



**Recognition of Wood Decay Fungi
and their damage**

Goals of this presentation:

For you to be able to:

recognize non-decay fungi (those that are present in wood but that do not damage the structural integrity of the wood) **and wood decay fungi** (which impact the structural integrity of wood, weakening its ability to provide support).

detect conditions which contribute to excess moisture in the crawl

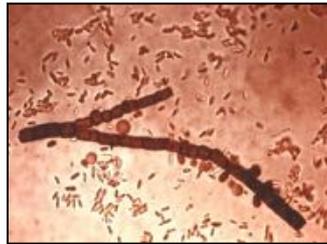
provide control methods which will prevent or correct wood decay in structures in compliance with the Rules of the Georgia Structural Pest Control Commission.

Some Fungus Terminology

- First, let's learn a little about fungi to be able to recognize some common types of fungi and the effects they might have on wood that we find in the crawl space of homes.



spores



hyphae



mycelia



rhizomorph

These are microscopic

These can be seen with the naked eye

- **Spores** are like microscopic seeds. They are produced by sporophores, or fruiting bodies of fungi. When these asexual spores germinate, they form hyphae.



- **Hyphae** are root-like, long, branching, filamentous cells (microscopic strands) that grow from the spores and feed on wood.



- **Mycelia** are a mass, group or bundle of branching hyphae. They appear like spiderwebs.

- Fungi reproduce asexually by microscopic seed-like spores which float on air currents and attach to wood.
- Spores of **surface molds and mildews** that are present on the wood germinate when wood contains **at least 20% moisture**, but these non-decay fungi don't structurally damage the wood.
- Spores of **wood decay fungi** begin to germinate and grow hyphae which damage wood when the wood has **at least 28% moisture**.



So...

let's look at the 2 types of fungi that we often see in crawl space homes:

- **non-decay fungi** which do not impact the structural integrity of wood

and

- **wood decay fungi** which do impact the structural integrity of structural wood)

A non-decay fungi

- is a plant-like organism that lacks chlorophyll and uses starches, sugars, proteins, and/or fats in wood storage cells in for food.



It does not impact the structural integrity of wood!

Non-Decay Fungi

(start developing at 20% moisture levels or > in wood)

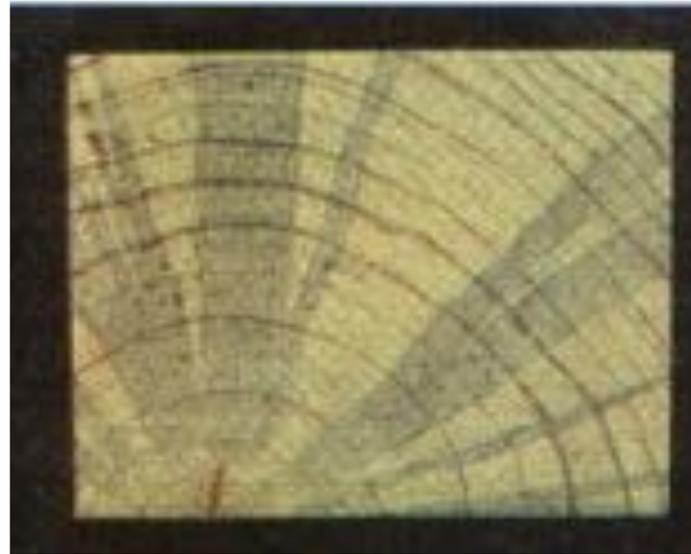
1. **Surface-staining fungi** - Molds and Mildews
2. **Sap-staining fungi** – Blue stain fungi (occur in live trees)

They use starches, sugars, proteins, and/or fats in wood storage cells in for food. They don't use cellulose, hemicellulose or lignin in the cell walls for food and, thus, they do not affect the structural integrity of wood.

Non-decay Fungi



Surface-staining fungi
(Molds & Mildews)



Sap-staining fungi
(Blue stain fungi)

A wood decay fungus

- is a plant-like organism that lacks chlorophyll and uses **cellulose**, **hemicellulose** and/or **lignin** in the cell walls of wood for food.



It may impact the structural integrity of structural wood, resulting in a reduction of its strength

First, let's recognize 2 wood decay fungi that develop only in live trees or logs:

(start developing at high moisture levels in wood of live trees or logs)

1. White Pocket Rot



2. Pecky Rot



No control is needed of these wood decay fungi in structural wood

White Pocket (Pock Rot)

- Attacks live trees, not dry structural wood of homes
- It creates small cavities that look like pock marks
- The cavities are filled with white cottony fungus
- When the lumber is cut, the fungus dies, but its evidence remains



- **No control is required**, as the fungus is already dead in structural wood

White Pocket Rot





White Pocket Rot

This is a split section of a pine tree with white-pocket rot caused by *Phellinus pini*. The white areas are de-lignified zones where the fungus has been removed lignin but not the cellulose. White-pocket rot fungi cause a selective attack on lignin and hemicellulose in wood.

Pecky Rot

- Attacks live trees, especially cypress & cedar, not dry structural wood of homes
- It creates channel-like cavities filled with soft, decayed wood
- When the lumber is cut, the fungus dies, but its evidence remains
- It often costs more than sound lumber due to its “rustic” look.



- **No control is required**, as the fungus is already dead in structural wood

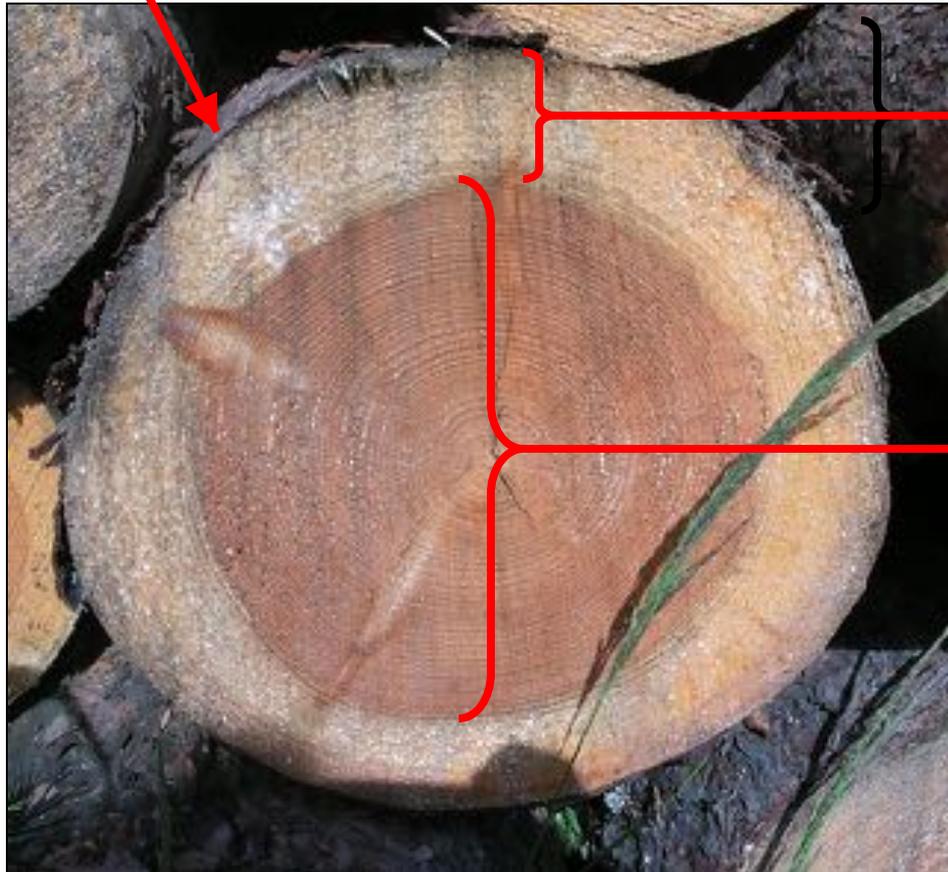
Pecky Rot

- Pecky cypress is used as panneling, flooring, and even as beams inside homes
- It may take as many as 125 years to develop inside cypress trees



Before we talk about wood decay... let's learn a bit about wood

bark

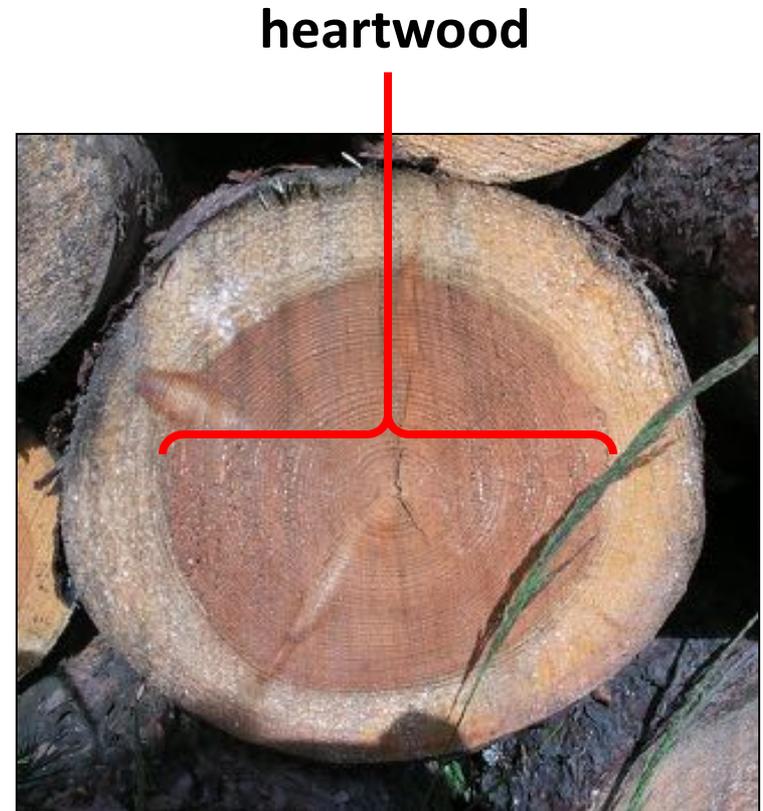


sapwood

heartwood

Resistance to wood decay

- Heartwood is the darkened wood located at the center of the log.
- It is comprised of old cells that have died and darkened.
- The darkening is caused by chemicals...some of which provide degrees of durability or **resistance to decay**...and some even to attack by some termites and beetles.
- Heartwood of **cedar, black locust, walnut, redwood, cypress and white oak** contain chemicals that make it resistant to decay.



Sapwood has no significant resistance to wood decay



sapwood

- During the growing season, new cells are produced just beneath the bark. These living cells form sapwood.
- In the spring, growth is rapid and the cell walls are thin. The summer growth cells are produced more slowly and are more compact. The difference in appearance forms the annual rings.
- The cells in the sapwood are living and transport the sap up the tree.

**So, what are the growth requirements
for
wood decay fungi?**

There are 4 growth requirements for wood decay fungi

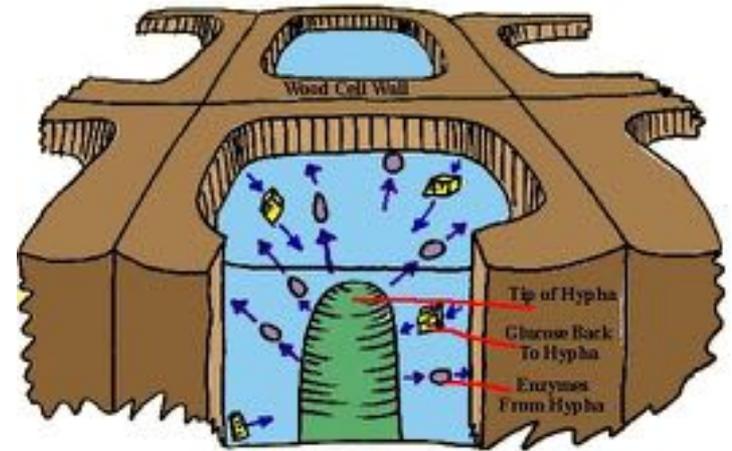
- **Wood**
- **Moderate temperatures**
- **Oxygen**
- **Moisture**

The growth requirements for Wood Decay Fungi

1. **Wood** (a food source) – cellulose, hemicellulose and lignin that compose the cell walls of plants serve as food for wood decay fungi
2. **Moderate temperatures** – optimum temperatures for growth of fungi are between 60 and 90 degrees F.
3. **Oxygen** – air is seldom a limiting factor for fungal growth unless it's submerged in water or buried several feet underground.
4. **Moisture** – the control of the moisture in wood is the most important principle in the control of wood decay. **Wood will not decay below the fiber saturation point (the point at which wood cell walls will not absorb more moisture).** The FSP of most woods ranges between 20 to 35% moisture (GA DOA – 28%). Molds and mildews can start to occur on wood with 20% moisture levels or greater in wood; therefore, their presence is a good indicator that the structure has excess moisture and needs to be controlled. Keeping wood moisture levels below 20% provides a good safety margin for wood decay.

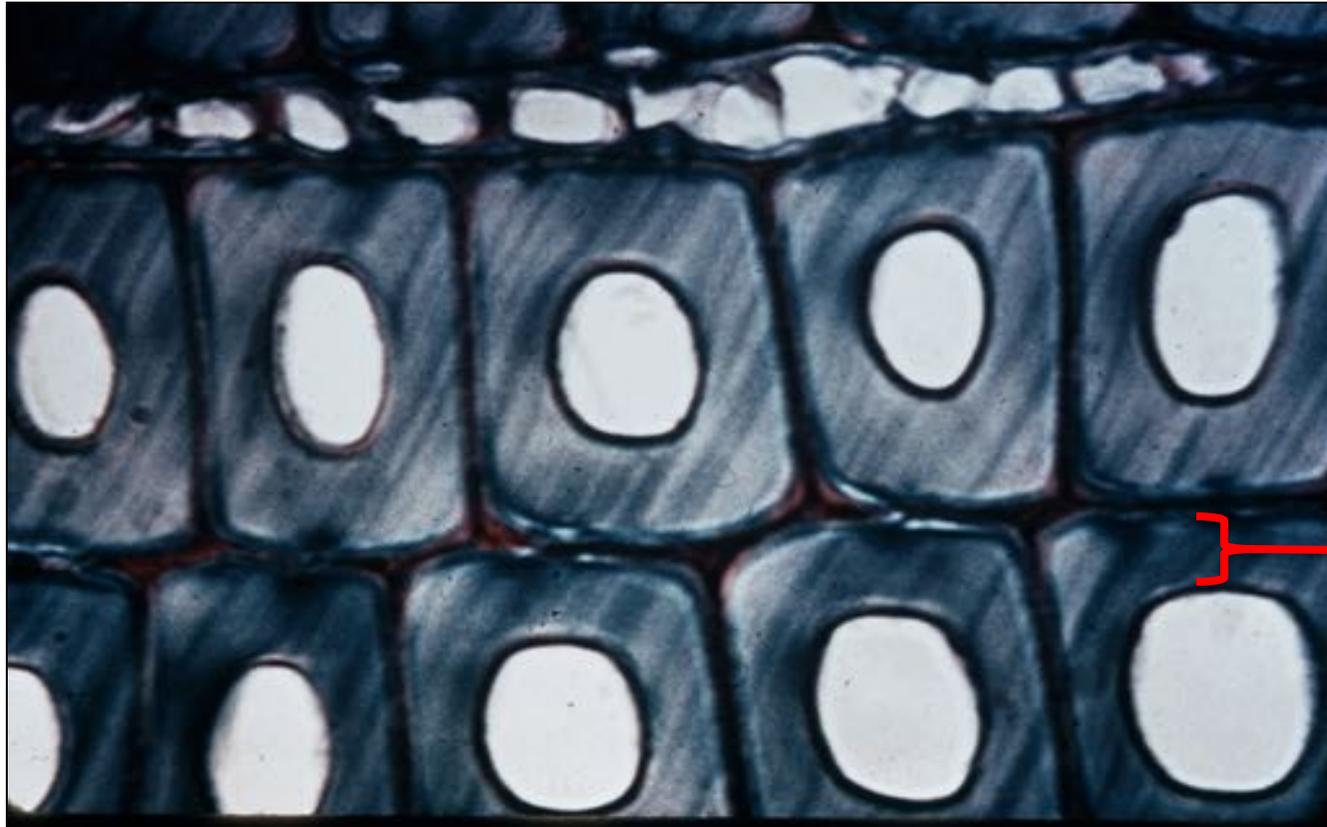
**So, how do wood decay fungi impact
the structural integrity of wood?**

How do wood decay fungi cause decay in structural wood?



- The way that fungi cause decay is through the action of enzymes secreted at the tips of hyphae of wood decay fungi. These enzymes attack the linkages between sugar units that comprise cellulose and hemicellulose, thereby liberating the constituent sugars and making them available as that might be liberated travel back to the tip of the hyphae, without a film of liquid water. The water serves as a transport medium, and without it wood cannot decay.

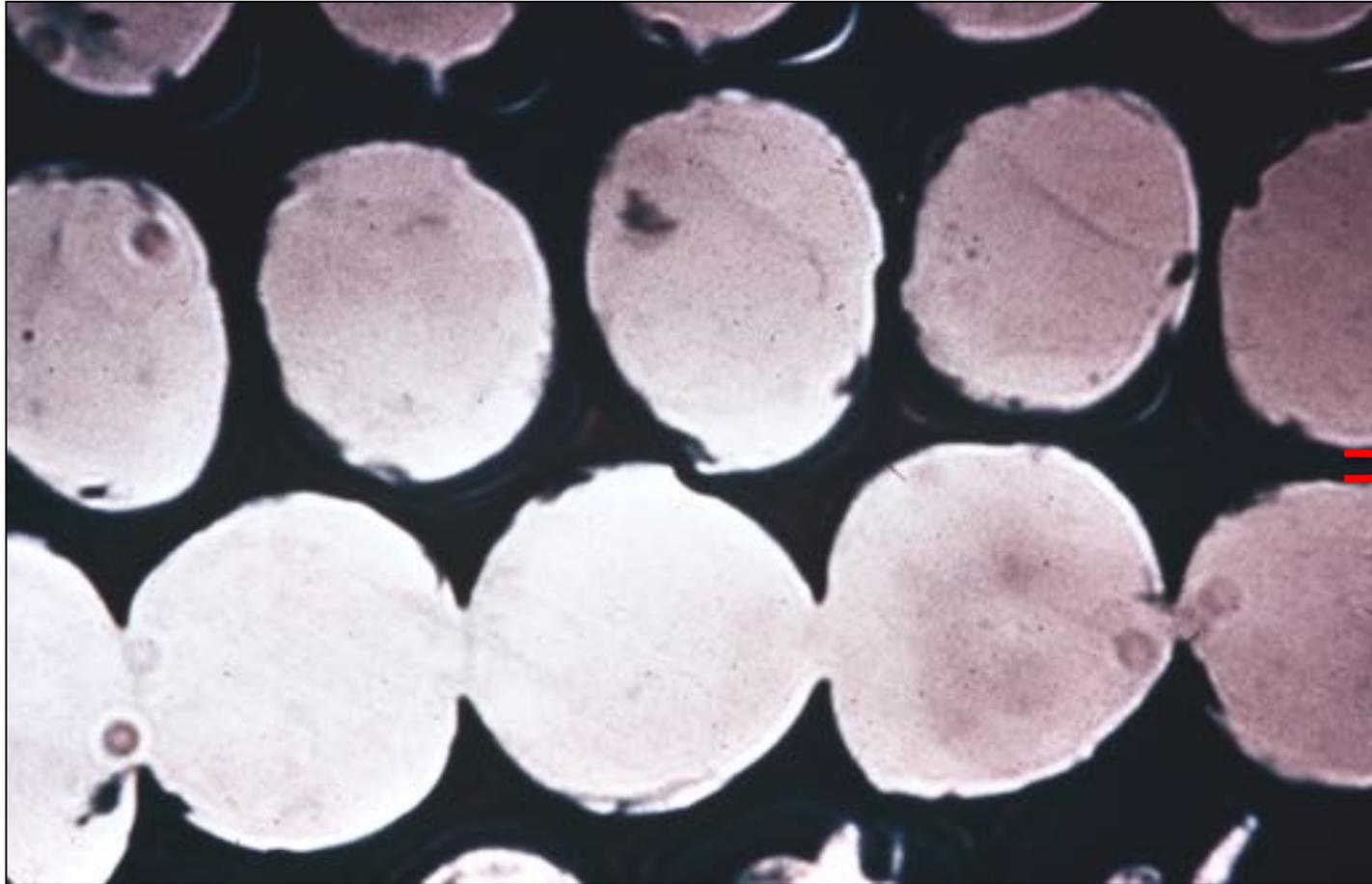
Normal cell walls of sound wood



Thickness
of cell wall

Healthy cell walls are thick! Cellulose, hemicellulose and lignin give the cell walls rigidity and give wood strength.

Wood cells are thinner after attack by wood decay fungi



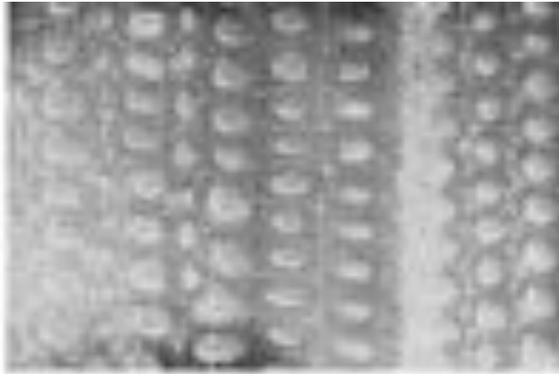
Thickness
of cell wall

Notice how thin the cell walls have become!

Photomicrographs of sound & brown-rotted pine showing effects of moisture condition & decay on the cell size of wood

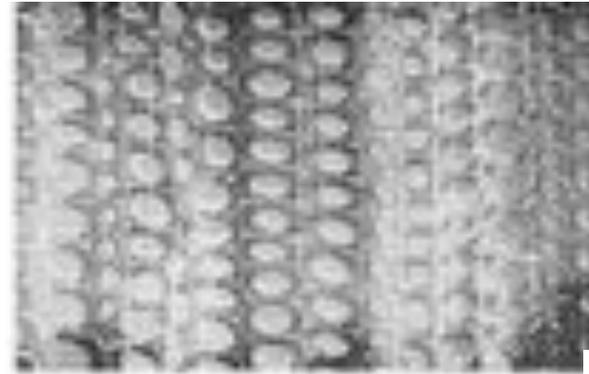
A

Sound pine
(H₂O saturated)



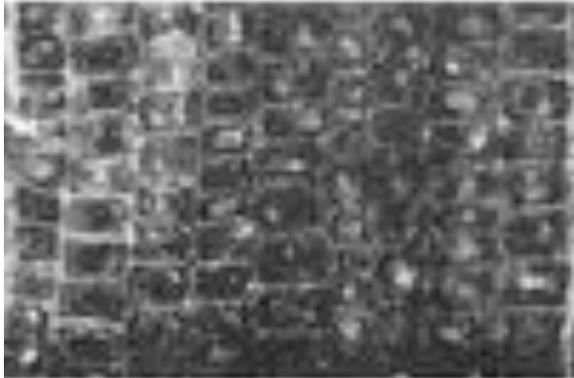
B

Sound pine
(Air-dried)



C

Brown-rotted
pine
(H₂O saturated)



D

Brown-rotted
pine
(Air-dried)



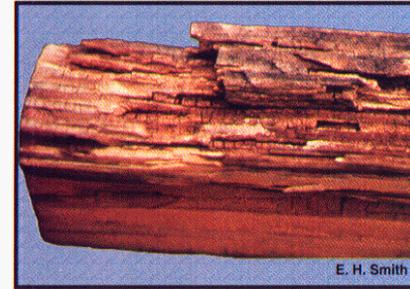
- A** Block of sound pine (water-saturated condition) – note swelling of cell walls
- B** Same block after air-drying. The size of the cells have diminished only slightly.
- C** Block of brown-rotted pine with residual weight of approximately 50 percent. Shows little difference in size of cells compared with those of sound pine in water-saturated condition.
- D** Same block after air-drying. Thickness of cell walls has diminished greatly as has size of cells from those in water-saturated condition and both have diminished more than in the air-dried sound block.

Recognition of Wood Decay Fungi

That attack the structural wood of homes

(start developing at 28% or > moisture levels
In buildings and require control)

1. **Brown rot fungi** - attacks softwoods



2. **Water conducting rot fungi**

(*Poria incrassata*)

attacks softwoods & hardwoods,
even woods that are normally
resistant to brown rot and white rot



3. **White rot fungi** - attacks hardwoods



Brown Rot Fungi – found in softwoods only

- Damaged wood is dark brown to black in color (it appears charred or burned)
- When pinched between fingers...it feels like sawdust
- There is abnormal shrinkage of the wood
- Cracks form across the grain of the wood forming cubes (called “checking”)
- It often develops in wet/dry/wet/dry situations



Brown Rot Fungus

- It causes considerable loss in wood strength very early in the decay process, often before decay characteristics are seen.
- Cell wall carbohydrates (cellulose and hemicellulose) are degraded extensively during decay leaving a modified, lignin-rich substrate.
- Commonly, brown rot causes decay in structural wood of buildings where large losses of wood strength often result.

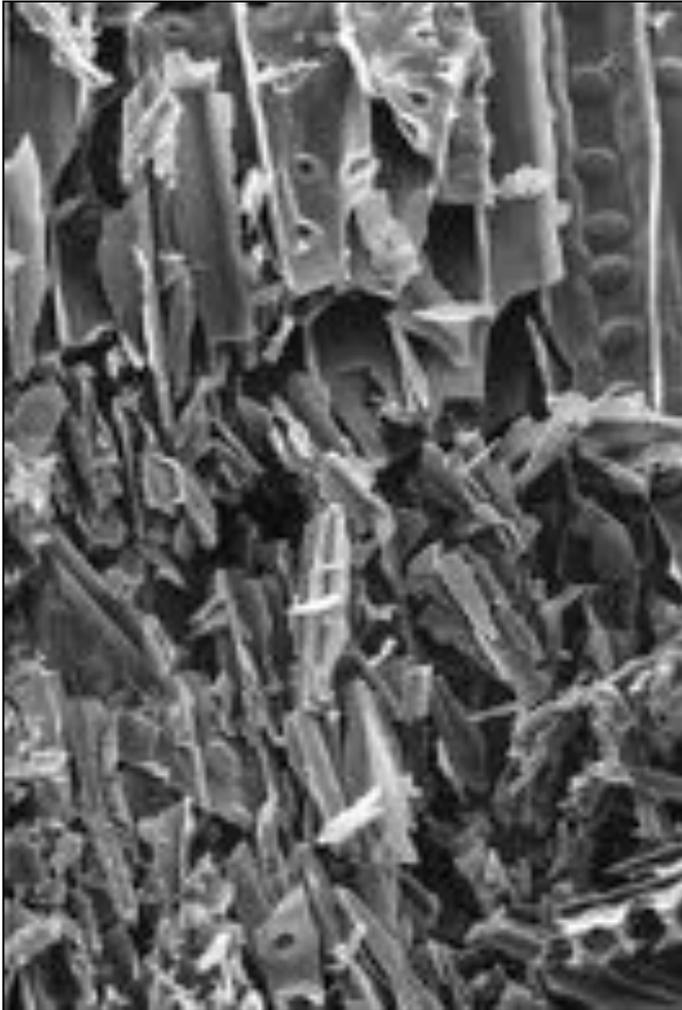


Brown Rot Fungi

- In the advanced stage of brown rot decay, the softwood cracks perpendicular to the grain of the wood and “checks” into cubicle pieces (**cubicle brown rot**).
- Little to no integrity remains in this decayed wood.
- Commonly, it’s called been **dry rot**.
- This term is misleading because moisture must be present for the decay to occur.



Wood impacted by Brown Rot at the cellular level



- This scanning electron micrograph of brown-rotted wood shows the wood cell walls crumbling into minute fragments .

White Rot Fungi – found only in hardwoods

- Wood that is newly infested by white rot fungi is bleached white in color and has dark lines running through it, although little damage occurs in early stages of white rot decay.
- There is no abnormal shrinkage of the wood
- It can digest cell wall components, including hemicellulose and lignin

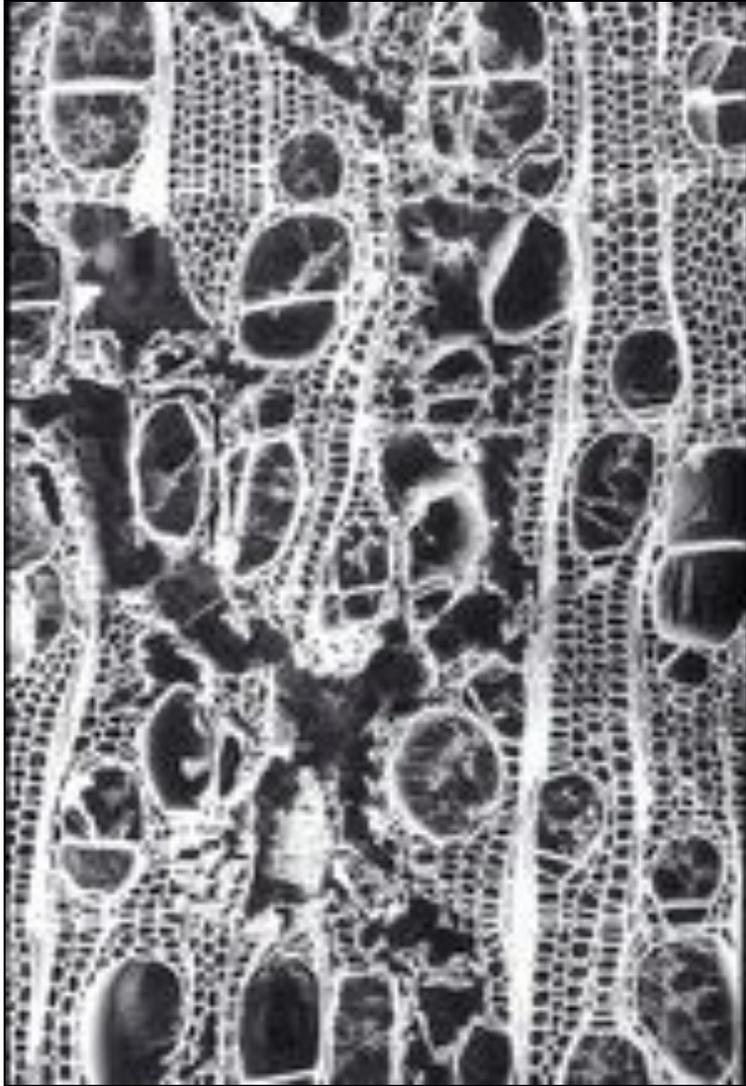


Late Stages of White Rot Decay



Damaged wood is **fibrous** and **spongy** when old and may produce a very “**musty odor**”

White Rot Fungi

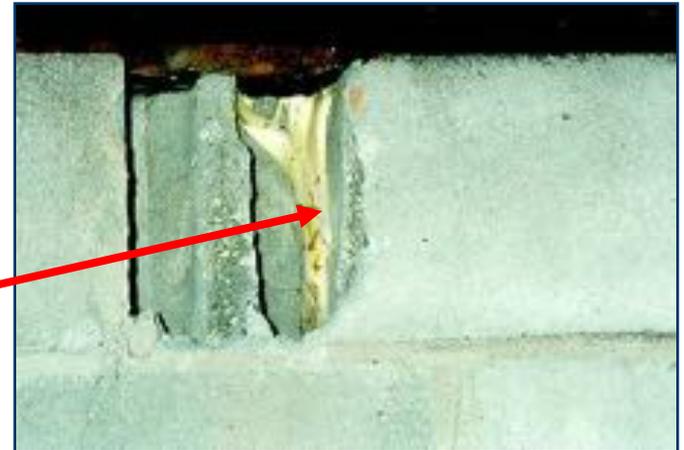


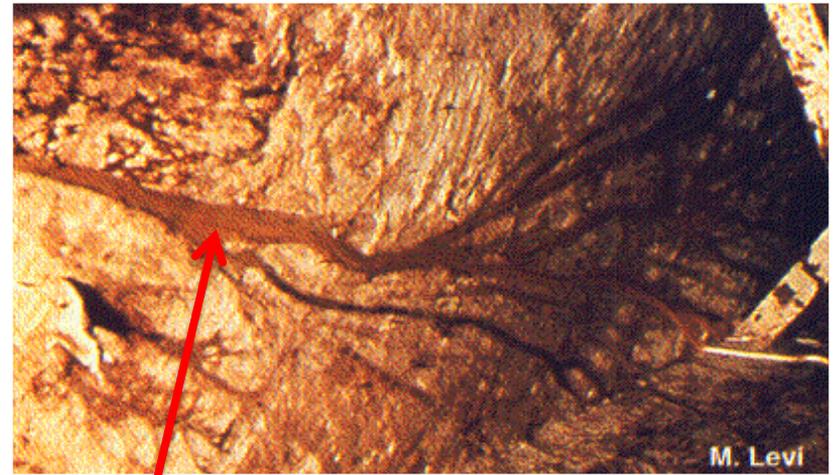
This is a cross section of wood with white rot
Showing the fungus has degraded some cells completely, but not others.

Water Conducting Fungi – attacks both softwoods & hardwoods

(Poria incrassata)

- Is a type of brown rot that does not need elevated wood moisture to attack structural wood
- Forms a taproot-like organ of mycelium called a **rhizomorph** to conduct water to sound wood
- A **rhizomorph** can be up to 25 feet long and up to 1" in diameter (normally ¼" to ½" in diameter)
- It gets moisture from a remote source (like a voided porch with no ventilation, a faucet leak outside, or a pipe leak inside the crawl)
- Damage to the wood occurs rapidly & appears like brown rot





Rhizomorphs

Mycelial fan sucking up moisture from soil



Poria incrassata

(water-conducting rot)



What are some problems associated with excess moisture in the crawl space caused by fungi?

Health related problems

For example, residents of homes with mold are at an elevated risk for both respiratory infections and bronchitis. When mold spores are inhaled by an immuno-compromised individual, some mold spores may begin to grow on living tissue, attaching to cells along the respiratory tract and causing further health problems.





- Condensate in walls allows molds and mildew to grow, some of which may cause health problems for certain individuals.
- Allergies, asthma and other conditions can be triggered or caused by certain molds and mildew for some people.

Damage to structural timbers from wood decay fungi

- Significant damage to structures occur each year from wood decay fungi. Homeowners see damage in structural lumber, log homes, eaves, garage doors, exterior door trim, window casings and other wood used in construction. However, sometimes homeowners don't see the wood decay occurring in structural wood of the crawl space.



Damage to structural timbers from wood decay fungi

- According to Ohio State University, replacement materials needed to repair damage caused by decay account for nearly 10% of U.S. annual wood production.
- Wood rot destroys about 20 billion board feet of timber each year – far more than the annual amount destroyed by fire damage.



Damage to the home and its contents

Mold and mildew may cause damage to contents of homes and may also cause health problems



Mold on clothes



mold on carpet, padding, & wood



mold on sheetrock & structural wood

Damage to the home and its contents

Wood and fiber based materials are subject to swelling when wet, whether by exposure to water vapor the in the air or from condensation surfaces.

- Structural wood (especially in the crawl space) and flooring
- Doors and windows, baseboards and other millwork
- Cabinets
- Furniture
- Picture frames
- Wooden art, books, paper items (\$\$\$)
- Pianos and other musical instruments (\$\$\$)

High moisture levels can also encourage corrosion of metal items.

Increased relative humidity inside crawl spaces causes the condensation of water, damaging window and allowing the development of molds & mildews inside the home.

- The high levels of humidity in crawl spaces can be a problem in both summer and winter. In homes built on crawl spaces, evaporation of moisture from the earth is a major source of humidity inside the home.
- When cold air meets warm air, water vapor condenses at the interface.



Increased relative humidity on the inside the structure causes the increase of energy costs to run the air-conditioner & dehumidifier

- Controlling humidity in your crawl space can help you save money on energy bills.
- In addition, it can make you feel more comfortable in your home.



Molds and mildews developing inside the crawl space of homes that have excess moisture in the crawl space cause bad odors inside of the home.



No one likes the smell of a “moldy” home!

Excessive moisture levels in the crawl space of homes facilitates conditions which favor many pests that may enter the home:

- American and Smoky brown cockroaches
- Cave or camel crickets
- House centipedes
- Slugs
- Psocids (book lice)
- Carpenter ants
- Old house borers
- Powder post beetles
- Subterranean termites



Foundation vents that are left open in the winter may result in moisture conditions in the crawl space which cause rusty pipes, rusty heating units, and frozen water pipes



Excessive moisture in the crawl space may ruin subfloor insulation

- the insulation may retain moisture and lose its insulation value
- the insulation may get so water-logged that it falls to the ground
- the insulation may develop mold and mildew all over it.



What are some causes of excess moisture in the crawl?

- **High environmental moisture.**
Georgia is located in an area of high moisture.
- **Moisture intrusion from the surrounding environment** (high humidity, rain, ice, moisture)
- **Crawl space moisture evaporating from the soil** and condensing on structural wood of the crawl space

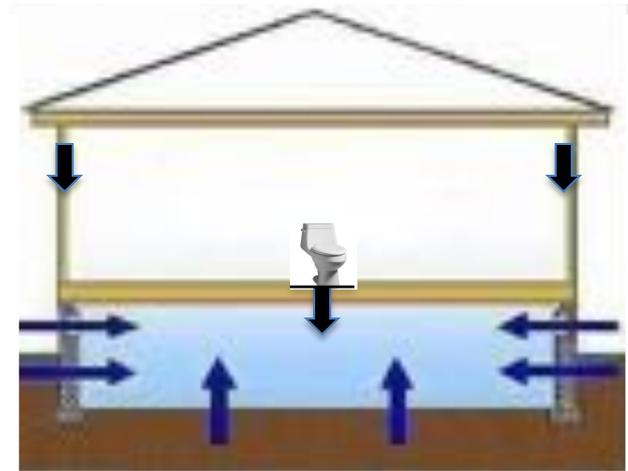
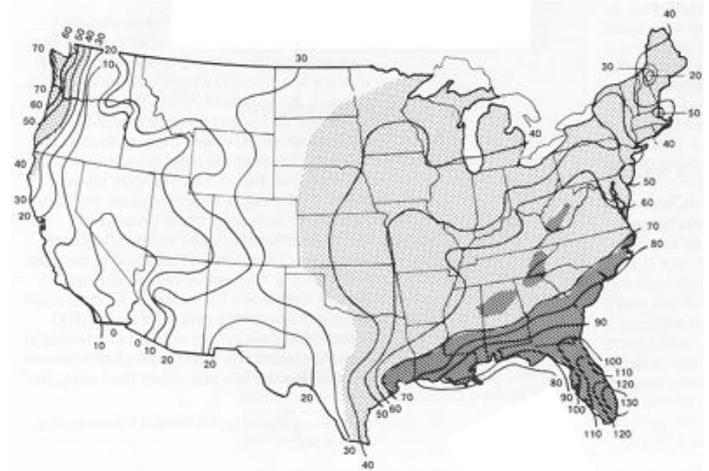


Figure 2. Entry points for moisture intrusion

What are some causes of excess moisture in the crawl space?

Plumbing leaks



What are some causes of excess moisture in the crawl space?

Landscape features:

A grade that is tilting down to the structure, overwatering shrubs and flower beds that are adjacent to the exterior foundation walls of the crawl space



What are some causes of excess moisture in the crawl space?

Uninsulated or poorly insulated heating or AC ducts



What are some causes of excess moisture in the crawl space?

Large heating/AC ducts block cross ventilation of the air in the crawl space



What are some causes of excess moisture in the crawl?

- lack of proper vents (size, number and placement) and/or a vapor barrier



What are some causes of excess moisture in the crawl space?

Lack of proper vents (size)



What are some causes of excess moisture in the crawl space?

Lack of proper ventilation (shrubby blocks air-flow)



What are homeowner concerns?

- Health related problems
- Damage to structural members of the home
- Damage to the home and its contents
- Development of molds inside the home
- Increased energy costs
- Bad odors inside the home
- Infestation of nuisance pests inside the home
- Infestation of wood destroying organisms in the crawl space
- Damage to pipes and freezing of pipes

**So, how do we prevent
wood decay in crawl space homes?**

**Keep the moisture level of wood
in crawl spaces below the FSP.**

Moisture meters used to detect moisture levels in wood

Delmhorst moisture meters



Tramex moisture meters



If the moisture meter has pins:

- Consult the temperature and type of wood charts to interpret the moisture meter readings.
- Always point the pins along the grain of the wood

Temperature Conversion Chart

Corrected Moisture Readings Based on Temperature for Delmhorst J Lite Moisture Meter													
Wood Temp. °F	Readings Shown on Delmhorst Moisture Meter												
	6	8	10	12	14	16	18	20	22	24	26	28	30
0	9	12	15	18.2	21.4	24.6	27.8	31	33.8	36.6	39.4	42.2	45
10	8.5	11.5	14.5	17.5	20.5	23.5	26.5	29.5	32.2	34.9	37.6	40.3	43
20	8	11	14	16.8	19.6	22.4	25.2	28	30.4	32.8	35.2	37.6	40
30	7.5	10.3	13	15.6	18.2	20.8	23.3	26	28.4	30.8	33.2	35.6	38
40	7	9.5	12	14.4	16.8	19.2	21.6	24	26.4	28.8	31.2	33.6	36
50	6.5	9	11.5	13.7	15.9	18.1	20.3	22.5	24.8	27.1	29.4	31.7	34
60	6	8.5	11	13	15	17	19	21	23.2	25.4	27.6	29.8	32
70	6	8	10	12	14	16	18	20	22	24	26	28	30
80	6	7.5	9	11	13	15	17	19	20.8	22.6	24.4	26.2	28
90	5.5	7	8.5	10.4	12.3	14.2	16.1	18	19.7	21.4	23.1	24.8	26.5
100	5	6.5	8	9.8	11.6	13.4	15.2	17	18.6	20.2	21.8	23.4	25

Excessive moisture that could enable wood decay spores to germinate and cause wood decay to structural timbers of the crawl space.

26 + 3 = 29

To be added to the moisture meter readings taken of Southern Yellow Pine													
0.5	1.5	2	2.5	2.5	3	3	3	3	4	4	4	4	4

■ = moisture level above the wood fiber saturation point

Temperature Conversion Chart

Corrected Moisture Readings Based on Temperature for Delmhorst J Lite Moisture Meter													
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10	8.5	11.5	14.5	17.5	20.5	23.5	26.5	29.5	32.2	34.9	37.6	40.3	43
20	8	11	14	16.8	19.6	22.4	25.2	28	30.4	32.8	35.2	37.6	40
30	7.5	10.3	13	15.6	18.2	20.8	23.4	26	28.4	30.8	33.2	35.6	38
40	7	9.5	12	14.4	16.8	19.2	21.6	24	26.4	28.8	31.2	33.6	36
50	6.5	9	11.5	13.7	15.9	18.1	20.3	22.5	24.8	27.1	29.4	31.7	34
60	6	8.5	11	13	15	17	19	21	23.2	25.4	27.6	29.8	32
70	5	8	10	12	14	16	18	20	22	24	26	28	30
80	6	7.5	9	11	13	15	17	19	20.8	22.6	24.4	26.2	28
90	5.5	7	8.5	10.4	12.3	14.2	16.1	18	19.7	21.4	23.1	24.8	26.5
100	5	6.5	8	9.8	11.6	13.4	15.2	17	18.6	20.2	21.8	23.4	25

Excessive moisture that needs to be controlled, but not yet active wood decay in the structural wood of a crawl space.

20 + 3 =
23

To be added to the moisture meter readings taken of Southern Yellow Pine													
0.5	1.5	2	2.5	2.5	3	3	3	3	4	4	4	4	4

= moisture level above the wood fiber saturation point

So, what kind of services do most PCOs use to control or prevent wood decay fungi in crawl space structures?

- Inspect to determine the moisture source
- Isolate wood-to-earth contacts
- Provide adequate ventilation
- Install vapor barriers
- Chemical treatment of wood (BORACARE)
- A growing # of PCOs provide encapsulation of the crawl

**And...what are the minimum standards
required to control or prevent wood
decay fungi in structures?**

So, what are the minimum standards for the control or the prevention of Wood Destroying Fungi?

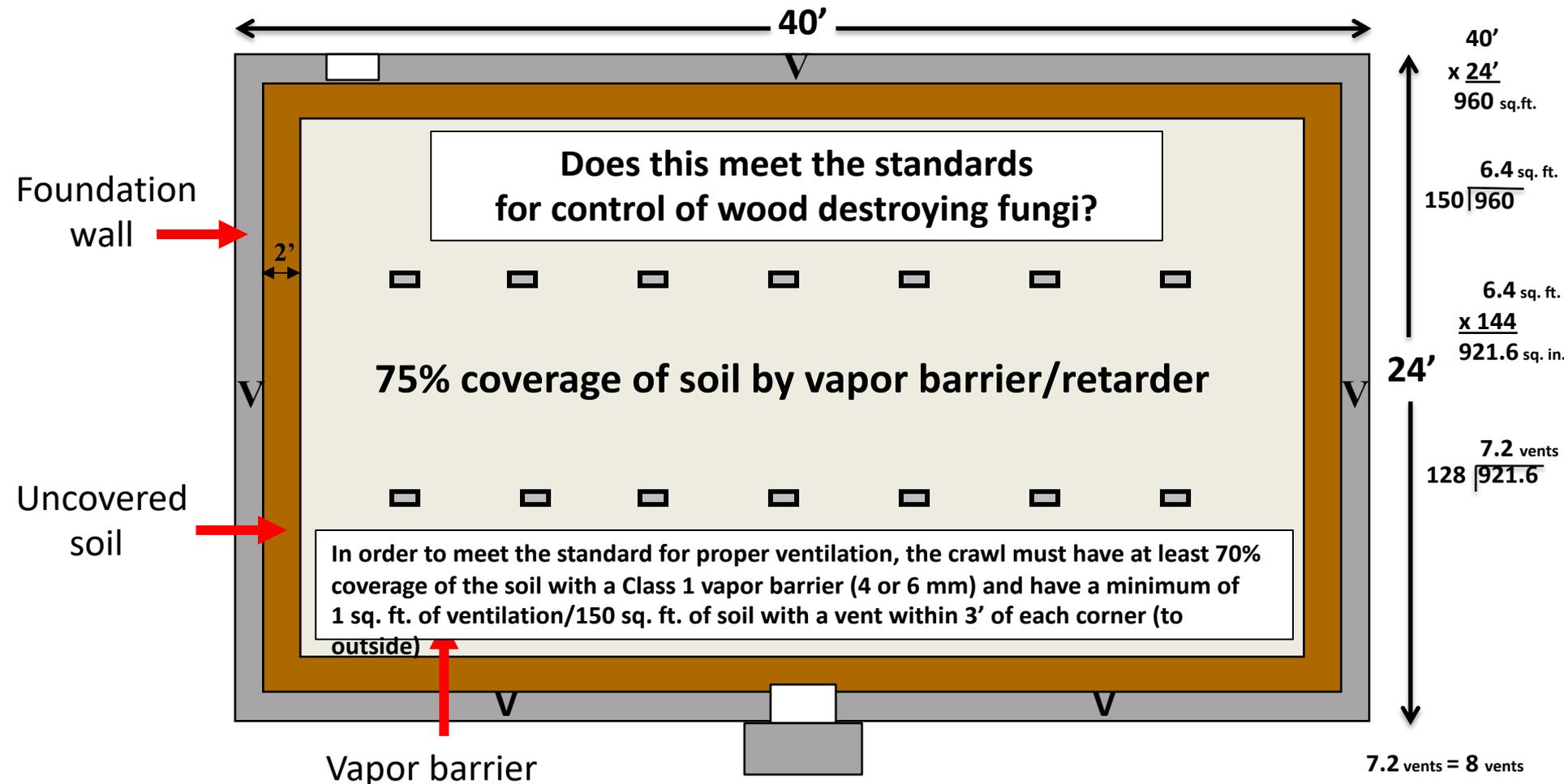
- (4) Minimum adequate treatment for control or prevention of wood destroying fungi shall include the following:
 - (a) When infestation is located in a crawl space, treatment shall include the Installation of a polyethylene or other water impervious vapor barrier to at least seventy (70) percent of the exposed soil surface in the enclosed space and insure that ventilation of the under-floor space between the bottom of the floor joists and earth meets the current requirements of the International Residential Building Code, the latest edition as adopted and amended by the GA Dept. of Community Affairs.

A vapor barrier traps moisture underneath it

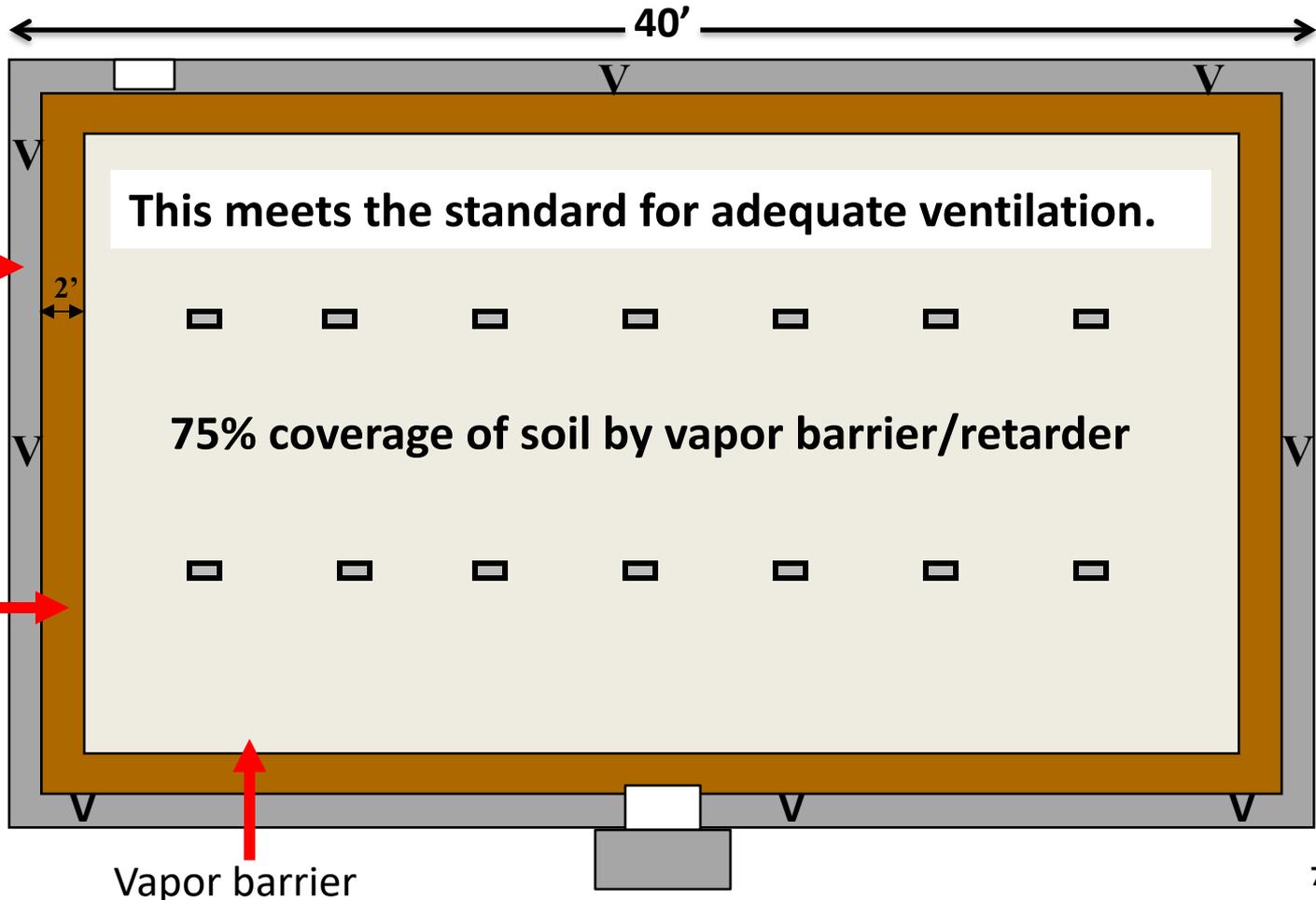


Installation of a polyethylene or other water impervious vapor barrier to a minimum of seventy (70) percent of the exposed soil surface in the enclosed space...

and insure that ventilation of the under-floor space between the bottom of the floor joists and earth meets the current requirements of the International Residential Building Code, the latest edition as adopted and amended by the GA Dept. of Community Affairs.



In order to meet the standard for proper ventilation, the crawl must have at least 70% coverage of the soil with a Class 1 vapor barrier (4 or 6 mm) and have a minimum of 1 sq. ft. of ventilation/150 sq. ft. of soil with a vent within 3' of each corner (to outside)



This meets the standard for adequate ventilation.

75% coverage of soil by vapor barrier/retarder

$$40' \times 24' = 960 \text{ sq. ft.}$$

$$\frac{6.4 \text{ sq. ft.}}{150} \times 960$$

$$\frac{6.4 \text{ sq. ft.}}{150} \times 144 = 921.6 \text{ sq. in.}$$

24'

$$\frac{921.6}{128} = 7.2 \text{ vents}$$

7.2 vents = 8 vents

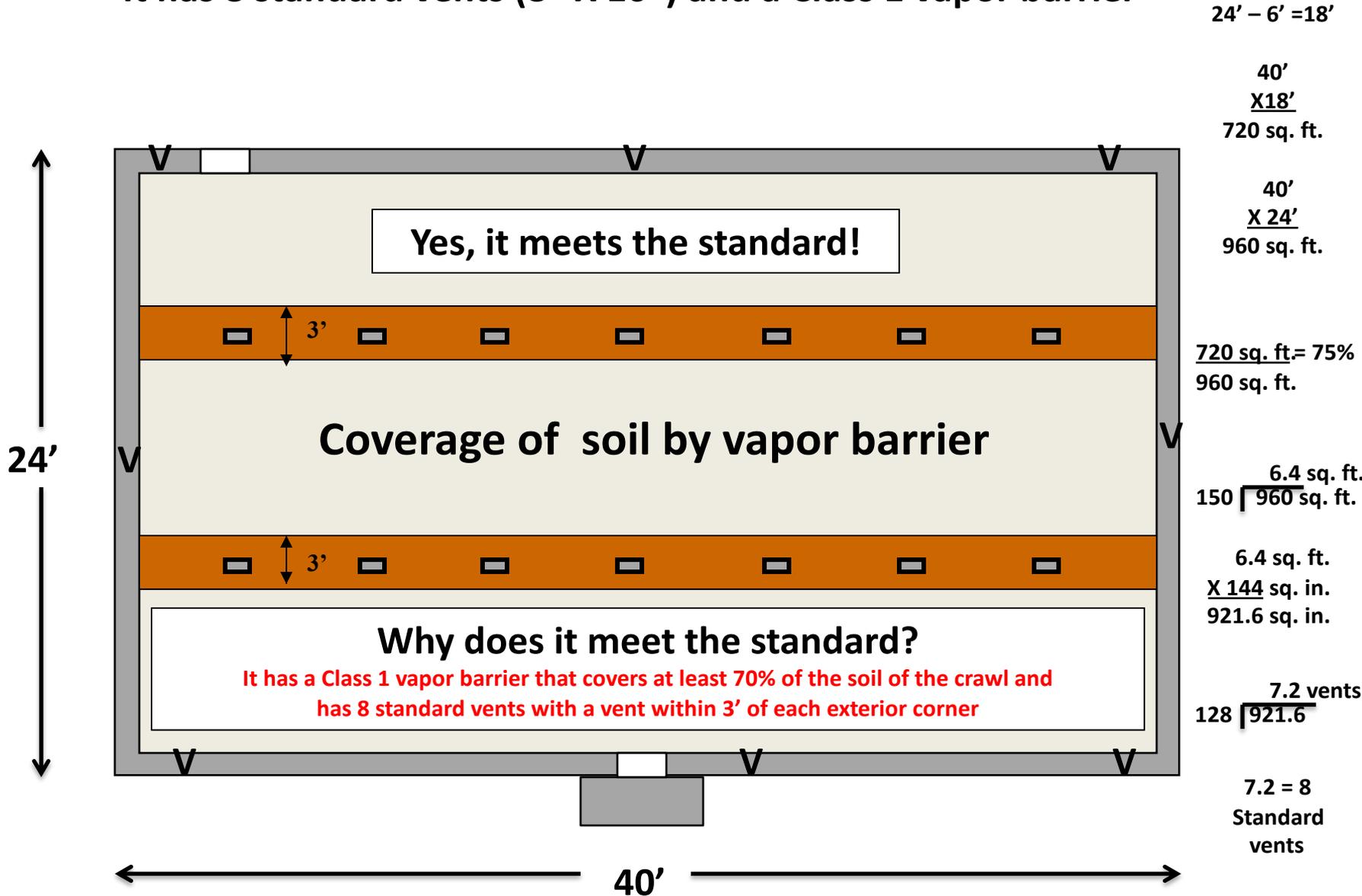
Foundation wall

Uncovered soil

Vapor barrier

Does this crawl space meet the ventilation requirements?

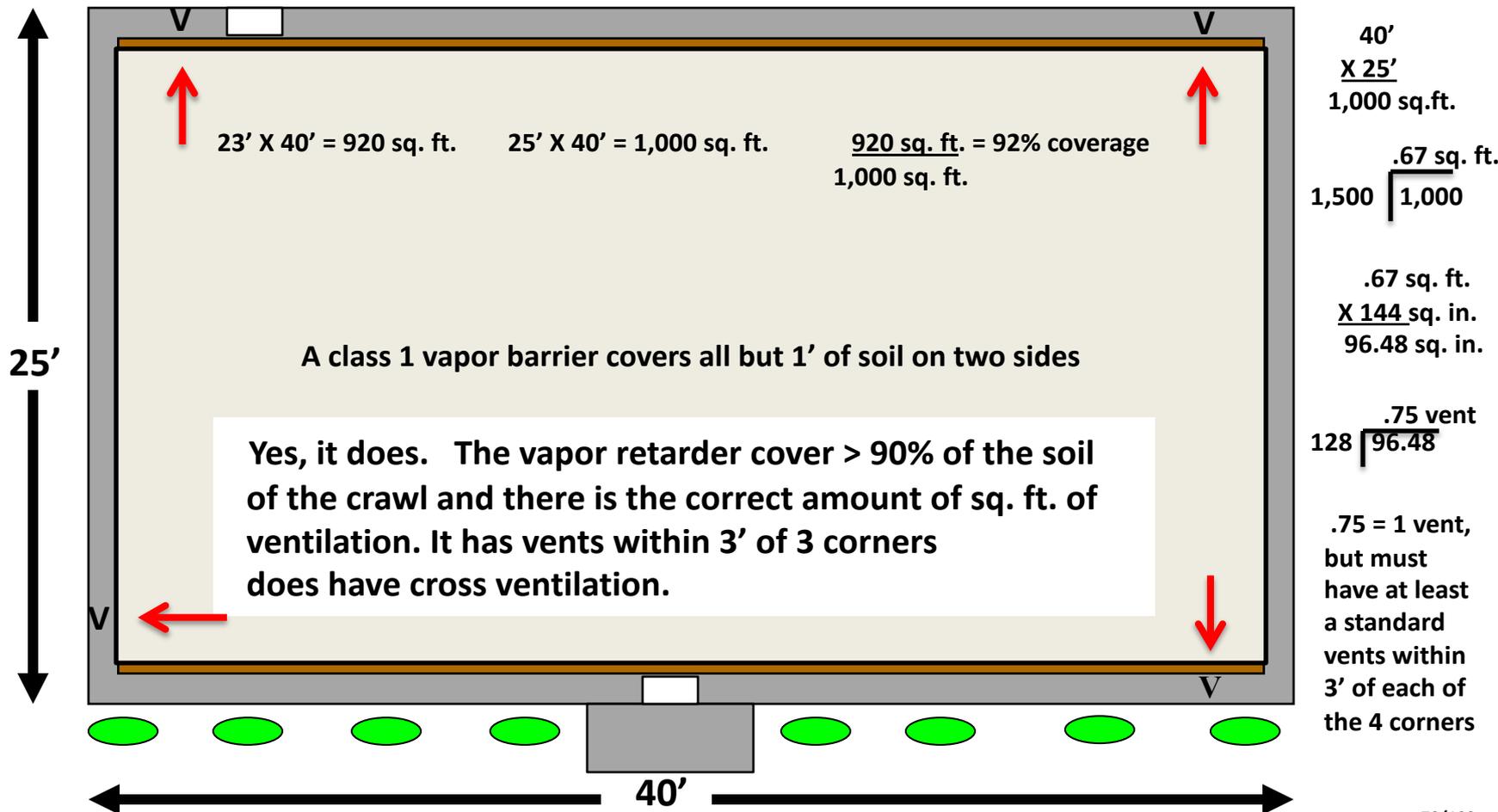
It has 8 standard vents (8" X 16") and a Class 1 vapor barrier



Remember – the crawl must meet the ventilation requirements!

It has 4 standard vents (8" X 16")

Does the crawl space soil have 90% coverage with a 4 or 6 mm vapor barrier with at least 1 sq. ft. of ventilation per 1,500 sq. ft. of soil in the crawl space, with the vents placed within 3 feet of each corner or have cross ventilation?

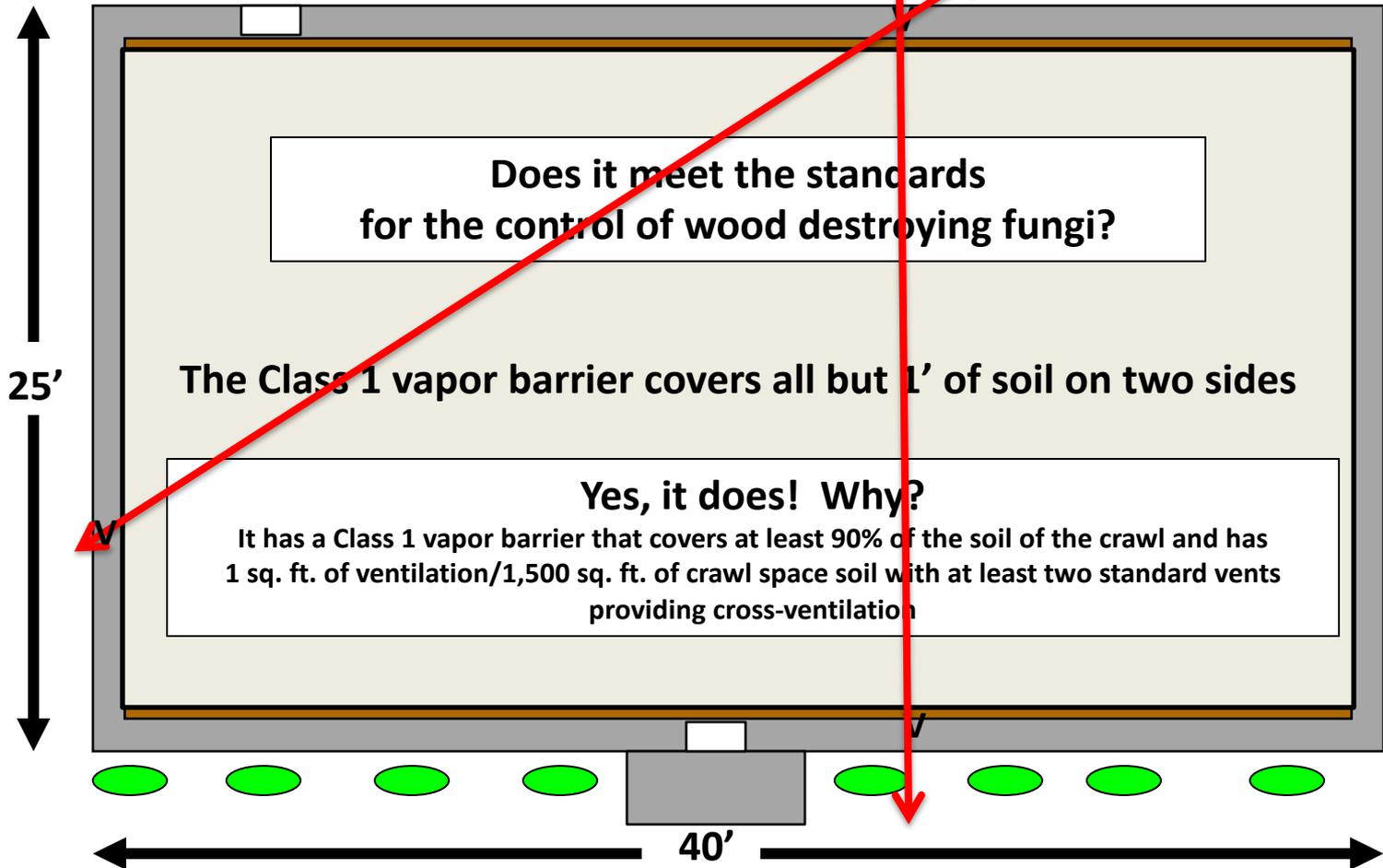


This crawl space has 3 standard vents (8" X 16") and the Class 1 vapor barrier covers all the soil except 1' on two sides

23' X 40' = 920 sq. ft.

25' X 40' = 1,000 sq. ft.

920 sq. ft. = 92% coverage
1,000 sq. ft.



Does it meet the standards for the control of wood destroying fungi?

The Class 1 vapor barrier covers all but 1' of soil on two sides

Yes, it does! Why?
It has a Class 1 vapor barrier that covers at least 90% of the soil of the crawl and has 1 sq. ft. of ventilation/1,500 sq. ft. of crawl space soil with at least two standard vents providing cross-ventilation

40'
X 25'
1,000 sq. ft.

.67 sq. ft.
1,500 | 1,000

.67 sq. ft.
X 144 sq. in.
96.48 sq. in.

.75 vent
128 | 96.48

.75 = 1 vent, but must have at least 2 standard vents with cross ventilation

Minimum adequate treatment for the control or prevention of wood destroying fungi in crawlspace structures

(b) In addition to the above requirements, when an infestation of **water conducting fungi** is located in a crawlspace, control measures shall include the following:

1. Cut the visible rhizomorphs and scrape visible fungal growth from the foundation walls.
2. Removal of all wooden contacts between buildings and inside crawlspace soil, other than those wooden supports which have been treated with preservatives to a minimum preservative retention designed for ground contact.



Wood touching soil – Not OK



Wood not touching soil - OK

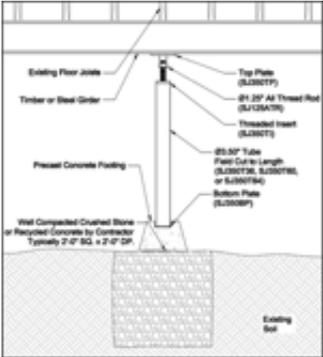


All these wooden supports need to be removed and replaced with house jacks



Removing wood-to-earth contacts (unless pressure-treated for ground contact) or properly insulate them from contact with the soil

Most often, we replace wooden piers or posts with properly installed house jacks (supports)



Chemical treatments to the wood are not required, but may help control wood decay fungi/surface molds & mildews

- BORA-CARE, Borathor, BoRam, and other borate products are used most often by PMP
- Borates are highly toxic to plant life
- Applied with spray equipment or brush
- Following label directions is critical to success
(read and follow the label)
- The source of moisture must be addressed to ensure long-term control of wood decay fungi and surface fungi

To dye or not to dye...that is the question

Wood treatment for control of wood decay fungi

- You are not required to add a dye or a marker to a borate treatment when you treat wood for the control of **wood decay fungi**...but adding dye to the borate solution makes it easier to insure that all the wood is treated.

Wood treatment for control of subterranean termites

- If you use a borate treatment for the control of **subterranean termites** in wood, you will need to add a dye or a marker to the borate solution.



Preventing excess moisture in crawl spaces is a complicated issue in the South

There will be times when adequate ventilation and a vapor barrier will not prevent wood decay or any of the other problems that are often associated with excess moisture in the crawl space.

Other services

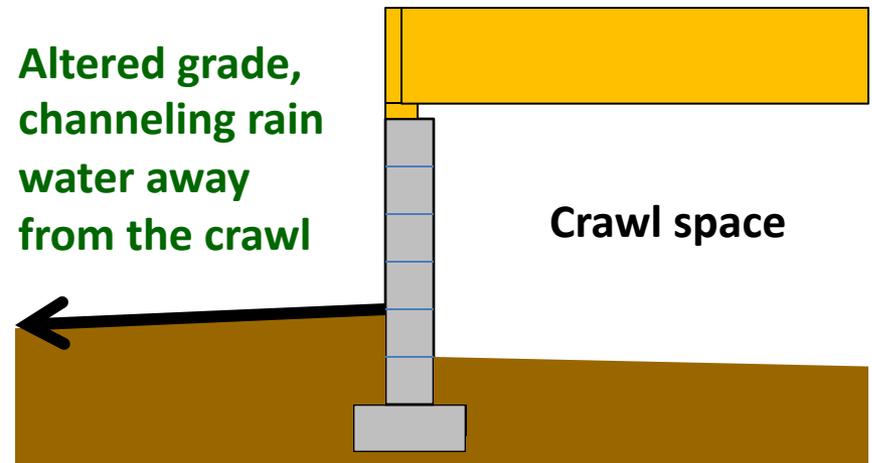
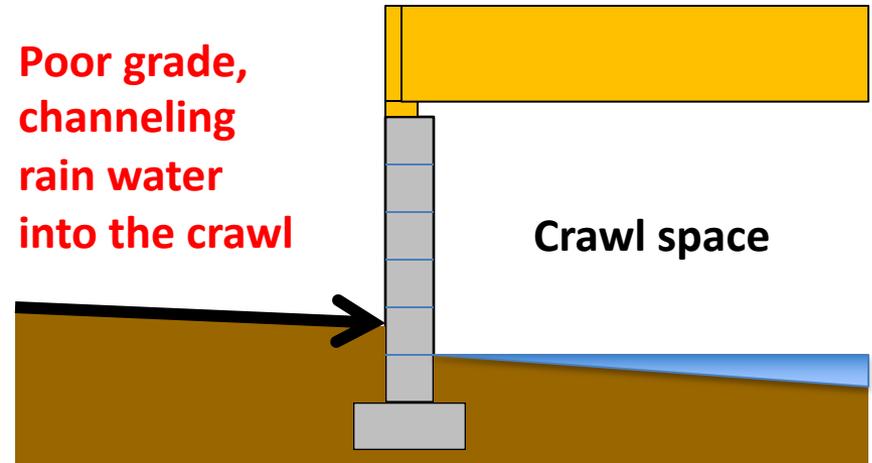
some PCOs use to prevent or control excess moisture in crawl space wood:

- Fix plumbing leaks and roof leaks
- Altering the grade to improve poor drainage
- Foundation water-proofing and adding french drains or other drainage systems to improve poor drainage
- Venting dryer vent to outside (not crawl space)
- Insulation of H/AC ducts
- Adding gutters
- Installing sump pumps
- Encapsulation

Repairing plumbing and roof leaks



Altering the grade is necessary when the grade is responsible for accumulating H₂O in the crawl



Installing a Foundation Waterproofing and a French Drainage System

Foundation waterproofing is necessary to prevent soil moisture from entering the structure through the foundation wall and a French drainage system is installed adjacent to the bottom of the foundation wall at the footer and covered with a bed of crushed rock (gravel) to permit water to drain into the drainage system and away from the structure.



Efflorescence in a “dug-out” crawl space

Efflorescence is a crystalline deposit on surfaces of masonry, stucco or concrete. It looks like white powder. It is an indication of a moisture problem in the crawl space.



This crawl space probably needs foundation water proofing and a French drainage system

A dryer vent is disconnected and is dumping moisture into the crawl space



It needs to be corrected!



Insulation of heating/AC ducts

- When the temperature of the crawl space air is significantly different from the temperature on the outer surface of the ducts or the insulation of poorly insulated ducts, “sweating” or condensation occurs... often contributing to decay of structural wood near the ducts and the accumulation of excess moisture in the crawl space.



Installing insulation to replace poorly insulated ducts that “sweat”, causing excess moisture in the crawl space

Installing gutter systems



Roof runoff and improper grading allow water to collect where it can enter the crawl space through cracks in the foundation walls. Functioning gutters and a finished grade that slopes away from the house ensures bulk moisture is kept out of the crawl space.

Installing a sump pump in a crawlspace



Encapsulation...

The most expensive, but best option for controlling and/or preventing wood decay fungi



Before



After

If you choose to enter into a contract for control of wood decay fungi in GA...

- If you sell a contract for control of wood destroying fungi, your treatment must meet the minimum standards for control of wood destroying fungi.
- However, if you sell the contract for control of excess moisture of the crawl space or just sell an Encapsulation contract and do not refer to control of wood destroying fungi, that work is not under the jurisdiction of the Department of Agriculture which regulates the pest control industry.



***Confucious knew
a lot about wood
decay fungi***



Confucious say:

***“When too much
water gets in the
crawl, there’s a
fungus among us”***



Confucious say:

“Wet wood

is

no good!”