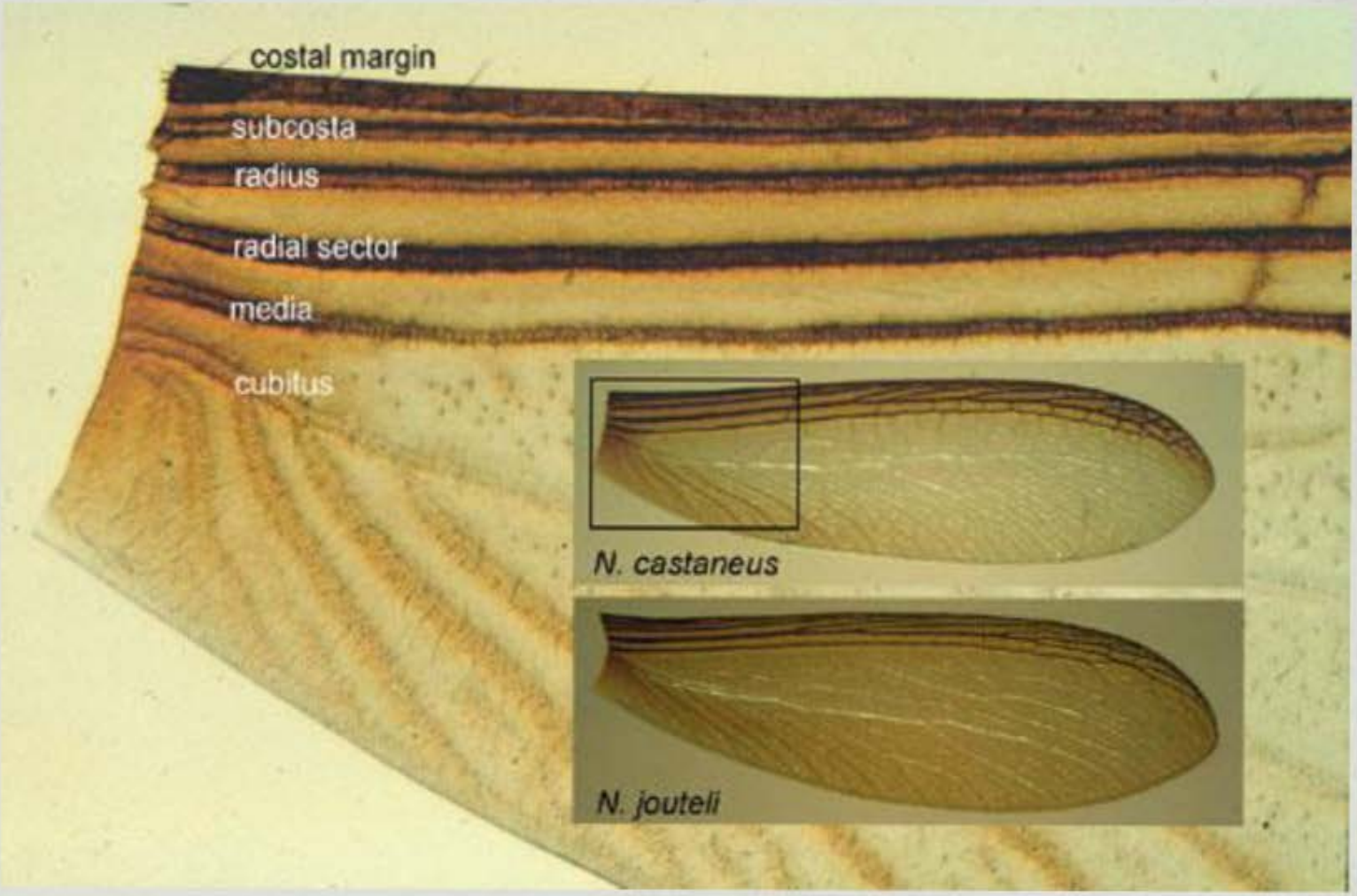
Neotermes sp



Stolen from R. Scheffrahn

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Subterranean vs Nonsubterranean termites

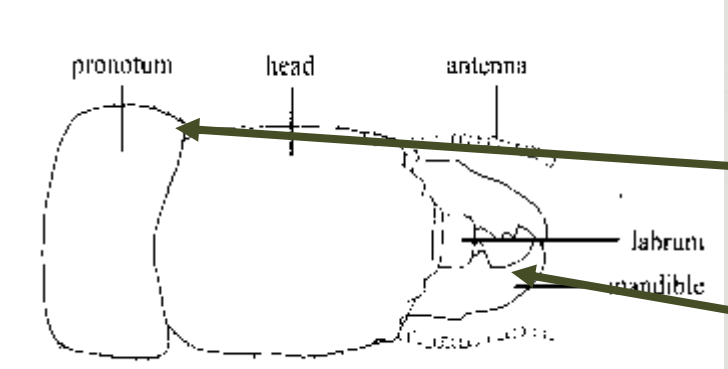

Figure 1: *N. jouteli*

Nonsubterranean

- pronotum as wide as or wider than head
- mandibles with teeth

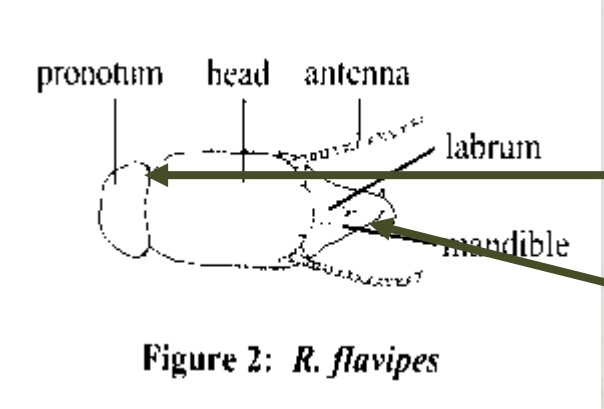

Figure 2: *R. flavipes*

Subterranean

- pronotum narrower than head
- mandibles smooth in appearance teeth

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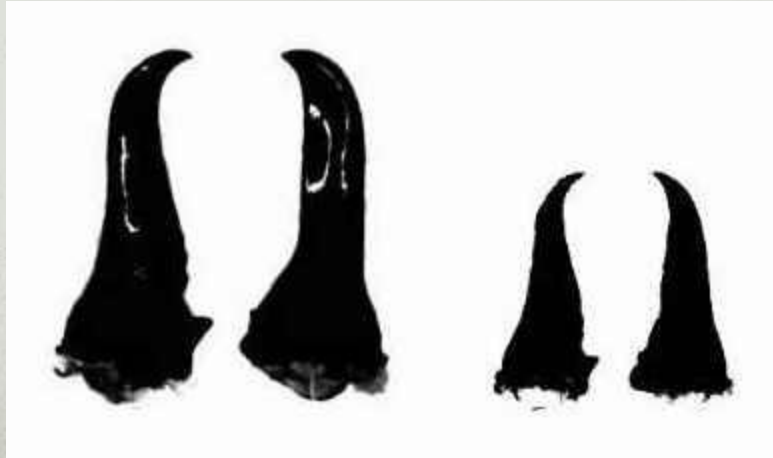
Drywood vs Subterranean soldiers

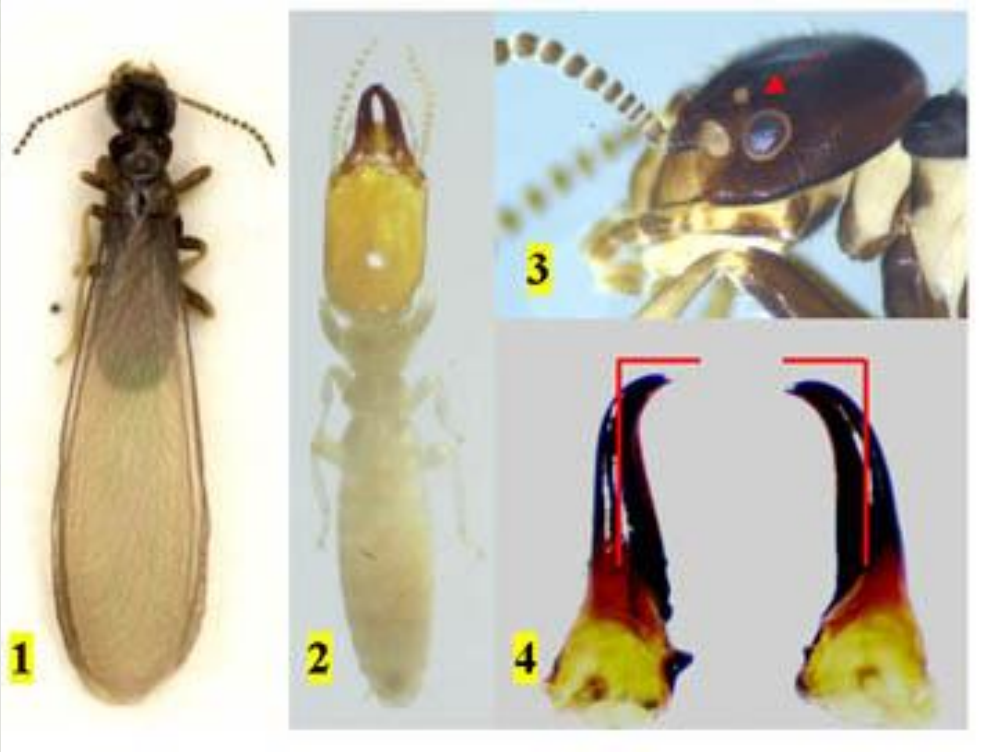
Drywood termite mandibles with teeth



Subterranean termite soldier mandibles smooth in appearance, “teeth” less pronounced

Most Commonly Encountered Subterranean Termites

- *Reticulitermes* _____
  - _____ subterranean termite



Large mandibles with left and right mandible distinctly curving inward close to 90º

http://www2.lsuagcenter.com/domains/lafirst/lahouse/termites/la_guide_e_sub.asp

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Less Commonly Encountered Subterranean Termites

- *Coptotermes* _____
  - _____ subterranean termite

Figure 2. Known distribution of the Formosan subterranean termite, *Coptotermes formosanus* Shiraki, in the United States, as of 2004. Graphic by Nan-Yao Su, UF

http://www2.lsuagcenter.com/domains/lafirst/lahouse/termites/la_guide_d_south_sub.asp

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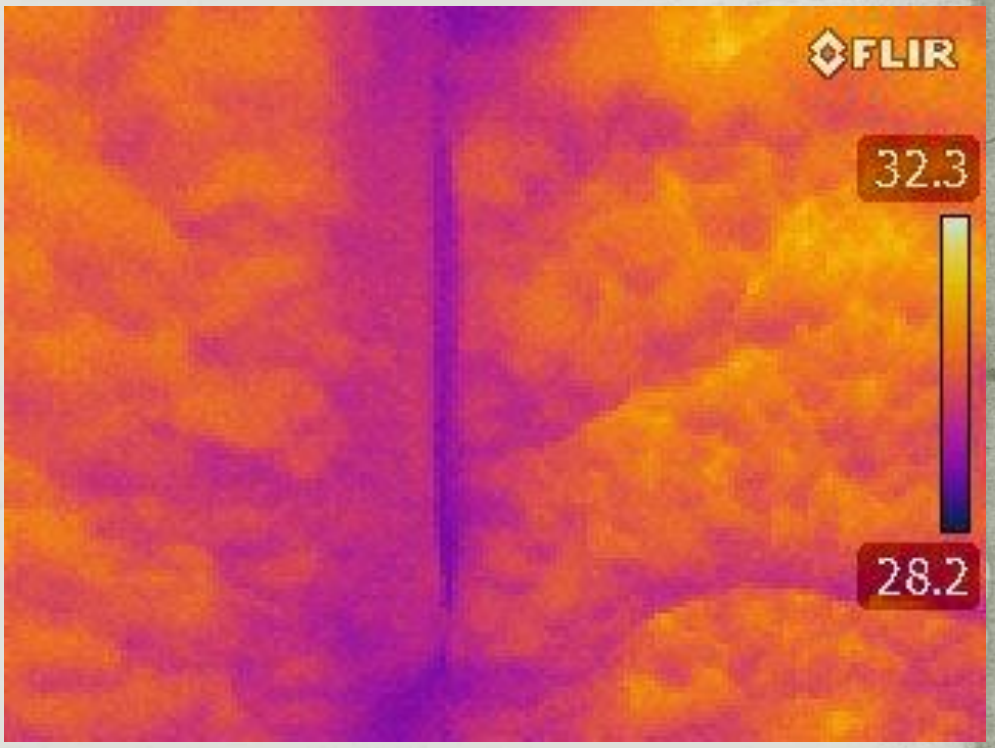
Inspection is the Key to Termite Management

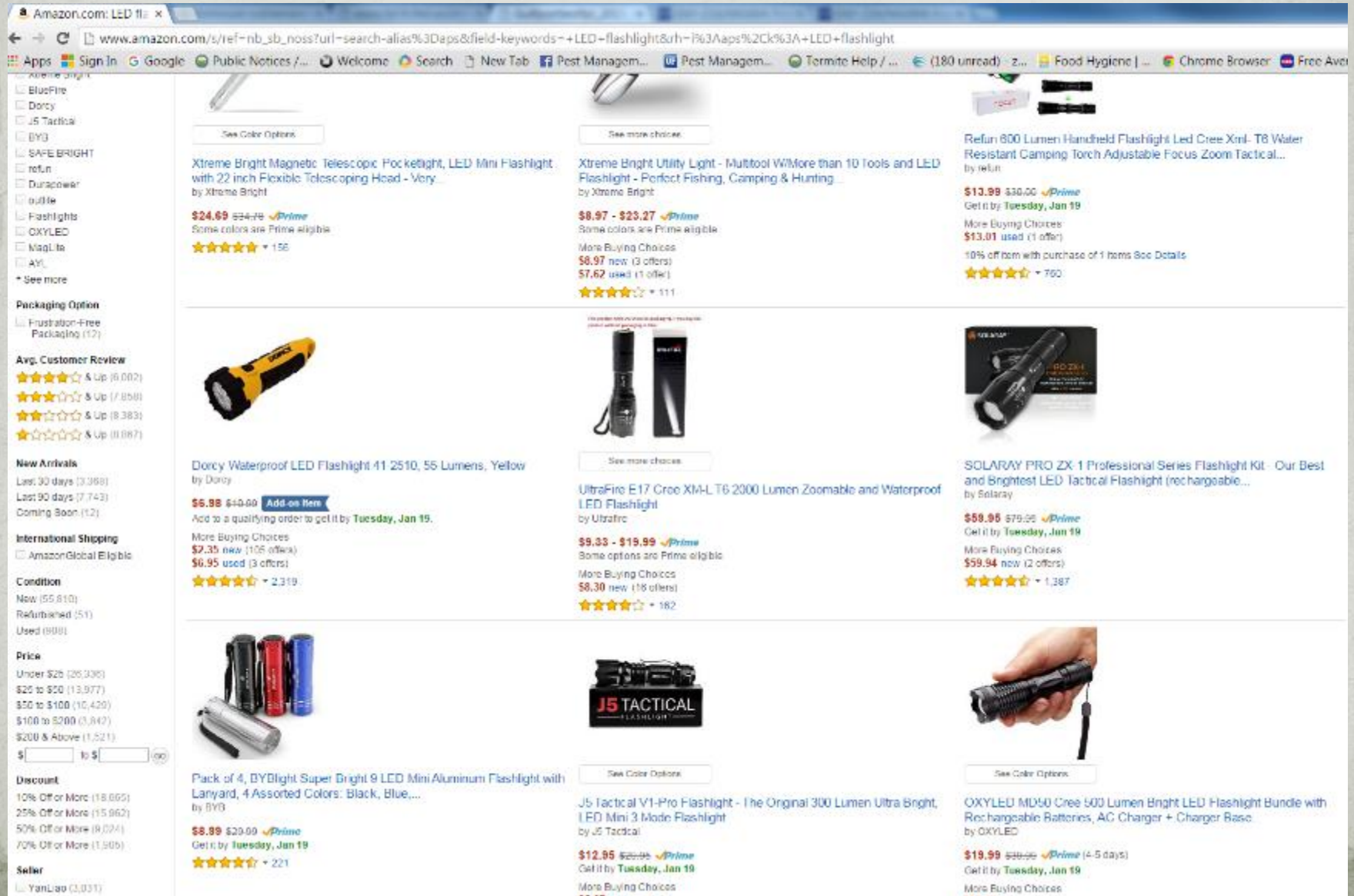
- How would you conduct an inspection?
- Be systematic
- Tools of the trade
- What recommendations would you make?



The Drones of Pest Control

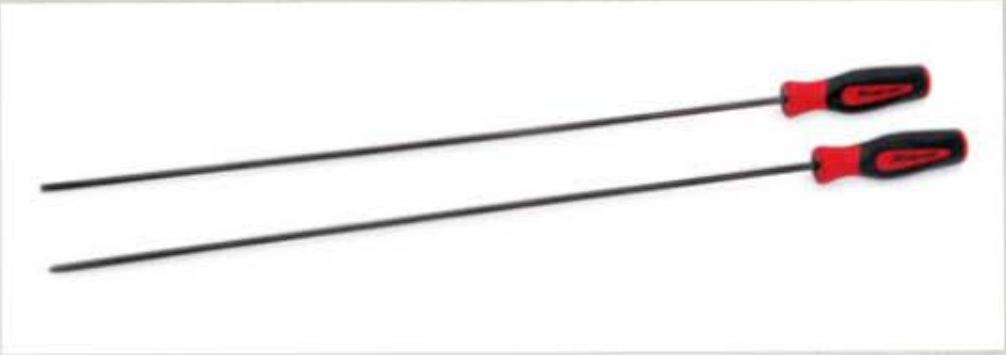
Inspection Tip

- Get a good flashlight!

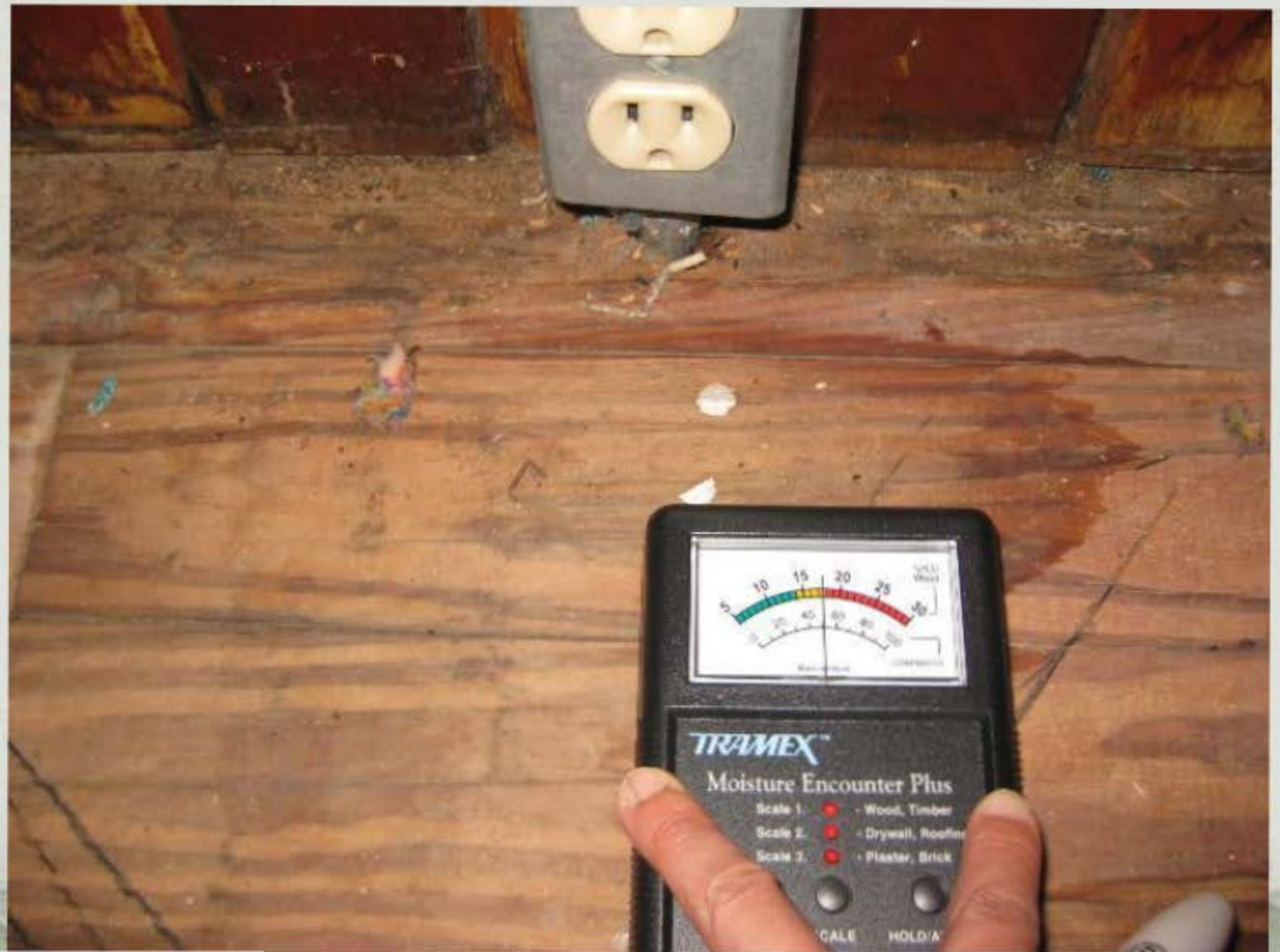


Inspection Tip
Learn how to use it...

Probe



Inspection Tip
Moisture Meter

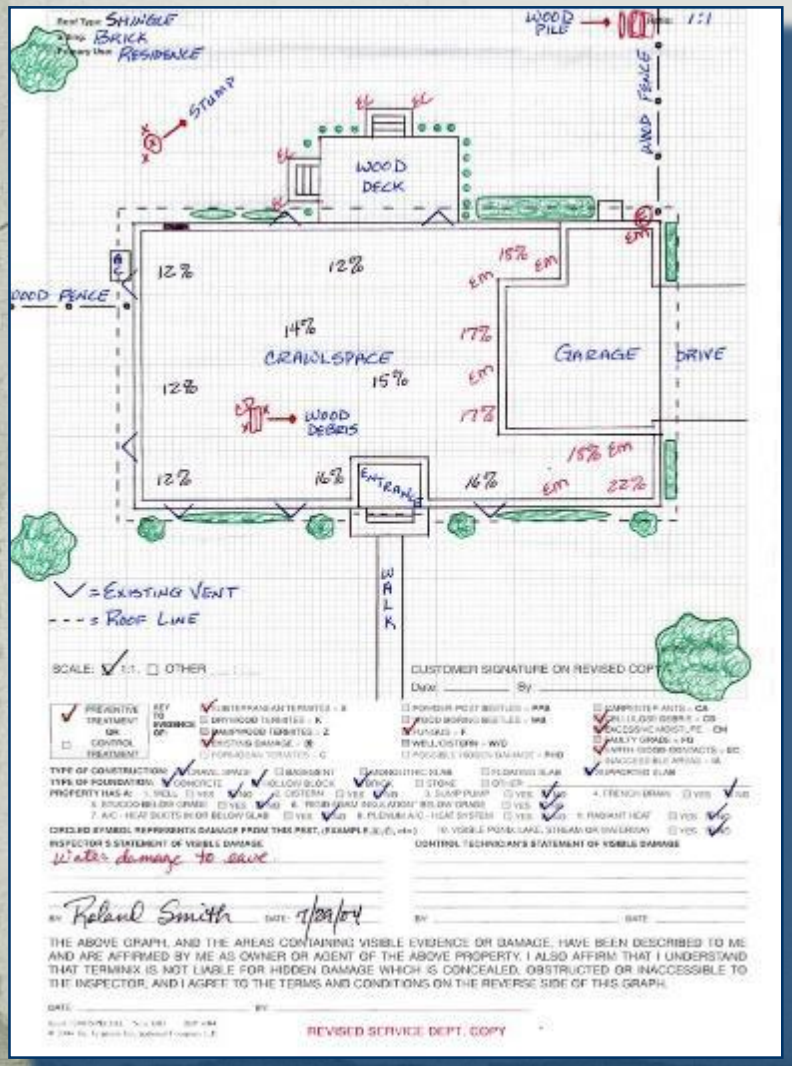


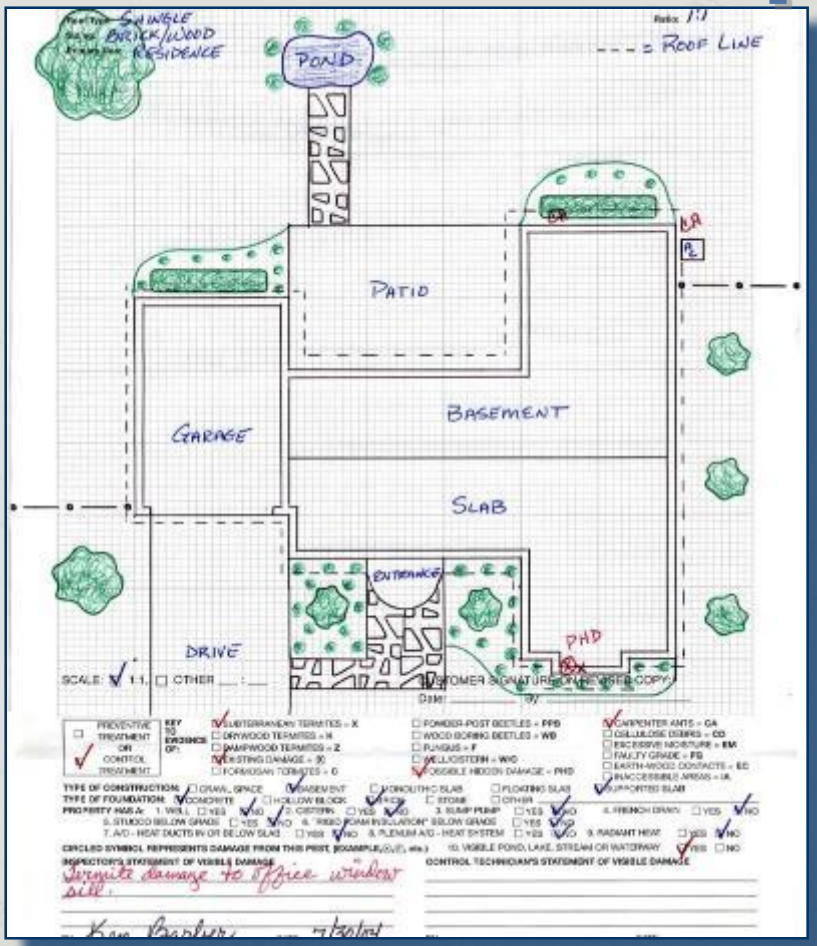
Inspection Tip
Moisture Meter

Use a Measuring Wheel!

The Importance of Graphs

Examples





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Conducive Conditions
Prevention and Sanitation

Termite Prevention Recommendations Haven't Really Changed in 80 Years

BAD:

- Wood in contact with ground
- Plant roots leading to foundation
- Watering walls
- No inspection space
- Moisture

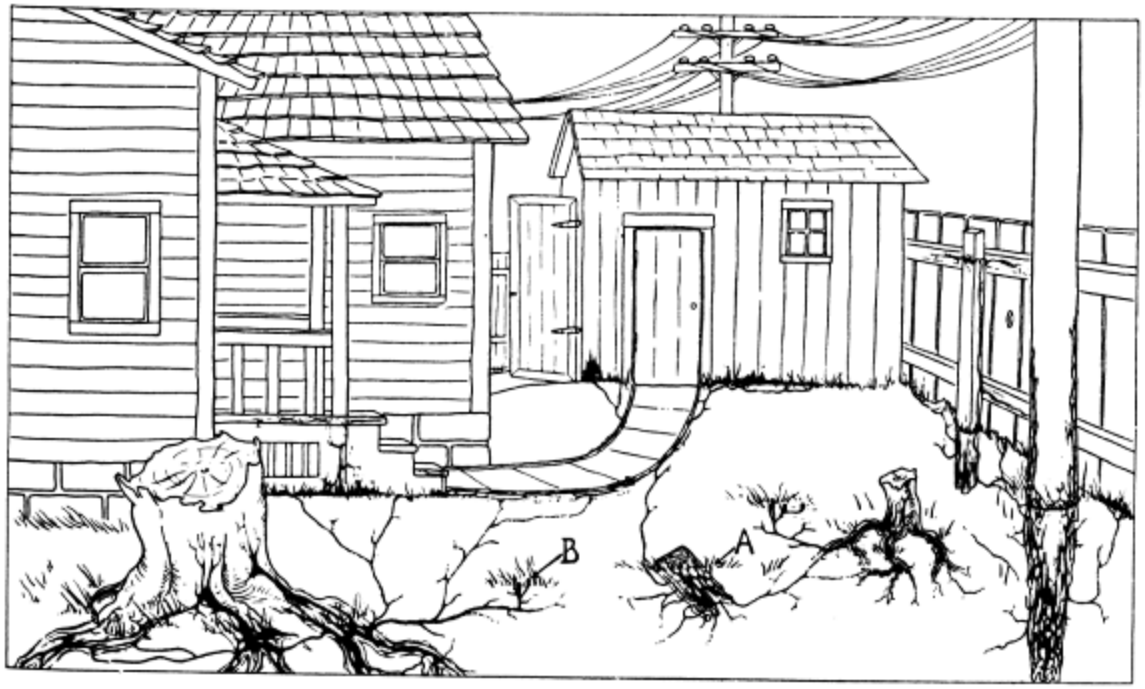


Fig. 50. This sketch combines the sorts of conditions found to prevail in many localities where wood has been improperly used. Unprotected wood in or on the ground makes possible both settlement and rapid increase of the subterranean termites. Workings in stumps, poles, posts, sidewalks, and wood of buildings are shown in black, as are the galleries within the earth. *A* marks the supposed original point of entry of one of the colonizing pairs, and *B* the points of emergence of swarming alates at the proper season.

Who does this?

Conducive Conditions Can Start Before Construction

Conducive Conditions Can Start Before Construction

Not every site will look this clean

Conducive Conditions Can Start Before Construction

Form Boards and Grade Stakes

Insulation Below Grade

Foam Block Below Grade

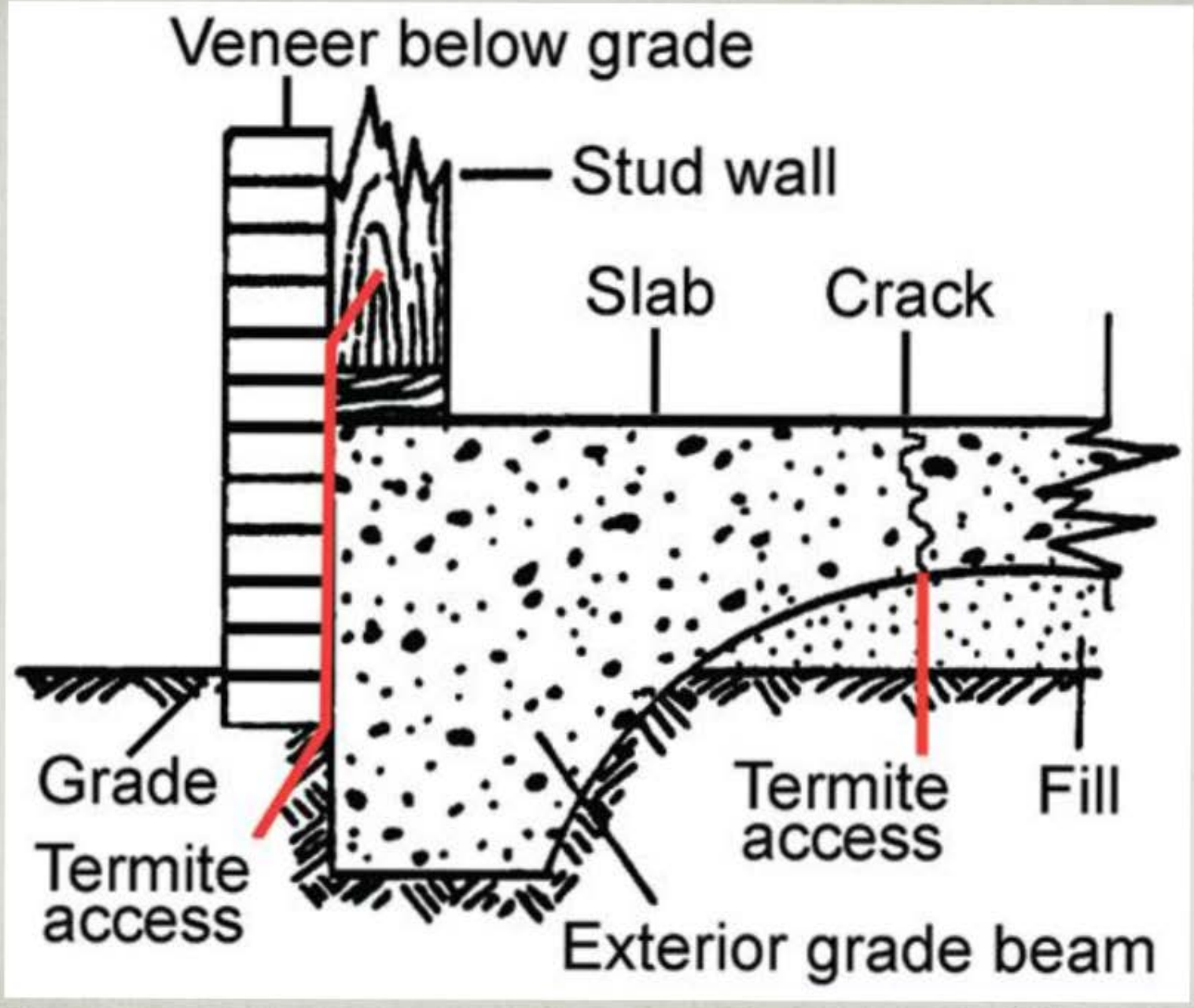
Landscaping

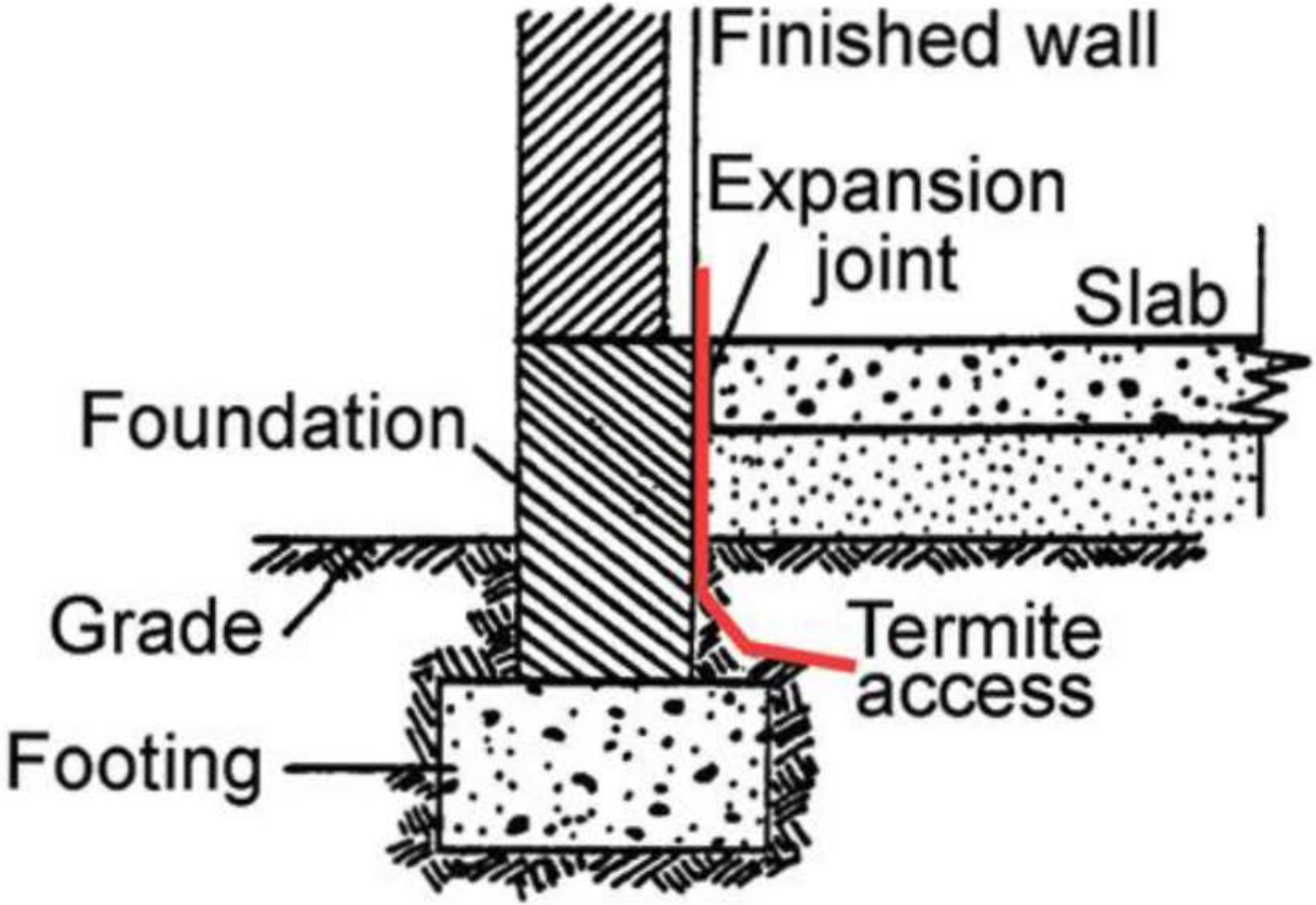
Inspection is the Key to Termite Management

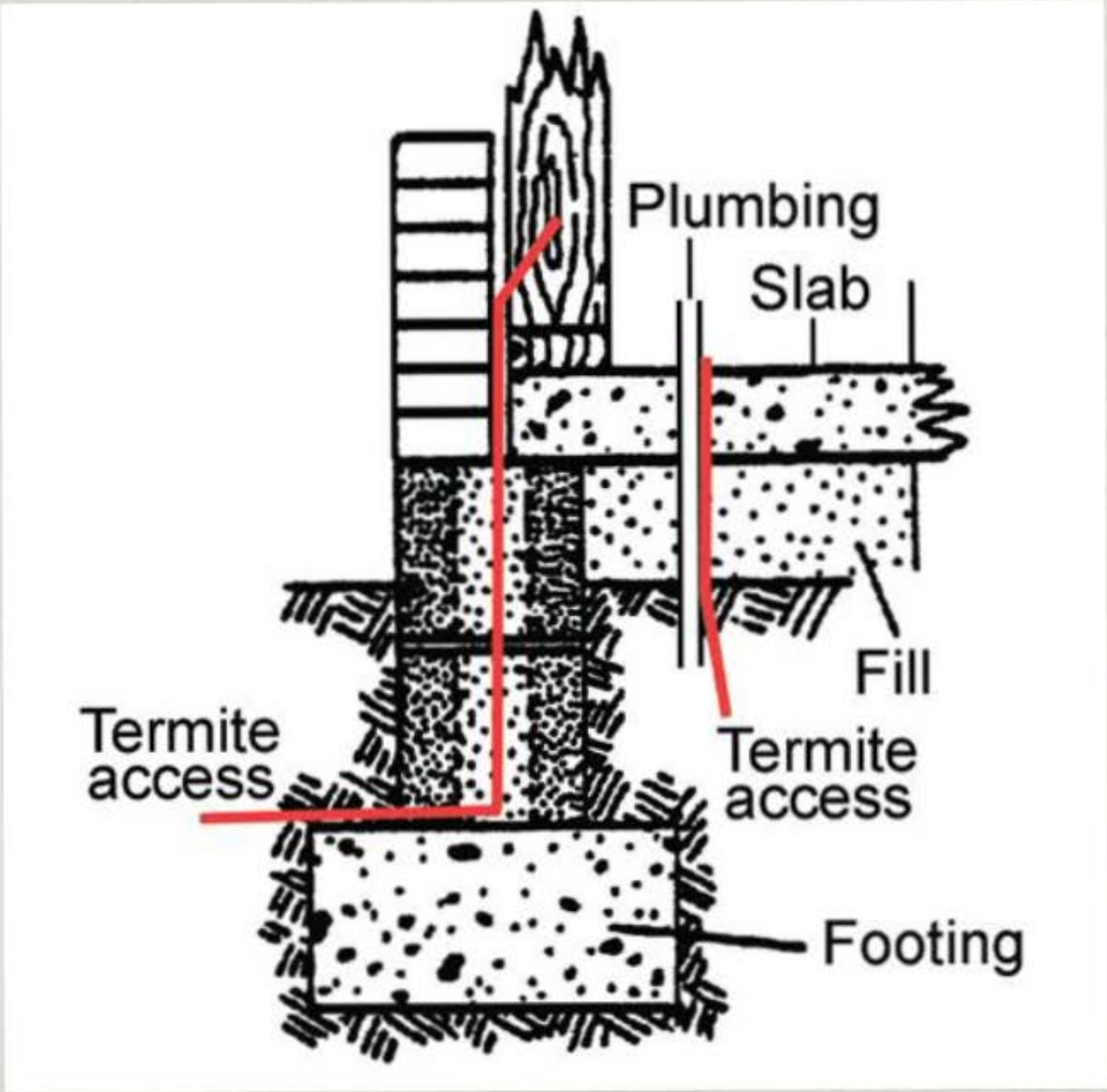
- Think about your schools, what recommendations would you make?
- Do you have a quality control process?

What to observe with vendors

- Did they do an inspection to identify where and how termites are entering?
- Can they tell you what slab type you have and how termites might be entering? Goes to treatment recommendations.
- Easy check: match gallons purchased and gallons used with work required.
  - Require mixing onsite


Veneer below grade
Stud wall
Slab
Crack
Grade
Termite access
Termite access
Fill
Exterior grade beam


Finished wall
Expansion joint
Slab
Foundation
Grade
Termite access
Footing


Plumbing
Slab
Fill
Termite access
Termite access
Footing

Pipes and Conduits (Electrical Service)

What to expect when working with a pest control company

- Or maybe, what to ask when working with a pest control company
  - Are they licensed to do termite work?
  - Have they done termite treatments on commercial buildings?
  - Will they warrantee their work? If not, why?

Successful termite jobs

- Know which termite (sub or DW)
- Know your construction type
  - Start with slabs; get plans
- Know the label
  - Product—rates
  - 1/10, 2/10, 4/10…what does this mean?
- Rig—calibrated?
  - Product distributed?
  - Application—tips that can help you
- Enough product to mix on site? How do you know this?
- Calculations!

Termite Mitigation in Schools

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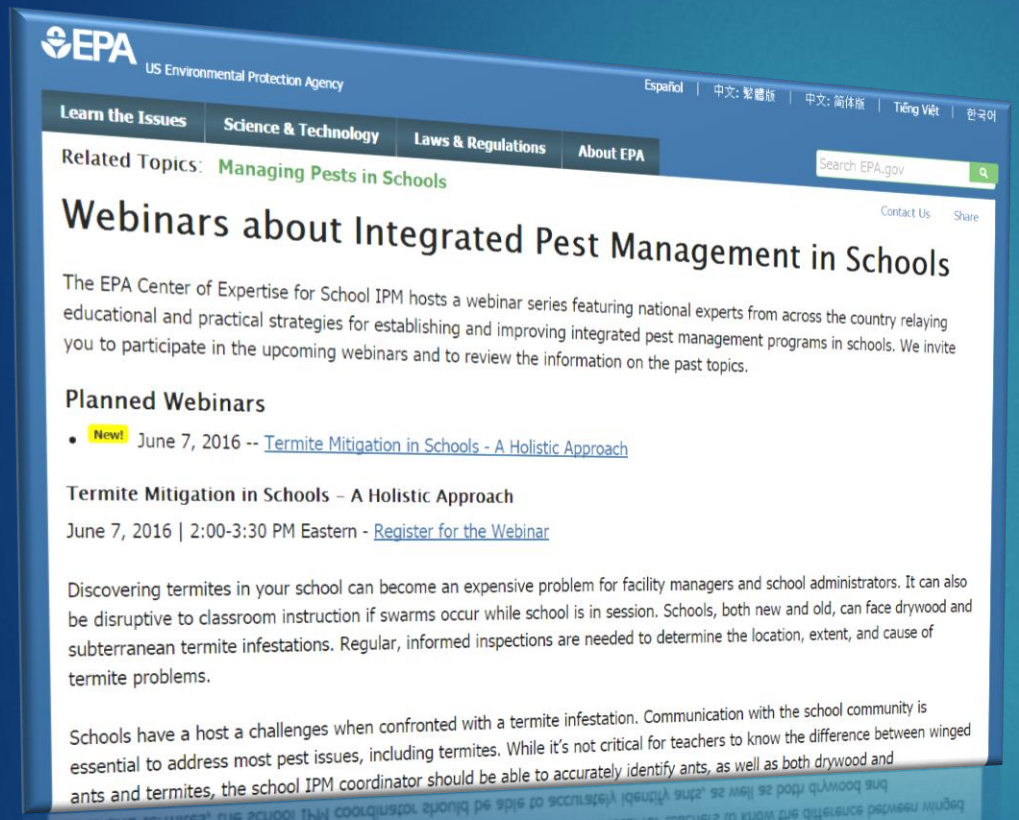
Future Webinars



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Planned Webinars

- New! June 7, 2016 -- Termite Mitigation in Schools - A Holistic Approach

Termite Mitigation in Schools – A Holistic Approach

June 7, 2016 | 2:00-3:30 PM Eastern - Register for the Webinar

Discovering termites in your school can become an expensive problem for facility managers and school administrators. It can also be disruptive to classroom instruction if swarms occur while school is in session. Schools, both new and old, can face drywood and subterranean termite infestations. Regular, informed inspections are needed to determine the location, extent, and cause of termite problems.

Schools have a host a challenges when confronted with a termite infestation. Communication with the school community is essential to address most pest issues, including termites. While it's not critical for teachers to know the difference between winged ants and termites, the school IPM coordinator should be able to accurately identify ants, as well as both drywood and

-
-

CERTIFICATE *Of* PARTICIPATION

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

TERMITE MITIGATION IN SCHOOLS – A HOLISTIC APPROACH

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

ON THIS DAY: June 7, 2016

Sign up for

EPA's School IPM Listserv

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Questions?

Image: Clemson University / USDA Cooperative

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