

PEST
 Presented by
 Darryl E. Chandler



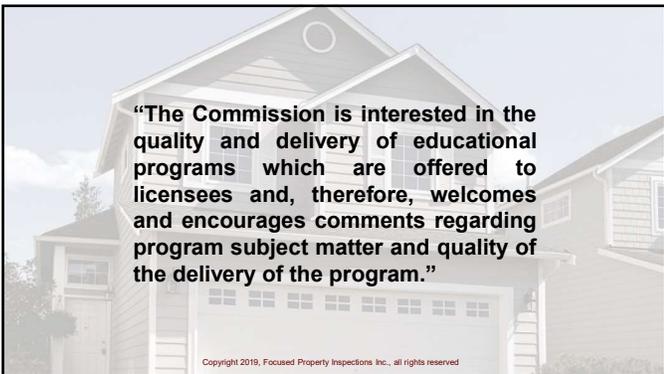
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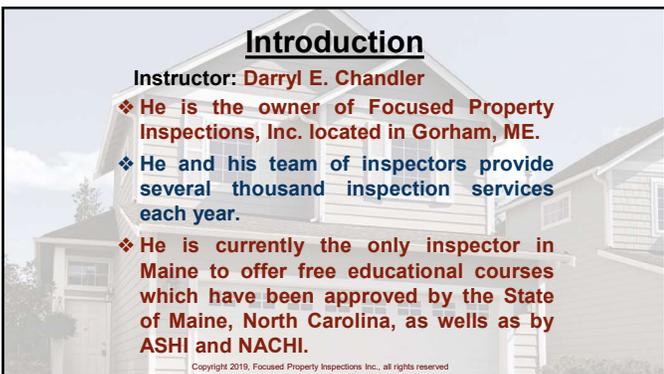
Pests and Environmental
 Hazards For Real Estate
 Professionals

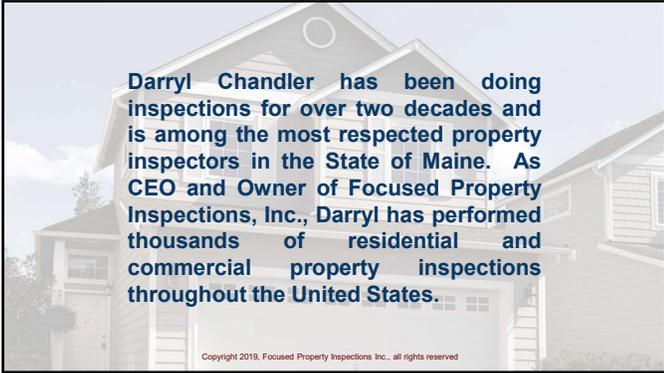
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In This Course You Will Learn:

- The Various Wood Destroying Insects
- How they defect a house
- How these Insects can enter a home
- What preventive measures you can take
- What areas of the United States they effect



Wood

- A biological material
- If protected from moisture and insect attacks, it can last for centuries
- Biological processes that decompose wood:
 - Insects that eat the wood or fungi that cause rot and decay
 - The most damaging insects that attack structural wood are termites
 - Their activity results in damage and control costs that exceed \$1.5 billions per year nationally

The termites did it!



Wood and Wood Materials

- **Soft wood**
 - Wood and lumber
 - Milled from conifer trees
 - Conifer trees are any trees which have needles and produce cones.
 - Scientifically known as Gymnosperms
 - Often used in woodworking, construction, and furniture
 - Examples
 - Pine
 - Cedar
 - Fir
 - Spruce
 - Redwood



Wood and Wood Materials

• Hard Wood

- Comes from any trees which do not produce needles or cones.
- Are most commonly known as deciduous trees, more scientifically known as angiosperms.
- Hardwoods are trees which produces leaves and seeds

• Examples:

- Ash
- Maple
- Oak
- Hickory
- Walnut
- Cherry



Wood and Wood Materials

• Engineered Wood

- Often treated through chemical or a heat process to produce a wood product which can meet certain sizes that would be difficult to achieve from nature.
- Popular examples of engineered woods include
 - Plywood
 - Oriented Strand Board
 - Medium Density Fiber Board
 - Composite Board

• Wood veneers can also sometimes be classified as engineered wood, since it often needs to be manipulated either through specialized cutting techniques or joining pieces together to achieve a specific size or wood grain patterning.





Wood Destroying Insects

• Insects that Damage wood:

- Termites
- Carpenter Ants
- Carpenter Bee's
- Wood-Boring Beetles
- Powder-post Beetles

Termites: Subterranean Termites Caste System

- Alate/Swarmer (Winged Reproductive)
- Soldier
- Worker
- Secondary Reproductive
- Mature Queen
- Secondary Queen
- King

The diagram shows seven types of termites arranged in a row. From left to right: a small worker, a larger soldier with a dark head, a reproductive termite, a winged reproductive termite with large wings, a king, a queen, and a secondary queen.

Caste Systems

- Workers take care of the foraging, care for the young, build and repair, and even defend the colony.
- The caste, which primarily defends the colony, however, is the soldier class, which protects the colony from ants and other enemies.
- The ones in the reproductive caste are known as swarmers. These swarmers are responsible for outbreeding and biological dispersal to create more colonies.
- The colony also has queens that lay eggs and produce pheromones needed for communication.

A cross-section of a wall shows a network of brown tunnels and mud tubes built by termites, extending from the ground into the interior of the wall.

Caste Systems

- Subterranean termites feed on cellulose, primarily wood, although they will eat paper and cotton.
- These termites live underground and construct tunnels to find food and water.
- In some cases, if the colony is mature enough to support itself safely, the termites might build a nest above ground in moist areas.
- During the winter, they will tunnel deeper underground to find warmth.
- The workers can build these tunnels 1in per hour.

A cross-section of a wall shows a network of brown tunnels and mud tubes built by termites, extending from the ground into the interior of the wall.

Damage

Color: Creamy Brown
Legs: Six
Shape: Long, Narrow, Oval
Size: 1/8 to 3/8 inch
Antennae: Yes
Flight: Yes
Region/Threat: ALL U.S. States Except Alaska

Subterranean Termites are by far the most Destructive Species. The Hard, saw-toothed jaws work like Shears and can bite off small Fragments of wood, one piece at a time.



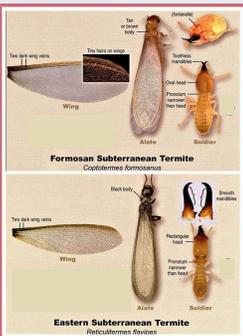
Prevention

- Avoid water accumulation near your home's foundation.
 - Divert water away with properly functioning downspouts, gutters and splash blocks
- Reduce humidity in crawl spaces with proper ventilation
- Never bury wood scraps or waste lumber in yard
- Most importantly, eliminate wood contact with the soil
 - Maintain a 12-inch gap between the soil and wood portions of the building
- Remove Tree Stumps/Limbs



Formosan Termites

- Very similar to other subterranean termite species
- Caste system
- Originally from China
- The most Voracious and aggressive and devious of over 2,000 termite species
- Larger size
- Pale yellow body color
- Oval shape of the head of the soldier



Formosan Subterranean Termite
Coptotermes formosanus

Eastern Subterranean Termite
Reticulitermes flavipes

Formosan Termites

- Alates wings are hairy range to 1/2 inch including wings
- Can do more damage much more rapidly
- This species makes nests of hardened paper-like materials in wood or on the ground
- Like the Subterranean, the Formosan builds earthen shelter tubes over objects it cannot penetrate

Damage

Color: Yellowish Brown
 Legs: Six
 Shape: Long, Narrow, Oval
 Size: 1/2-inch in length
 Antennae: Yes
 Flight: Yes
 Region/Threat: Alabama, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, N. Carolina, S. Carolina, Tennessee, Texas, and Virginia.

Because of their Aggressive nature Formosan Termites are hard to control once they infest a structure. Prevention is key.

Prevention

- Same as Subterranean Termites:
 - Avoid water accumulation near your home's foundation
 - Reduce humidity in crawl spaces with proper ventilation
 - Maintain a 12-inch gap between the soil and wood portions of the building

Prevention

- To help avoid Drywood termite infestation, make sure firewood and scrap wood is stored at least 20 feet from the home.
- Drywood termites form new colonies by gaining access to wood through small holes, seal all cracks and crevices in a structure.

"Please hire a Licensed Professional to handle Insecticide's"

Damp wood Termites

- Caste system
- Found in logs, stumps, dead trees, fence posts and utility poles
- Do not usually infest structures because of their need for excessive moisture. However, care must be taken to avoid attracting damp wood termites to a structure, as they can cause serious property damage.
- Colonies, like drywood termites, have no worker caste. The nymph damp wood termites take care of the kings and queens of the colony and feed the soldier caste.
- These termites create a series of chambers in wood, which are connected by tunnels with smooth walls, as if sandpapered.



SUBTERRANEAN TERMITES
Subterranean termites live underground and build nests in soil and dirt. They will construct tubes up the sides of your home to get to the wood of your house.

DRYWOOD TERMITES
Drywood termites nest in the wood they eat. They produce excrement called "frass" and kick it out of their nests, leaving behind small piles of what looks like fine sand.

DAMPWOOD TERMITES
Dampwood termites only feed on damp wood and are found in basements and areas where the ground in your home is moist. They keep their nests inside of the wood.

Damp wood Termites

- As the name suggests, damp wood termites infest wood with high moisture content.
- Normally larger in size than other termite species.
- King and queen range have two pairs of wings that equal in size and shape and extend beyond their bodies.
 - Wings are light to dark brown, heavy veined and leathery in appearance.
- Swarming usually occurs at dusk.
 - Peak annual swarming takes place in the late summer and fall.
- Locate their colonies in damp, often decaying wood, but once established, they can extend their activities into sound and relatively drywood.



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Damage

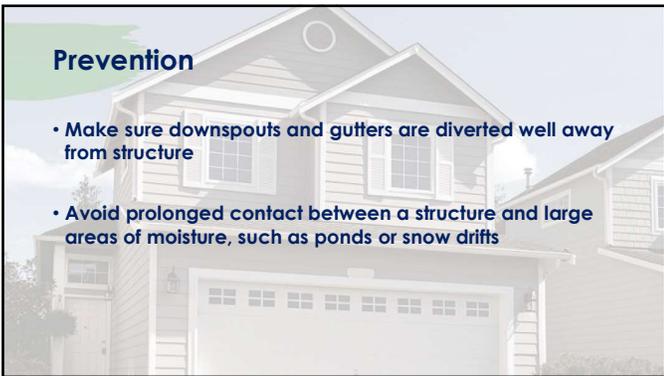
Color: Yellow to honey Brown
Legs: Six
Shape: Long, Narrow, Oval
Size: 1/2 inch to 5/8 Inches
Antennae: Yes
Flight: Yes
Region/Threat: Washington, Oregon, California, Nevada, Idaho, Montana and Florida.

They are occasionally responsible for serious damage to wooden structures.



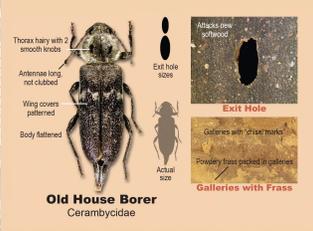
Prevention

- Make sure downspouts and gutters are diverted well away from structure
- Avoid prolonged contact between a structure and large areas of moisture, such as ponds or snow drifts



Old House Borer Beetle

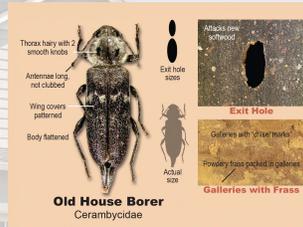
- Despite its name, the old house borer is found more in houses less than 10 years old.
- The Larvae feed in the sapwood portion of seasoned softwoods, such as pine, spruce, and fir.
- The old house borer is different from most other wood-infesting beetles. It can survive in relatively drywood, having a moisture content as low as 10%.
- The old house borer will infest wood in conventional "stick-built" homes as well as log homes.



Old House Borer
Cerambycidae

Old House Borer Beetle

- Old house borer larvae initially infest wood, female beetles lay eggs in stacked lumber awaiting use.
- The eggs hatch in about a week and tiny larvae bore into the wood to begin feeding.
- When larvae are nearly mature, its not unusual to hear them feeding, making a rasping sound as they chew.
- Feeding sounds are usually heard during the months of April-October.



Damage

- Color:** Brownish black to black with some specimens appearing dark gray; yellowish-gray hairs on heads.
- Legs:** Six
- Shape:** Oval
- Size:** 5/8 to 1 inch long with males being smaller
- Antennae:** Long, Thin Antennae that are as long (or longer) than the body of the beetle.
- Flight:** Yes
- Region/Threat:** Mainly found in the eastern half of the U.S. They are commonly found in new construction and in untreated pine logs used in log homes.



Prevention

- Early signs of old house borer infestation are extremely difficult to detect.
- Infested wood is often used in construction as there are no external signs of infestation.
- Larvae seldom break through the surface, even though the interior of the wood may be severely damaged.
- If the infestation is active, a professional pest control operator should be contacted.

Anobiid Beetle
(Powderpost Beetle, Death Watch Beetle, Furniture Beetle)

- The Most obvious sign of infestation is the accumulation of powdery frass and tiny pellets underneath infested wood or streaming from exit holes.
- Anobiid frass is powder-like and gritty. The exit holes are round and vary from 1/16 to 1/18 inch in diameter.
- A way to differentiate the holes of lyctines from anobiids is to insert a "click-type" retractable ballpoint pen into the exit hole. Only the tip of the pen will fit through a lyctine emergence hole.
- If the hole was made by an anobiid, the tip of the pen will enter part way up the angled face of the point.
- If there are large numbers of holes and the powder is bright and light-colored like fresh sawed wood, the infestation is both old and active.



Damage

Color: Reddish-Brown to nearly black
Legs: Six
Shape: Slender, Cylindrical body covered with fine hair
Size: 1/16 inch to 1/4 inch
Antennae: Yes
Flight: Yes
Region/Threat: throughout the U.S.

Anobiids prefer to infest wood that is damp. Attacks often start in poorly heated or ventilated crawl spaces and spread to other parts of the house.

Infestations rarely occur in houses on slab Foundations.

Wood moisture levels below 13% (during Spring and Summer) are generally unsuitable for Anobiid development/reinfestation.



Prevention

- Install a moisture barrier in the crawl space of infested buildings and increase ventilation.
- If the infestation appears to be localized (e.g. Only a few holes in a board or sheet of paneling), replace the boards or sheet of paneling.
 - If additional holes begin to appear in adjacent areas, additional action can then be taken.



**Bostrichid Powder Post Beetle
(Large Powder Post beetle, Bamboo Borers)**

- Considered to be less important economically than the other two groups of powder post beetles.
- Are normally found infesting hardwoods.
- The first signs of infestation are circular entry holes for the egg tunnels made by the females. The exit holes made by adults are similar but are usually filled with frass.
- The frass is fine to coarse and contains no pellets. It is tightly packed in the tunnels and does not sift out of the wood easily.
- The frass tends to stick together. They are most important as pests in hardwood, and those species that attack conifer wood rarely cause serious damage.



Damage

Color: Reddish-brown to black
Legs: Six
Shape: Cylindrical body with a roughened thorax with head directed downward
Size: 1/32 inch to 3/8 inch
Antennae: Yes, with a club of 3 distinct segments
Flight: Yes
Region/Threat: Throughout the U.S.



Bostrichid rarely cause significant damage in framing lumber and primarily affect individual pieces of hardwood flooring or trim.

Many of the species do not reinfest wood after it is seasoned, so the damage is limited to that inflicted by one generation, though that can be considerable.

Prevention

- Replacement of structurally weakened members is usually the most economical and effective control method.



Lyctine Powder Post Beetle (True Powder Post Beetle, Lyctid, Lyctus Beetle)

- Beetles belonging to the Lyctinae family are often known as "true powder post beetles".
- These beetles are only of importance to hardwood products, as they will lay eggs on softwoods.
- The first generation of beetles to emerge will leave circular exit holes 1/32 to 1/16 inch in diameter depending on species.
- The presence of small piles of fine, flour-like frass falls easily from wood rather than being packed in as in both anobiids and bostrichids there are no pellets in the frass.
- Damage by Lyctine beetles is limited to the sapwood. The sapwood may be completely to frass in severe cases.

True Powderpost Beetles
Lyctidae

Damage

Appearance: Flattened, Slender, Reddish Brown to black
Legs: Six
Size: 1/32 to 1/4 inch in length
Antennae: Yes
Flight: Yes
Region/Threat: There are several Lyctine/lyctid Powder post Beetles found throughout the U.S. They are relatively common in all parts of the country, but more of a concern in the south.

They can infest wood with a moisture content between 8 to 32%. Greatest activity occurs with 10 to 20%.

Prevention

- Most infestations are present in wood before purchase; therefore, prevention and control should begin at the lumber mill and where wood products are stored and manufactured.
- Once an infestation has been discovered, there are control measures to eliminate and prevent reinfestation such as painting the surface of infested wood or employing a professional to use an insecticide or fumigant.

Carpenter Bee Subfamily Xylocopa

- The Carpenter Bee resembles bumblebees, but can be distinguished by their shiny, black, hairless abdomens.
- The thorax is covered with hairs that are bright yellow, orange or white. The upper-side of the abdomen is black, shiny and bare.
- The female has a black head, and the males have white markings on the head.
- Structural damage caused by one or two is slight. However, tunnels may be used again and again and lengthened by other broods.
- The activity of numerous bees over a period of years is sure to cause some structural damage.

The infographic includes a central image of a Carpenter Bee with labels: 'Exit hole size', 'Yellow or dark hairs', 'Divided galleries', 'Attacks dry, exposed wood', 'Actual size', and 'Smooth, hairless abdomen'. Below the main image is the text 'Carpenter Bees Xylocopa'.

Damage

CARPENTER BEE **BUMBLE BEE**

Appearance: Resembles bumblebee, but larger and Abdomen is shiny, black and hairless.

Legs: Six

Size: 3/4 inch to 1 inch

Antennae: Yes

Flight: Yes

Region/Threat: Throughout the U.S.

Carpenter bees are basically nuisance pest but can cause damage over time. However old galleries may be enlarged by bees- eventually resulting in considerable wood damage.

The image shows a Carpenter Bee and a Bumble Bee side-by-side. Below them is a close-up of a hole in wood with a dark, hollowed-out interior.

Prevention

- Nail holes, Exposed saw cuts, and unpainted wood are attractive starting points for boring.
- Painted wood is rarely attacked by carpenter bees, so keep all exposed wood surfaces well painted.
 - Wood stains will not prevent attacks.
- Wood pressure treated with a Preservative should be used if painting is not practical.

Carpenter Ants

- Carpenter Ants have a system much like the termites. They have workers who are known for foraging food.
- Swarmers usually are produced when the colony matures and is ready to form new colonies.
 - These winged individuals often indicate a well-established colony.
- Carpenter ants build nests, they dig out tunnels in wood, weakening it from the inside.
- A long-term infestation with multiple colonies in a home often means serious structural damage and unsightly cosmetic damage.
- Homes with moisture issues caused by leaks are prime targets for carpenter ants.
- The pests will also use tree branches that overhang roofs as a bridge, accessing buildings to find a way inside. Unsealed openings around utility pipes and wires are common entry points.

The Physical Differences Of Pests

CARPENTER ANTS	FIRE ANTS	TERMITES
1. Bent Antennae	1. Red In Color	1. Palps Present
2. Long Narrow Thorax	2. Stinger Present	2. Straight Antennae
3. No Stinger	3. Two Mandibles	3. Soft Abdomen

Damage



Appearance: Body may be black, red, tan, yellow, or some combination (typically dark brown to black).

Size: Varies from 1/4 inch (small worker) Queen to 3/4 inch

Legs: Six

Antennae: Elbowed

Flight: Yes (winged Reproductive)

Region/Threat: Swarmers emerge usually from May until August in the eastern United States and from February through June in the west.

The nest is associated with a moisture content of greater than 15% a situation often caused by rain, leaks, condensation.

Nests can be found inside or outside of a building.

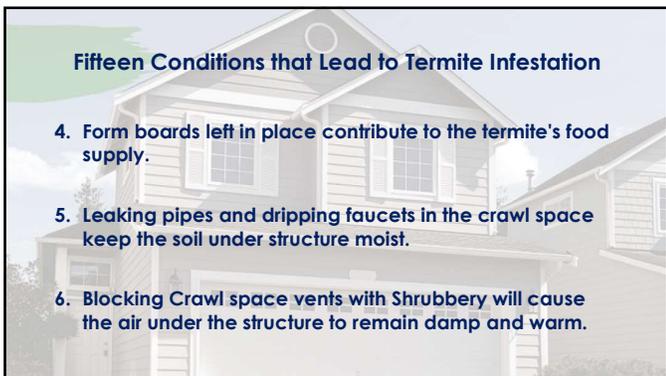
Prevention

- Houses near wooded areas are especially subject to invasion.
- Carpenter ants are usually found near moisture. Examine any areas where wood is in contact with soil.
- If nests are located inside, remove and replace infested structural wood.
- Stop the intrusion of moisture, caulk and screen actual and potential ant entryways, ventilate area where moisture accumulates, regrade where necessary, repair roofing, gutting and recommend trimming trees where branches touch a structure or overhang roofs
- Tree removal may be necessary.



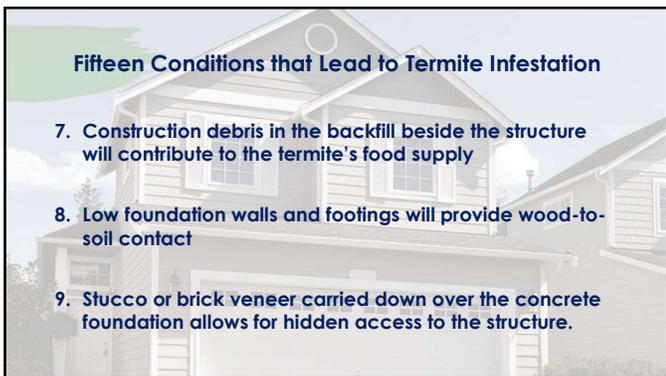
Fifteen Conditions that Lead to Termite Infestation

1. Cracks in concrete foundations and open voids in concrete foundations are hidden avenues of entry.
2. Any wooden posts or supports set in concrete may be in contact with soil underneath.
3. Concrete porches with earth fill may provide wood-to-soil contact.



Fifteen Conditions that Lead to Termite Infestation

4. Form boards left in place contribute to the termite's food supply.
5. Leaking pipes and dripping faucets in the crawl space keep the soil under structure moist.
6. Blocking Crawl space vents with Shrubbery will cause the air under the structure to remain damp and warm.



Fifteen Conditions that Lead to Termite Infestation

7. Construction debris in the backfill beside the structure will contribute to the termite's food supply
8. Low foundation walls and footings will provide wood-to-soil contact
9. Stucco or brick veneer carried down over the concrete foundation allows for hidden access to the structure.

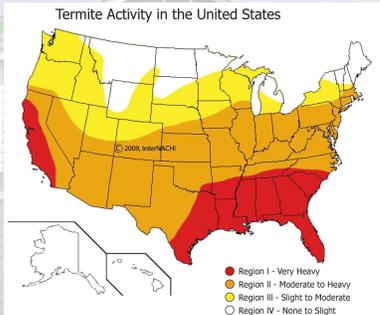
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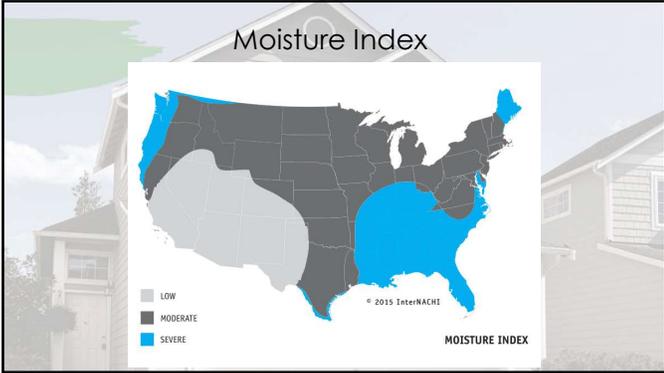
- 10. soil-filled planters built up against the side of the structure allow direct access into the foundation cracks.
- 11. Forms left in slabs, where plumbing drains enter the structure, provide access.
- 12. Wooden porch steps in contact with the soil are entry points.

Fifteen Conditions that Lead to Termite Infestation

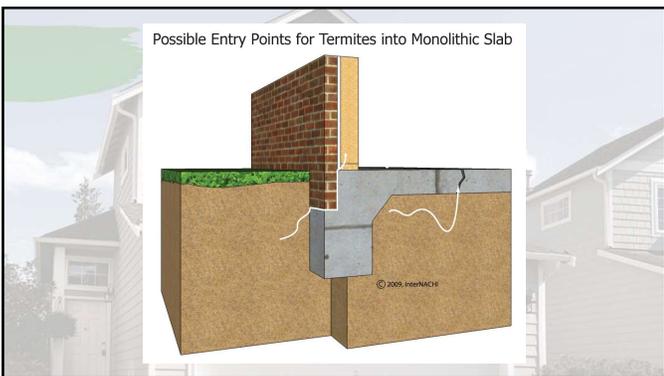
- 13. Heating units in crawl spaces maintain warm soil temperatures for termite colonies year-round.
- 14. Paper is a wood product. Paper collars around pipes and ducts also provide access to the structure.
- 15. Wooden fences, trellises and other wooden adornments up against the side of the structure may provide access.

Termite Activity in the United States

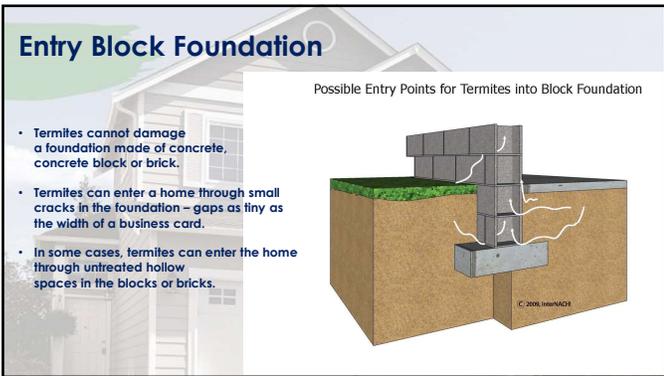


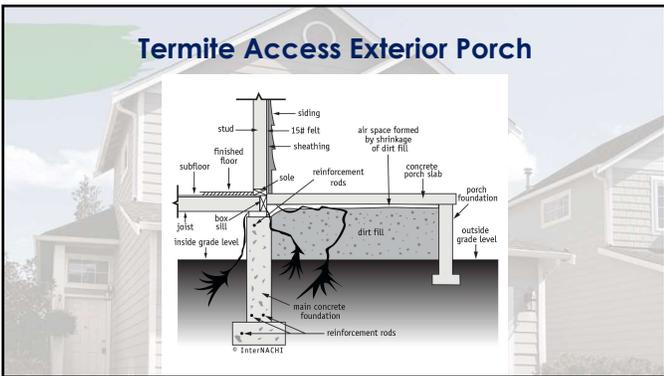


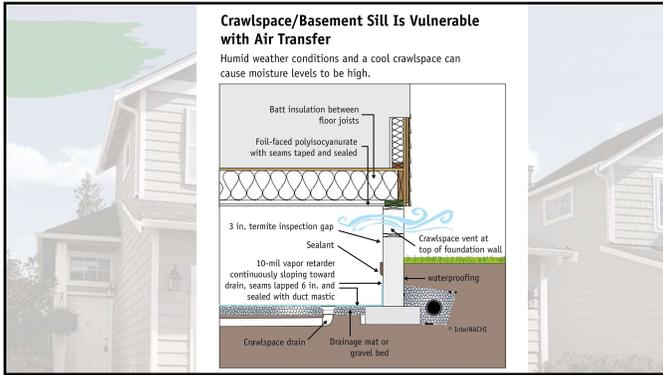


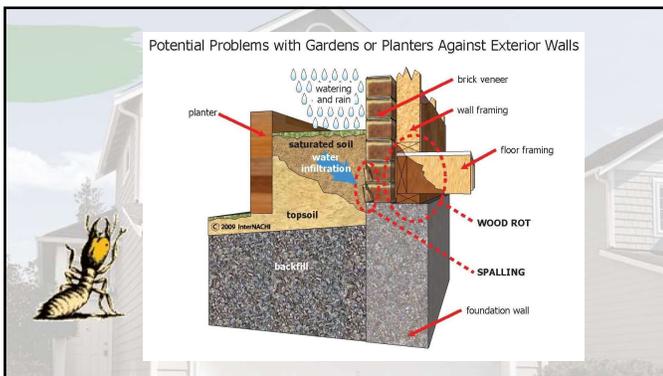


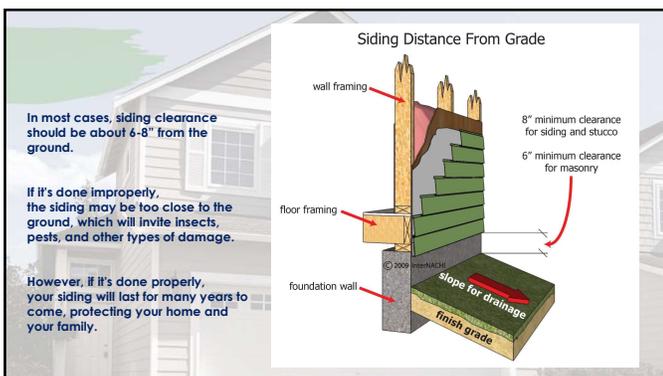




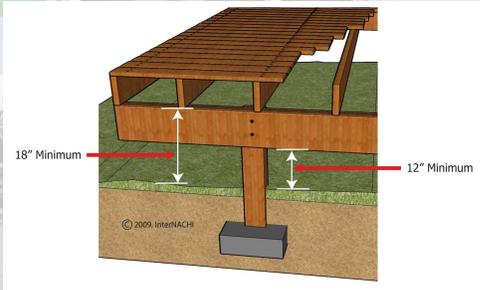




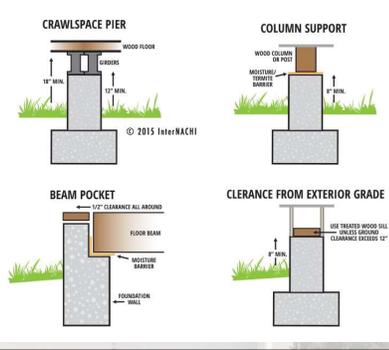




Minimum Distance to Soil Untreated Lumber



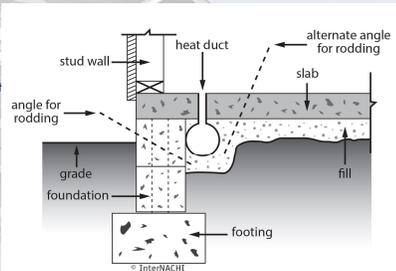
Crawspace Standards

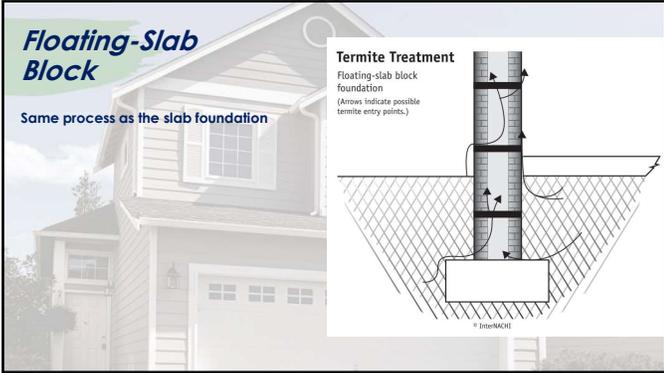


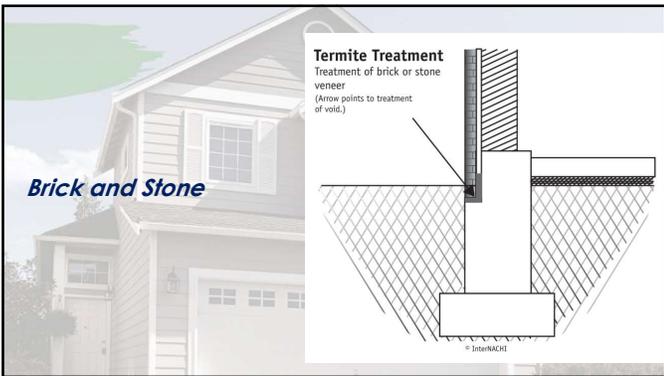
Slab Foundation

A "slab" is a type of concrete foundation that does not have a basement or crawspace.

To control a termite infestation underneath the slab, a pest control professional typically will recommend a termiticide treatment that can be applied through rods reaching under the house or holes drilled in the slab.









Page 3

In some States: Drawing of the exterior of the house and the areas of active infestation

Page 4

Real Estate Transactions and Termite Damage

- Findings of termites can make or break a sale
- If the home inspection reveals high moisture areas, including mold, a termite inspection is a must!
- Always recommend a termite inspection
 - A small investment to avoid costly repairs in the future



Real Estate Transactions and Termite Damage

- Any home is at risk, New and Old
- Damage is not often covered by Homeowner's insurance
- Most companies offer a service commitment to retreat at no additional cost or pay for future repairs
- Paying for the inspection is often the seller and getting one completed pre-listing can provide the buyer with peace of mind



Real Estate Transactions and Termite Damage

- Some mortgages have rules and requirements:
 - VA Loans
 - FHA Loans
- The buyer is not allowed to pay for the inspection and proof is required
- Termite remediation rules
- Appraisals can also be affected by signs of termite infestation and damage



Real Estate Transactions and Termite Damage for Sellers

- Be prepared to offer infestation history as part of the disclosures
- Termite Warranties
- If an inspection reveals an infestation, the costs for remediation or repair can be huge!
- Additional contingencies may be put in place due to the results of the inspection

Real Estate Transactions and Termite Damage for Buyers

- Not all signs are from current infestations
- Depending on the area, minor termite problems are common
- Termite Control Agreements or Guarantees
- Price Negotiations



Questions?



Additional CE Classes

- | | |
|---|--|
| • Air Quality Testing for Real Estate Agents 2hrs | • New Home Construction Real Estate Agents 3hrs |
| • Avoiding the Aggravations of Home Inspections 3 | • Pests and Environmental Hazards For Real Estate Professionals 3hrs |
| • Common Issues Found 3hrs | • Radon and the Real Estate Transaction 2hrs |
| • Kitchen and Bath Appliances: What Real Estate Agents Need to Know 2hrs | • Residential Water Testing for Real Estate Agents 2hrs |
| • Home Inspections 101 3hrs | • Septic Systems 101 3hrs |
| • Lead Safety: For Real Estate Agents 2hrs | • The 10 Most Common Home Defects: For Real Estate Professionals 2hrs |
| • Managing the Home Inspection 2hrs | • The Basics of Heating Systems: For Real Estate Agents 2 |
| • Millennium Homes: For Real Estate Agents 2hrs | • Understanding Residential Electrical Inspections: For Real Estate Agents 2hrs |
| • Mold: What you Need to Know About Mold and How to Read Air Sampling Reports 2hrs | |
