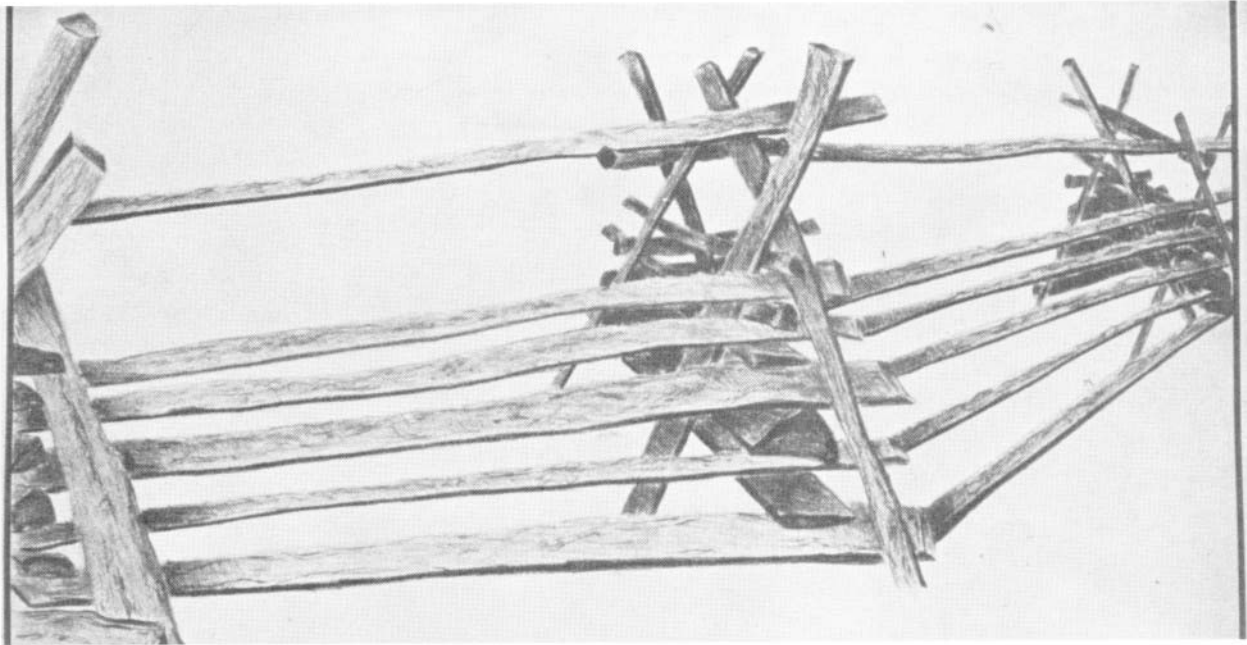




# PROTECTING WOOD FENCES FOR YARD AND GARDEN

Rodney C. De Groot, William C. Feist, Wallace E. Eslyn, Lee R. Gjovik



**Centuries-old fences still stand in eastern United States, but the native chestnut trees from which the rails were split are now gone. Different woods are used in today's fences and these can also provide years of pleasure and service, if given a little extra care.**

**Whether you choose a wood fence for beauty, or for privacy, the natural warmth of wood is yours to enjoy if you protect it. To enjoy a lasting fence, build it with proper wood materials, learn how to protect it against decay, and plan a regular maintenance program.**

#### **WOOD FENCES HAVE NATURAL ENEMIES**

**The critical link in your fence is the post—and the principal cause of post failure is decay or rot. Fungi cause wood decay. When conditions favor their growth, microscopic filaments of decay fungi grow through wood, break it down, and use it for food.**

**Decay fungi need moisture and oxygen to grow. Decay is most severe at the groundline where moisture from the soil mixes with oxygen from the air.**

**Decay fungi reproduce by producing microscopic spores. These spores blow around like dust in the wind, so wood posts are easily exposed to decay fungi.**

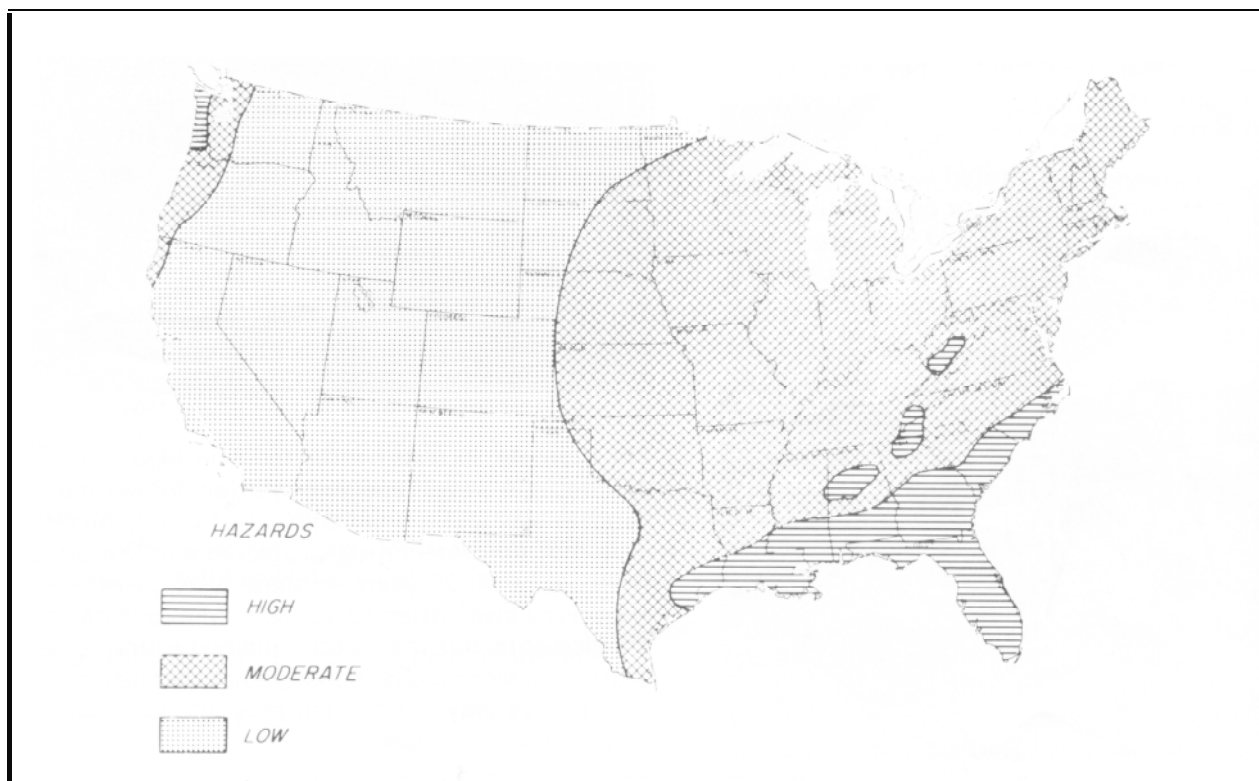
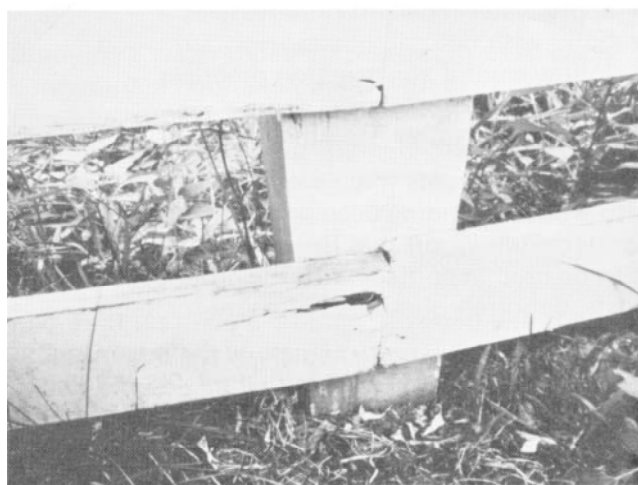
The decay in above ground parts of fences is greatest in the South Atlantic states, Gulf Coast states, along the Pacific coast of Washington and northern Oregon, and in Hawaii.

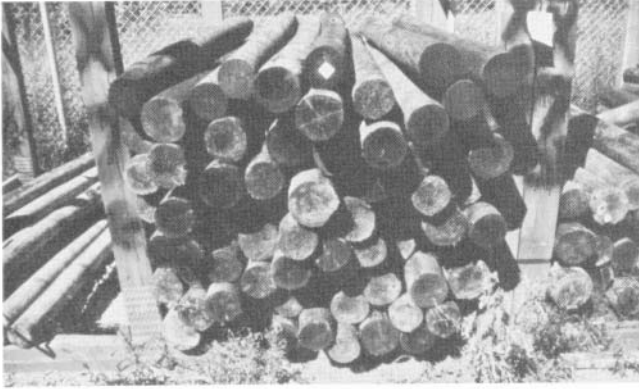
Termites are another natural enemy of fences, The danger of underground termit attack is greatest in the Gulf Coast, South Atlantic, and in Hawaii. Underground termite colonies in dead roots, buried debris, or stumps usually are the sources for beginning attacks on wood fences.

Rot isn't as severe on fence parts above ground, but wood can easily decay where too much water is trapped and absorbed.

- Soil in contact with fence boards supplies moisture for decay
- Water that enters surface cracks of horizontal rails may keep internal wood wet enough to decay it
- Water, trapped between a horizontal rail and board, can lead to decay
- Water, seeping between joints of rails, located directly over a post, will wet ends of rails and top of post—both may decay
- Water is absorbed through ends of wood pieces faster than through their sides, so the ends of rails, braces and boards usually decay faster

Wet climates favor decay. The "service life" of posts is an estimate of the years posts will support a fence. For example, aspen or poplar posts lack natural decay resistance, so they will last only 1.4 years in semitropical Mississippi. Yet they last 14 years in the dry climate of Arizona.





## PROTECT YOUR FENCE

- To protect wood fences from decay, you can:
- use wood pressure-treated with preservatives
  - apply water-repellent preservatives
  - build with naturally decay-resistant wood
  - follow careful construction practices

### Pressure Preservative Treatments

Pressure treatments force preservative chemicals into wood, providing deep protection against decay and termites. Wood that lacks natural durability and is to be used in contact with the ground, such as posts, definitely should be pressure-treated.

The color of the wood can't show the quality of treatment. Wood treated with oil-based preservatives, such as pentachlorophenol, is usually light-to-dark brown. Most of the waterborne-salts treatments leave a greenish color because they contain copper or chromium salts. Sometimes lumber receives a brightly colored coating that prevents fungus stain during shipment. These coatings are not pressure treatments. They are only surface treatments and give no long-term protection against decay or termites.

When buying preservative-treated wood, pay close attention to the stamps, labels or certifications on them. Treated materials to be used in contact with the ground should be stamped, labeled or otherwise certified as having received a treatment for ground use.



Treated wood marked "for above ground use only" should not be used in the ground. Use these materials only above ground — they contain less preservative than do posts treated for ground contact.

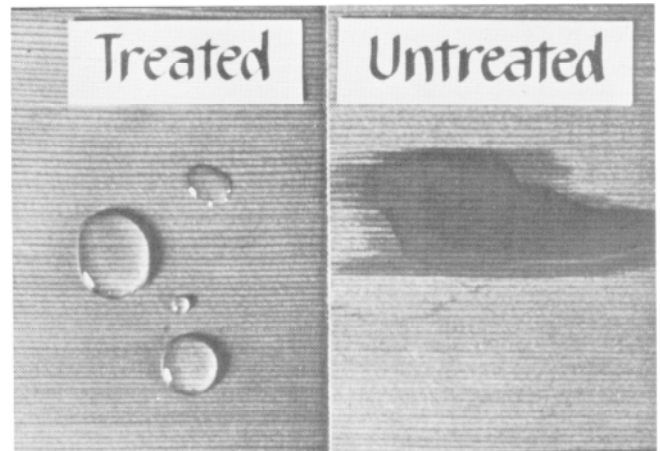
### Water-Repellent Preservatives

Wood that isn't pressure-treated and is used above ground, can benefit from a water-repellent treatment that penetrates the end grain but only coats the surface. These treatments help wood shed water rather than absorb it. They help prevent decay started by rain seeping between or through the ends of wood pieces.

Apply water-repellent preservatives only after wood pieces have been cut to size. These treatments work because they seal the wood surface. Any saw-cut after-treatment will expose unprotected wood. During construction, give precut wood pieces a 3-minute soak in a water-repellent preservative before assembly. Or, brush ends and sides of all wood pieces and joints in the fence with a water-repellent preservative. Let treated wood dry for several days before painting or staining.

Remember, water-repellent treatments are only effective for wood used above ground.

Water-repellent solutions that don't contain a fungicide are also useful in areas where decay hazard isn't too great.



For example, in tests conducted near Madison, Wisconsin, a water-repellent solution containing paraffin wax and a small amount of drying oil or resin, but no preservative, protected window units from decay for 20 years. In these tests, paint weathered away after 10-12 years of exposure to the elements, but the wood remained sound. One caution: water-repellent treatments that lack a preservative may not prevent mold growth, especially in warm climates.

# WOOD PRESERVATIVE

**CLEAR • PAINTABLE • WATER REPELLEN**  
**Protects Against Rot, Termites, Warping**

EPA REG. NO. 1409-14

**DANGER!** KEEP OUT OF REACH OF CHILDREN  
HARMFUL OR FATAL IF SWALLOWED OR ABSORBED  
THROUGH SKIN.

Read Cautions Elsewhere On Label Carefully

Here are the materials and directions for making a wax-base water-repellent solution.

Materials	For 1 Qt.	For 1 Liter	For 1 Gal.
boiled linseed oil	1/2 cup	113 ml.	1-1/2 cups
paraffin wax	1/4 oz.	7 gm.	1 oz.
solvent (turpentine, mineral spirits, or paint thinner)	1-1/2 pts.	709 ml.	3 qts.

Mix the boiled linseed oil with the solvent. Then, cut the wax into thin shavings and add it to the mixture. After adding wax, set the container in the sun where it will reach a temperature of 75°F (24°C) or more. As the solution warms, the wax will dissolve. Do not melt wax over an open flame as paraffin may ignite. After the wax has dissolved, apply the mixture to wood. Let treated wood dry for several days before painting or staining.

### Be Careful with Preservatives

Remember that wood preservatives contain fungicides, and fungicides are pesticides. If used improperly, pesticides can harm people, animals and plants. Follow the directions and precautions on labels. Store pesticides in original containers – out of reach of children and pets.

All pesticides are reviewed by the Environmental Protection Agency and the Department of Agriculture. Use only pesticides which bear a federal registration number and carry directions for home and garden use.

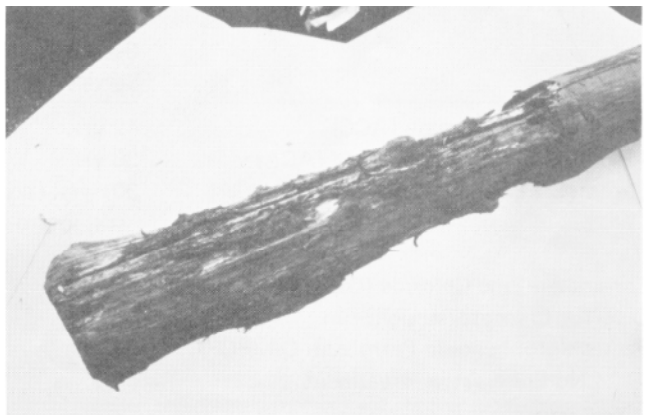
Vapor from wood treated with pentachlorophenol may poison plants and "burn" leaves which contact treated wood. Waterborne - salts treatments leave a dry, paintable surface and don't harm leaves. Naturally decay-resistant woods are compatible with plants.

Spraying a water-repellent preservative can easily contaminate non-target areas with drift. Brushing on water-repellent preservatives improves penetration and lessens environmental hazard.

### Naturally Durable Woods

In certain trees, the core of the trunk, called heartwood, contains chemicals that resist decay fungi and termites. Below ground, sapwood will rot, but durable heartwood will remain.

When buying posts of naturally durable wood, examine the ends and then select posts with mostly heartwood. Posts, split or sawed from larger trees, should be mostly heartwood. Posts from slowly grown trees will have a greater proportion of heartwood.



How long naturally decay-resistant wood lasts depends on the type of wood and the climate. Untreated, square, California redwood posts should last 4 to 20 years, depending on climate.

Natural, split western redcedar posts should last 8 to 24 years. Round, northern white cedar posts should last 13 to 27 years with no treatment.

## Heartwood Decay-Resistance of Some Common Native Trees

<u>Resistant or Very Resistant</u>	<u>Moderately Resistant</u>
Catalpa	Baldcypress*
Cedars	Douglas-fir
Cherry, black	Honey locust
Chestnut	Larch, western
Cypress, Arizona	Oak, swamp chestnut
Junipers	
Locust, black	Pine, eastern white
Mulberry, red	Pine, longleaf
Oak, bur	Pine, slash
Oak, chestnut	Tamarack
Oak, Gambe	
Oak, Oregon white	
Oak, post	
Oak, white	
Osage-orange	
Red wood	
Sassafras	
Walnut, black	
Yew, Pacific	

\*Heartwood of old growth baldcypress trees is very resistant to decay, but heartwood from second growth trees is not. Therefore for use in the ground, baldcypress needs preservative treatment.

Untreated pine posts last about 3 years in the South, 3 to 6 years in the Midwest and Northeast, and 6 to 12 years in the dry regions of the West.

How long do pressure-treated posts last? Pine posts pressure treated for ground contact should last 30 to 40 years, anywhere in the United States. Results reported below are from Forest Products Laboratory field tests in southern Mississippi with posts pressure-treated for ground contact use.

<u>Preservative</u>	<u>Estimated Service Life</u>
Acid Copper Chromate (ACC)	42 yrs.
Ammoniacal Copper Arsenate (ACA)	38 yrs.
Chromated Copper Arsenate (CCA)	30+ yrs. (test still in progress)
Chromated Zinc Chloride (CZC)	38 yrs.
Coal-Tar Creosote, straight run	38 yrs.
Pentachlorophenol in Petroleum Oil (PCP)	33 yrs.
No Preservative Treatment	3.3 yrs.

### Above Ground Fence Parts

In dry areas where danger of decay is low, even moderately resistant wood, such as heartwood from Douglas-fir and ponderosa pine, will last almost as long as western redcedar or California redwood in the above ground parts of the fence.

In areas where moderate decay is likely, horizontal rails should be either preservative-treated or of naturally decay-resistant wood. Other fence parts will need surface treatments with water-repellent preservatives or solutions.

In areas where decay risk is great, all wood above ground should be either naturally decay-resistant or pressure-treated.

### Arbors and Trellises

Most of the recommendations for fences apply to arbors and trellises. However, if you treat the trellis with a water-repellent preservative at construction time, don't use solutions that contain pentachlorophenol. To protect posts, either use naturally decay-resistant wood or pressure-treated wood with a waterborne-salts preservative.

Where termites are likely, treat the soil around the base of the trellis. Always keep vines separated from wood trim, window frames, eaves and roof. Termites can use old or dead vines as pathways to upper parts of buildings.

### Protect from Termites

Take the first step to prevent termite attack as you build the fence and grade your yard. Remove old roots, boards or other wood residue from soil near the fence. Wood residue could supply a pair of termites with enough food to establish a new colony in your yard.

Where termite infestations are severe, have a pest-control specialist treat the soil around posts and below the fence with a pesticide. Where termites are likely, keep a clearance between house and fence to prevent termites from access to the house.

## MAINTAINING YOUR FENCE

### Natural, Weathered Wood

Unfinished wood, allowed to weather naturally, will develop a grayish color. At construction time, use a nonpigmented water-repellent preservative. Apply it with a brush, roller, sponge, or with spray equipment. Brushing gives greatly improved penetration and treatment.



## Semi-Transparent Stain or "Natural Finish"

**Semi-transparent stains soak into the wood without forming a film, so they will not crack or peel. These stains show the wood grain.**

## Paint

**When painting a new fence, brush the surface, all ends and joints, liberally with a water-repellent preservative and let it dry for several days before painting.**

**Use one coat of a good quality oil base primer, followed by two top coats of a good quality acrylic latex exterior house paint. Varnish finishes are not recommended for exterior fences because they can't stand up to sun and rain.**

## Repainting

**Scrape loose paint from wood, then use a stiff wire brush for remaining loose paint and dirt. Then brush on a water-repellent preservative, or, as second choice, a water-repellent solution—apply it liberally to ends of boards or pickets and to all joints. Let dry several days, then paint.**

## OTHER FENCE BUILDING TIPS

- **Wrapping asphaltic paper around a post probably won't protect it from decay or termites.**
- **Setting posts in crushed rock can improve drainage of water away from the post in light soils. But it can trap a pool of water around the base of the post in clay soils. Termites can go through the rock fill to get to the posts.**
- **Where posts need to be set in concrete for added stability, keep the anchorage at least 6 inches below ground line. A jacket of concrete that comes to the surface traps and holds water next to the post, promoting decay.**
- **Remember that iron nails rust rapidly and produce a severe brown or black discoloration around the nails. Use corrosion-resistant nails, such as aluminum or stainless steel.**

## SUMMARY

**For maximum protection against wood decay and termites, use posts that have an in-depth preservative treatment, preferably a pressure treatment for below ground use.**

**When selecting posts of naturally decay-resistant woods, choose posts with mostly heartwood.**

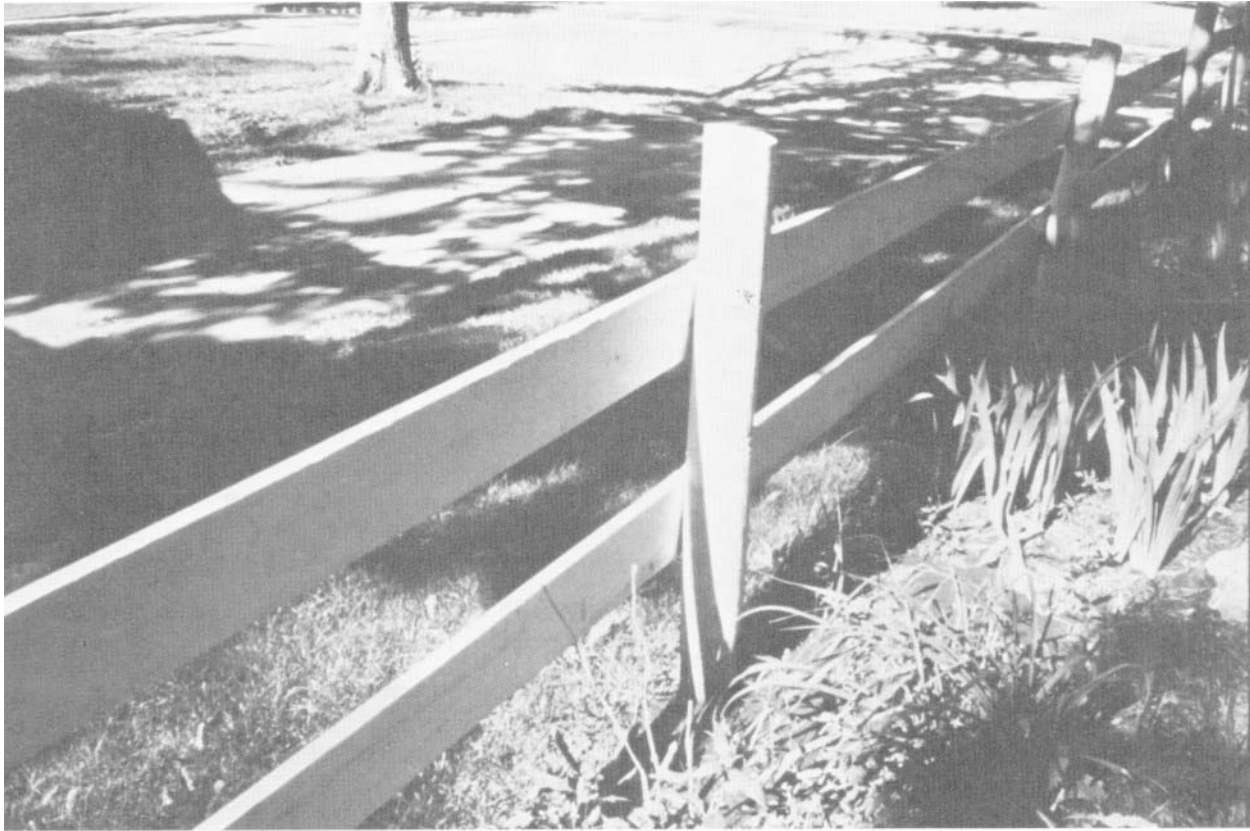
**Horizontal rails require more protection from decay than do vertical boards. In regions of high and moderate decay hazard, build rails with naturally decay-resistant wood or with pressure-treated wood .**

**Boards, pickets and other face parts should be of decay-resistant wood (either natural or treated) in areas where high decay is likely. Elsewhere, use materials of your choice and, where permissible, treat all joints with a water-repellent preservative.**

**Use aluminum or stainless steel nails when a water-repellent or stain finish will be used.**

**If a finish is desired, select one which contains both a water repellent and a wood preservative. Penetrating, pigmented stains are preferred over paints.**

**Keep boards off the ground. Where underground termites are a hazard, don't bury wood around your house or fence, and be sure to consult a professional pest-control specialist if you need a soil treatment.**



*Rodney C. DeGroot, William C. Feist, Wallace E. Eslyn and Lee R. Gjovik are wood technologists with the USDA Forest Products Laboratory. Manuscript reviewed by Glenn D. Barquest, professor of agricultural engineering, College of Agricultural and Life Sciences, University of Wisconsin-Madison and University of Wisconsin-Extension. Refer questions to Barquest.*



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