TERMITES

- How many species? 45 species in U.S.
- What Kind?
  - Subterranean termites
  - Drywood termites
  - Dampwood termites
  - Rottenwood termites
  - Termitidae (desert termites)

Among the termites, we will concern ourselves only with

- Subterranean termites – Reticulitermes spp.
- Drywood termites – Incisitermes spp.

Subterranean Termites

There are ten species of subterranean termites in this country.

They all do the same kind of damage.

The colonies are developed in the soil and feed on wood or virtually any cellulose-bearing material.

SUBTERRANEAN TERMITES

- Three or perhaps four species in western CO & eastern UT:
  - However many there are, we deal with all of them in the same manner.
  - All species in this area are subterranean species of the genus Reticulitermes
  - There is another species of subterranean termite, in the genus Coptotermes – the Formosan termite. At the present time, it is found all along the Gulf Coast, with scattered populations in Arkansas and Texas.
  - Let’s hope it stays there!
Subterranean Termites

Do this!

And this!

Sometimes you want to do this!

Are These Termite Tubes?

TERMITES

Strange as it may seem, termites are beneficial insects.

Termites are unusual in the insect world; they eat and digest cellulose.

Termite colonies consist of more than just males and females – they have a caste system consisting of:

- Male and female (the queen) reproductive workers (modified females)
- Soldiers
- Nasutes (in some species)

Subterranean Termite Queen

TERMITES

Gradual metamorphosis, consisting of egg, nymph and adult.
How can termites utilize cellulose as food?

Bacteria in the termite gut breaks down the cellulose into various chemical compounds.

Enzymes then convert the chemical compounds into fats, starches and sugars, just as our own digestive system works.

Swarmer photo courtesy of Fusion Anomaly

In General, once termites find conditions to their liking, they will proceed nonstop.

However, all of the factors leading to infestation, or dictating against it, may come into play to temporarily stop an attack:

- Contact with soil, accessibility, temperature, moisture in the wood, ambient humidity, species of wood, heartwood or sapwood, age of wood, vibrations of all sorts, previous damage by other insects or rot, can all play a part.

Terry Wagner, of the Forest Insects Laboratory in Gulfport, Mississippi calls this phenomenon “premature transitory attack”.

Once the female reproductive is mated, she becomes little more than an egg-laying machine, tended by the king termite and a portion of the workers.

Other workers build mud tubes and forage for food.

The soldiers defend the colony and the foraging workers.

Soldier termite photo courtesy the University of Maryland

Nasute photo © Dale Ward

A DESTRUCTIVE COLONY DOES NOT FORM OVERNIGHT!

The initial queen may only lay a few dozen eggs.

Unless a structure has been built directly over a colony, it will be two years or more before any appreciable damage is done.

It will likely be three to five years before the first swarming.

It is a common assumption that, once termites begin their attack, they are there to stay and will continue their attack.

THIS ASSUMPTION IS FALSE!

- Repair structural and plumbing leaks.

- Pull all mulch and landscaping back at least 6 inches from the foundation.

- Remove piles of trash and debris from around the home.

- Remove dead tree stumps from the yard.

- Keep firewood stacked away from the structure.

- Make sure downspouts are long enough to direct water away from the foundation.

- Keep gutters clean.

- Avoid direct wood-to-ground contact when building porches or decks.

- Siding, brick veneer, or foam insulation should not extend below the soil grade.

Subterranean Termites
Types of Construction

PREVENTION
TERMITE TREATMENT MEASURES

REPELLENT TERMITICIDES
- Tribute
- Demon TC
- Dragnet
- Prelude
- Preval
- Talstar
- Torpedo

TERMITE TREATMENT MEASURES

NON-REPELLENT TERMITICIDES
- PREMISE
- TERMIDOR
- PHANTOM

TERMITE TREATMENT MEASURES

BAIT SYSTEMS
- Sentricon
- Exterra
- FirstLine
- Subterfuge
- Advance

BAIT SYSTEMS

Advantages
- Environmentally friendly
- Persons with chemical sensitivity
- No concerns with wells or bodies of water
- Reduces drilling of slabs, porches, etc.

BAIT SYSTEMS

Disadvantages
- Can’t coax termites into stations
- Professional bait systems more expensive than liquid
- Used alone do not protect structure directly

WOOD TREATMENT

Applied pre-construction.
Applied post-construction.
- BoraCare
- Timbor
- Tempo
- Demon TC
- Premise
- Phantom
- Transport
- Terminator
- Suspend SC
Dry Wood Termites

- Cedar roofs are ideal for drywood termites.
- Virtually all wood elements of construction, but not in this part of the country.
- Commonly found in imported wood furniture, statuary, packing crates and pallets.

Colonies are small – several hundred to several thousand individuals.
May be more than one colony in a single piece of wood.
Are not dependent upon moisture – can survive on the moisture inherent in the wood.

The first sign of drywood termites may be winged reproductives.
Who dunnit?

Are the holes created by lyctid beetles, or drywood termites?

If the holes are about the size of the ball of a ballpoint pen and the stuff on the floor is like:

- Talcum powder, bet on lyctids.
- Granular and six-sided, take a good-sized loan and bet on drywood termites!

How do they get started?

- Dead trees, brush and firewood are the primary habitat of drywood termites. When land is cleared and buildings are constructed, those buildings are then attacked.
- Drywood termites enter buildings through attic or foundation vents, directly through or under wood shingles, under eaves and fascia boards, and through natural cracks and joints in exposed wood trim, window and door frames and sills.
- Drywood termite alates can penetrate flat wood surfaces, but prefer to wedge themselves into narrow places to begin tunneling.
- Most new homes are constructed on concrete slabs and have tile roofs. However, attic areas are normally vented and external wood trim is still commonly used.

Or, first evidence of their presence may be

THIS>>>>>

or

THIS>>>>>
Drywood Termite Tunnels

- They seem to love handcrafted furniture.
- Particularly if it comes from old Mexico.
- And especially if you paid a fortune for it.

TERMITES

TERMITES ARE NOT WITHOUT THEIR OWN PROBLEMS!

- CERTAIN BEETLES, ANTS, NEMATODES, FUNGAL AND OTHER DISEASES
  - Can play a role in the health of a colony.
  - There is even a miniature lookalike which may live in sympathy within the colony — see the picture at right.
  - They are of the Order Zoraptera.

No control — Colonies grow slowly — monitor.

- Replace infested wood.
- Localized or spot treatments.
- Fumigate.
  - Heat
  - Chemical
OTHER WOOD-DESTROYING INSECTS

- No matter what other wood-destroying insects we’ll talk about today, they all have one thing in common –
- THEY ALL HAVE COMPLETE METAMORPHOSIS:
- Egg, Larva, Pupa, Adult.

WOOD-DESTROYING BEETLES

Three groups of beetles can do severe defacing damage to structures and furniture.

- Powderpost beetles (subfamily Lyctinae)
- Deathwatch beetles (Anobiidae)
- False powderpost beetles (Bostrichidae)

WOOD-DESTROYING BEETLES

- The damage caused by those three families of beetles often becomes the focus of damage claims.
- Those claims can involve you as pest management professionals.
- While it is not likely that you will be called upon to deal with these pests, you need to know something about what they look like, their life cycles, the damage they do and whether the damage is current or old.

POWDER POST BEETLES

- (Family Bostrichidae; subfamily Lyctinae)
- The adults are flattened, slender and reddish-brown to black.
- They are extremely small, 1/32 to 1/16 inch in length.
- Their heads project forward and are visible from above.
- The larvae are C-shaped and slightly hairy.
- They are yellowish-white with a brown head.
- It is the larvae which do the damage.

POWDER POST BEETLES

- (Lyctinae)
- They can be found in dead, as well as dried and cured lumber.
- They can cause extensive and expensive damage to such things as flooring, furniture, antique wood objects, gun stocks, and trim.
- They rarely infest wood older than 5 years.

POWDER POST BEETLES

- (Lyctinae)
- Lyctids ordinarily attack large-pored hardwood such as hickory, pecan, walnut, oak and mahogany.
- They rarely attack softwoods such as pine and spruce.
- The frass from their boring is like fine flour or talcum powder and is loosely packed in the tunnels.
- Infestations in a home are usually the result of eggs or larvae in the wood when it was placed in the home.
- The life cycle of these beetles is from 3 months to about one year.
Activity of Powder Post Beetles
(Based on work by Lonnie H. Williams)

Dec - Feb (winter)
Larvae enter period of inactivity due to low air temperatures (primary) and low wood moisture (secondary)—i.e., they stop feeding and growing.

Mar – May (spring)
Larvae complete development as air temperatures and wood moisture returns. Adult beetles emerge during this time, mate and lay eggs. In instar larvae enter wood and begin feeding and growing.

June-Aug (summer)
Adult emergence tails off or is finished by June/July; young larvae are feeding inside wood, growing and becoming better established.

Sep-Nov (fall)
Larvae inside wood continue to feed and grow—approaching maximum size.

DEATHWATCH BEETLES
(Anobiidae)

Adult deathwatch beetles communicate with each other by tapping their head on the wood, usually at night.

Medieval folklore had it that this tapping (which is audible in a very quiet house) was a portent of impending death.

The adults of this family tend to be larger than those of the powder-post beetles — 1/16 to 1/8 inch long.

DEATHWATCH BEETLES
(Anobiidae)
- The larva of these beetles is C-shaped.
- It is larger than the lyctid larva, and humpbacked.
- Like the lyctid larva, it has a dark head.
- Also, like the lyctid larva, it does the damage to wood. However, it is easy to tell which beetle did the damage.

Using a ball point pen, only the tip of the ball will fit in a lyctid hole.
With anobiid damage, the tip of the pen will enter the hole part way up the angled face of the point.

- The frass made by these beetles is coarse and sometimes pelletized, and is packed loosely in the tunnels.

FALSE POWDERPOST BEETLES
(Bostrichidae)

- Because they are much larger than members of the other beetle families we have discussed, bostrichid holes are much larger. The adults are 1/8 to 1 inch long, cylindrical and reddish brown to black.
- Their head is tucked under the pronotum.
- The white bone into the wood to lay eggs, leaving a hole larger than 1/8 inch.
- The wood is usually less than 10 years old and must contain 6 to 30% moisture.
- They are more common in softwoods, but can attack hardwoods.

FALSE POWDERPOST BEETLES
(Bostrichidae)
- Frass is found in the galleries, coarse and tightly packed, but not in the entry holes.
- Most of the hardwoods attacked are not those commonly used for flooring, woodwork or trim.
- Generally these beetles do not re-infest wood after it is seasoned, so the damage is restricted to that inflicted by one generation.

However, the speed of damage can be very fast.
OLD HOUSE BORER (Cerambycidae)
- While nearly all of the beetles of this family attack living trees, shrubs and other plants, this beetle – the old house borer – is different. It invades milled, cured softwoods.
- It is not often that we find the adults, however. More often, we note their presence from the sound of the larvae feeding inside the timbers, the presence of oval-shaped exit holes and frass.
- The oval shaped tunnels will be 1/4 to 3/8" wide.
- The frass is a tightly-packed coarse powder.

Photo courtesy of Cardinal Products

OLD HOUSE BORER
- The key identifying characteristic of this family is the very long, slender antennae. The adult old house borer can be from 5/8 to 1" in length.
- Its color is usually brownish black to black.
- The prothorax is round in shape and has two raised shiny black bumps.
- There are two lighter gray covered bands about halfway down the wing covers.
- The head of the larva is round and much larger than the tail.

WHARF BORER (Oedemeridae)
- Finally, there is a wood-infesting beetle which is not a member of the families mentioned above.
- It comes by its name honestly; it is a common feeder in wharves, pilings and docks along the coasts. But it can be found inland, wherever wood is kept moist and, most often, in constant contact with soil.
- These beetles are ordinarily discovered when the adults emerge from the infested wood. This can be any time of the year but, in the Kansas City area, usually in May.
- The adults are about a half inch long, brown to reddish yellow. The tips of the wings are purple to black.
- Mature larvae are 2 to 3 times longer than the adult and pale brown to cream color.
- There is one generation per year.

Photo Osaka Museum of Natural History

Larder beetle/Hide beetle
- What insect did this?

What is this?
CARPENTER ANTS

There are about 24 species of carpenter ants in the United States, with at least eight in western CO and eastern UT.

- Only 3 are important pests of man's structures.
- Camponotus modoc (Western black carpenter ant) is the most important one in this area.
- They derive their name from the smooth, clean, sculpted galleries.

In the Kansas City area, carpenter ant colonies may be as large as 50,000 workers.

Colonies will have only one queen, until the colonies begin budding.

Yet, colonies can be difficult to locate because carpenter ants are basically nocturnal; most foraging is done at night.

CARPENTER ANTS

Invade structures two ways:

A. Founding queen finds a moist, secure location and begins laying eggs.
   - Eggs hatch in 2 to 3 weeks; queen tends the larvae.
   - Once those young mature, they become small, minor workers.
   - Usually only 10 to 25 workers.
   - Queen continues laying eggs and minor workers assume all colony duties.
   - If the majority of workers you see are minor workers, assume that colony is quite young.

B. A mature colony may take up residence in a susceptible structure, such as one in a wooded, moist area.
   - It may also derive from tree stumps, fence posts or landscaping timbers.
CARPENTER ANTS

HIGH WOOD MOISTURE IS THE DEVIL WE MUST COMBAT!

LOOK FOR:
- Wood to soil contact
- Where decks connect to structures
- Structures shaded and under dripline of trees
- Fascia behind guttering
- Constant wetting by sprinkler systems
- Internal plumbing leaks
- Colonies in insulated exterior walls
- Moist tree stumps, fence posts and other timbers

CARPENTER ANTS

CARPENTER BEES

Carpenter bees can, but shouldn’t be, mistaken for bumble bees.
- Males are aggressive, but can’t sting.
- Females can sting, but will not unless provoked.

CARPENTER ANTS

CARPENTER BEES

Our greatest concern is the unsightly 1/4” diameter round gallery entrance holes.

Our secondary concern is repeated gallery use which may structurally damage the wood.

CARPENTER BEES

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CARPENTER BEES

Carpenter bees attack unfinished wood of fascia boards, porch ceilings, outdoor wooden furniture, decks, railings, fence posts, utility poles, siding, shingles, dead tree limbs and other weathered wood.

- They attack all species of dried, seasoned wood, but prefer softwoods, such as cedar, redwood, cypress, pine and fir.
- Nail holes and exposed saw cuts pose attractive boring sites.

CARPENTER ANTS

The female bores a gallery hole about 1” in from the surface and then turns the gallery to follow the wood grain.

- She provisions a cell with a mixture of pollen and honey; lays one egg and seals off the chamber.
- She usually will construct 6 to 8 cells in a row.
- The life cycle from egg to adult is 30 to 40 days.
## Wood-Boring Insects

**How To Identify Them Based Upon Visible Evidence**

<table>
<thead>
<tr>
<th>Species</th>
<th>Length (mm)</th>
<th>Surface Effects</th>
<th>Boring Effects</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drywood Termite</strong></td>
<td>8-25</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Porous Wood Borer</strong></td>
<td>10-15</td>
<td>Burr holes</td>
<td>Stag beetle</td>
<td></td>
</tr>
<tr>
<td><strong>Larvae</strong></td>
<td>3-5</td>
<td>Dull eyes</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Adult</strong></td>
<td>2-4</td>
<td>Red-tipped</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Longhorn Beetle</strong></td>
<td>3-5</td>
<td>Rotted wood</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Bark Beetle</strong></td>
<td>2-4</td>
<td>Rotted wood</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Blue Stain Beetle</strong></td>
<td>2-4</td>
<td>Rotted wood</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Narrow Mouthed Borer</strong></td>
<td>2-4</td>
<td>Rotted wood</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Mastodon Borer</strong></td>
<td>3-5</td>
<td>Rotted wood</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>White Bark Borer</strong></td>
<td>3-5</td>
<td>Burr holes</td>
<td>Stag beetle</td>
<td></td>
</tr>
</tbody>
</table>

*Note: For more information, contact the presenter at 913.927.9588 or forrest@saintaubinbce.com*