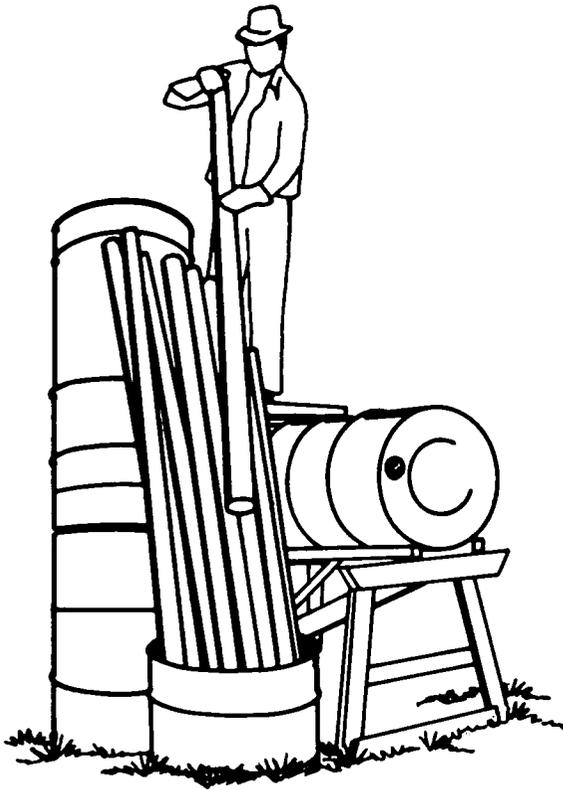


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Selecting and Preserving Fence Posts

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Wood and steel are the most common fence post materials. Both are generally available at farm supply stores in the Northwest. Retail prices vary between stores, affected by post material, quality, size, availability, and transportation cost.

Steel posts are very durable, lightweight, can be hand-driven into most soils, and withstand field fires well. They ground the fence against lightning if in contact with moist soil. Steel posts work well for temporary fences that must be moved.

Wood posts in the Pacific Northwest are likely to be round Douglas-fir, or perhaps lodgepole pine, treated with a wood preservative for long service. The once familiar untreated, split-cedar posts now are less readily available in quantity. Wood posts are produced locally and are comparatively low in price. They are stiff enough to better withstand crowding of stock against the fence. Usually they are set with powered equipment, either driven or

set into postholes. Properly treated they are durable. Pressure-treated wooden posts should have an average service life of about 30 years. Usually they are treated according to quality-control specifications developed by the American Wood-Preservers' Association. If you make a large purchase of pressure-treated posts and wish to have them inspected for conformance to treatment specifications, you can find that service listed under "Inspection Bureaus" in the yellow pages of telephone directories in major cities.

Less costly preservative-soaked posts may not be as uniformly treated or as durable as pressure-treated posts, but a good soaking treatment should provide for an average post life of 20 years or longer. Costs of preservative-soaked posts may be reduced further if you treat them yourself. Savings of cash outlay are greatest if you can cut posts from your own woodlot thinnings and contribute your own labor (Table 1).

Extension Circular 887

April 1976



Extension Service, Oregon State University, Corvallis, Joseph R. Cox, director. This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U. S. Department of Agriculture, and Oregon counties.

Table 1. Comparative Costs of Posts and Preservative Treatments with 5% Penta Solution.

| | Cost per post |
|---|------------------|
| <i>Steel posts (6 ft)</i> | |
| Lightweight | \$1.65 to \$2.25 |
| Heavyweight | 1.98 to 2.79 |
| <i>Wood posts, purchased pretreated¹</i> | |
| Pressure treated with penta | |
| Douglas-fir, 3-inch top | 1.50 to 1.97 |
| 4-inch top | 2.10 to 2.63 |
| Cold soaked in penta | |
| Douglas-fir, 3-inch top | 1.05 to 1.52 |
| 4-inch top | 1.40 to 2.02 |
| Lodgepole pine, 3-inch top | 1.20 |
| 4-inch top | 1.75 |
| <i>Wood posts, purchased untreated¹</i> | |
| Split cedar (often used untreated) | 1.19 to 1.65 |
| Douglas-fir, peeled, 3-inch top | 0.60 to 1.05 |
| 4-inch top | 0.80 to 1.40 |
| Lodgepole pine, peeled, 3-inch top | 0.85 |
| 4-inch top | 1.15 |
| <i>Your own wood posts²</i> | |
| Cost of commercial peeling | 0.14 to 0.35 |
| Cost of commercial pressure treatment | |
| Douglas-fir, 3-inch top | 0.54 to 0.87 |
| 4-inch top | 0.89 to 1.42 |
| Cost of commercial soaking treatment | |
| Douglas-fir, 3-inch top | 0.65 to 1.08 |
| 4-inch top | 0.94 to 1.44 |
| Lodgepole pine, 3-inch top | 0.40 |
| 4-inch top | 0.65 |
| Cost of home soaking treatment ³ | |
| Douglas-fir, 4-inch top, butt incised | 0.11 to 0.16 |
| not incised | 0.04 to 0.06 |
| Lodgepole pine, 3-inch top, butt incised | 0.19 to 0.28 |

¹ Based on several 1976 estimates for 7-foot posts. Check local prices for best comparison. Prices usually based on purchase of several hundred posts.

² Figure posts at no value or at estimated harvest and production cost if you produce your own posts for treatment.

³ Cost of solution absorbed in a Douglas-fir post soaked for 48 hours at butt end and 6 hours at top, and in lodgepole pine posts soaked for 43 hours at butt end and 24 hours at top end (top end of lodgepole posts could be soaked only 6 hours to reduce cost). Cost of penta concentrate varied with source from \$6.10 to \$9.80 per gallon; diesel oil cost \$0.39 to \$0.45 per gallon. Labor and transportation costs are not included.

A few of our native Oregon woods have naturally durable heartwood and are used for posts without the benefit of a preservative treatment. Durability of their heartwood can vary, even within a tree, and the lighter-colored sapwood just under the bark is never durable. The life of an untreated post is affected both by variations of the natural durability of its heartwood and by its girth or cross section of heartwood near the groundline of the post. Posts of western red cedar, western juniper and Oregon white oak heartwood had an average life of about 20 or more years in tests made by Oregon State University at Corvallis, and should last longer in drier soils east of the Cas-

cares and in Idaho. Soaking the butts of those posts in preservative before installation would likely have extended their average life further by postponing the early failure of the thinner posts and of those having comparatively low natural durability.

Soaking Posts for Longer Service

If you decide to use wood posts and plan to treat them yourself, consider these suggestions:

- For best results, cut and peel posts in spring or early summer and dry and treat them in the warm summer season. Any seasoning checks or cracks that occur after soaking may expose untreated wood.

- A simple and effective do-it-yourself treatment is to merely soak the posts in unheated preservative solution. The equipment can be homemade cheaply and can be designed to soak posts full-length, or just at their butts and tops.

- Pentachlorophenol, or "penta," probably will be the most readily available, reliable, and economical preservative. Buy penta concentrate and mix it with a light oil to make a 5% solution, according to directions on the can.

- Post peeling is hard work, best done by a machine. The more posts you have the more you will become convinced of this. If you wish to peel a few posts by hand, do it in the spring when the bark is loose.

- Incising the peeled posts around the groundline zone before treatment requires extra labor and preservative, but can add years to their life. Incised posts have numerous small punctures into the wood around their groundline, which improves penetration of preservative into that critical zone during the soak treatment.

- Peeled posts should be dried well before being soaked in the penta-oil solution.

Equipment for post soaking

The simplest tank for soaking posts is an up-ended 55-gallon drum with the top end removed. In it you can soak the butts of about a dozen posts at a time; soaked posts then can be lifted out and the ends reversed to soak the tops. Posts can be handled singly by hand, or in bundles with the help of a tractor-mounted lift, a block and tackle, or other power hoists. Despite the extra handling, this method has some advantages over fully immersing the posts; you will need less preservative solution on hand; there is less solution left over after the job is done; and you can apply a lighter treatment to the tops of posts where decay hazard is less than at the butt. The tank must be deep enough to maintain the solution level a few inches

above the posts' groundline—usually about 30 inches of solution depth. Other possibilities are to weld several drums end-to-end or use a stock tank for complete immersion and full-length treatment of posts. If posts are to be fully immersed in the solution, you will also need hold-down weights, chains, or other means to prevent the posts from floating. Whatever sort of tank you may improvise, fill it with water and test it for leaks before pouring in valuable treating solution. Have a separate drain rack, pan, tank, or other means to hold freshly soaked posts and collect for reuse the excess solution which drips from them.

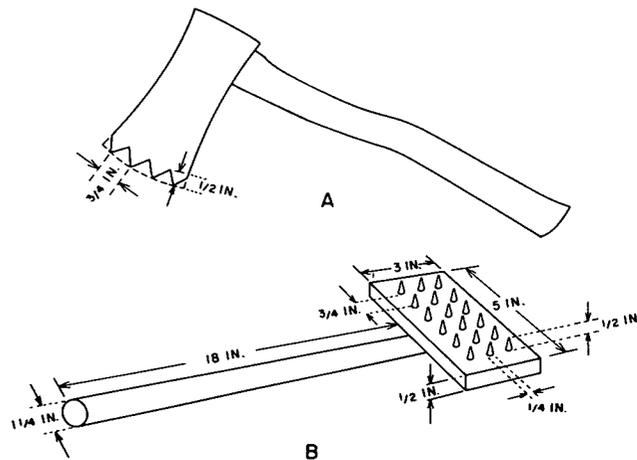
Roof or cover the tanks to protect the solution from rain or other watery contamination, which sinks to the bottom of the tank. Soaking the ends of posts in a layer of water that has collected at the bottom of the tank is a waste of time and effort; not a good preservative treatment. A drain in the bottom of the tank is the easiest way to get rid of the water, or to drain solution from a large tank. If you use it regularly you can cover the tank and store the solution in the tank.

Preparing posts

If you need only a few posts and plan to cut and peel them yourself, do so in the spring or early summer when the bark can be peeled off easily. Peel within a few days after felling the trees, before the bark begins to adhere tightly. A tire iron and axe are helpful peeling tools. Remove all bark down to the wood, especially around the groundline zone; strips of inner bark left on the post will block penetration of the preservative solution.

If you have many posts to peel, or if the bark is not loose enough to peel easily, you might consider having them peeled mechanically. Recent quotations for that service vary from 2 to 5 cents per lineal foot for posts up to 4 inches diameter. Portable peelers can be moved to your place economically if you have enough posts—usually 1,000 or more; otherwise you'll have to transport your posts to the peeler. To locate peeling service in your area, ask your County Extension agent or state or consulting foresters.

After peeling, puncture the groundline zone of the peeled posts to about $\frac{3}{8}$ -inch depth by striking with an incising tool (see illustration). Punctures can be about an inch apart around the post and about 6 inches apart along the length of the incised zone. Incise around the post from about 6 inches above to about 12 inches below the groundline to improve uniformity and depth of preservative penetration into this vulnerable zone where rot usually begins. Incising is best done before the wood dries and hardens. Although it requires extra



Incising tools made by (A) notching the blade of a hatchet, or (B) brazing hardened steel points into holes in a steel plate having a pipe handle welded on.

labor, incising can prevent early post failures and can double the life of penta-soaked posts. Experienced treaters who produce posts commercially may obtain good treatment results without the benefit of incising, but incising is recommended for the novice. If you must omit the incising operation, try to use pine posts; if not glazed with resin during drying, they will absorb the solution more readily and uniformly than most other woods.

Pile the peeled, incised posts criss-crossed, with air spaces between posts and under the pile. The pile should be raised about a foot off the ground on supports of sound wood, cinder blocks, or the like; avoid contact with soil or decayed wood. The area under and around the pile should be cleared of weeds, tall grass, or trash that might interfere with air circulation under and through the pile. The piles may be roofed to prevent excessive checking in the top layer of posts and to protect them from occasional rain. After a couple months of summer weather the piled posts should be dry enough for soaking in the preservative solution.

Mixing the penta-oil solution

Usually it is most economical and convenient to buy penta (pentachlorophenol) as a concentrated solution at farm-supply stores and dilute it with light petroleum oil such as diesel or No. 2 fuel oil. Used crankcase oil is too thick and dirty to penetrate well into wood. Carefully follow the directions on the penta container for mixing the concentrate and oil to get a 5 percent solution; the solution need not be stronger, but should not be any weaker. You can mix the solution right in the treating tank. Follow safety precautions given with the directions on the can. Wear glasses or goggles to protect your eyes from possible splash while mixing and when moving posts in or out of the tank.

To treat a batch of posts in a 55-gallon drum, mix about 25 gallons of solution, which will include some that can be added later during the soak treatment to keep the solution level at about 30 inches up the posts. To each 10 gallons of diesel, add 1 gallon of 10:1 penta concentrate, obtaining 11 gallons of 5 percent solution. During warm weather there should be no difficulty in keeping all the penta dissolved in the oil so as to maintain the solution strength up at the desired penta content of 5 percent; however, stirring or agitating the solution before use is a simple precaution.

Soaking

Avoid treating posts of different kinds of wood in the same batch; they may differ enough in treatability so that some may be undertreated when others have absorbed much more of the costly solution than they need. Load the peeled, dry posts into the soaking tank and weight them down to prevent floating if they are to be fully immersed for a full-length treatment. If posts are upended and soaked one end at a time, they are not likely to float, but be sure the solution level is maintained at least a couple inches above groundline and preferably covers the incisions while the butt end is soaking.

Duration of soaking time required for adequate treatment varies among different woods and also can be much less for the top than for the butt of the post. Table 2 lists the hours of soaking that will give incised posts of several Northwest woods an average life of about 30 years or more in rainy climates, where decay and termite hazards prevail. Notice also in the table that Douglas-fir posts that were butt-soaked for 48 hours lasted twice as long and had fewer early failures if the butts were incised. Other local woods that can be treated similarly to Douglas-fir are west coast hemlock, larch, the pines, and white fir. These should have absorbed adequate solution after their incised butts have soaked for 48 hours and their tops for 6 hours. Even naturally durable split or sawed cedar posts will benefit greatly from soaking for 48 hours at the butt and for an hour or two at the top. After 48 hours, about 70 percent of the potential absorption into the critical butt end usually has occurred. Among our common softwoods, pines generally are the easiest and spruce the most difficult to treat. Some other woods are much more absorbent and can become expensively overtreated if left soaking longer than a few hours. For example, black cottonwood posts need only 6 hours of butt soaking, and red alder, which is not listed in Table 2, should need only 6 to 12 hours; the tops of these absorbent posts need only 1 to 2 hours.

Table 2. Soak treatment of round, incised posts of several woods in penta-oil solution, and their service life in Oregon State University tests.

| Wood | Soak treatment | | Service | | |
|---|----------------|-------|---------------|--------------|------------------|
| | Butt | Top | First failure | Age of posts | Average life |
| | Hours | Hours | Years | Years | Years |
| Black cottonwood | 6 | 1 | 19 | 27 | 35 ⁴ |
| Coast Douglas-fir | 48 | 6 | 19 | 27 | 35 ⁴ |
| Coast Doug ¹ as-fir ¹ | 48 | 6 | 7 | 20 | 15 |
| Coast Douglas-fir | 144 | 48 | 23 | 25 | 35 ⁺⁵ |
| Coast Douglas-fir ² | 168 | 48 | 10 | 25 | 28 ⁴ |
| Oregon maple ³ | 24 | 2 | 8 | 26 | 30 ⁺⁵ |
| Lodgepole pine | 43 | 24 | None | 25 | 35 ⁺⁵ |

¹ Not incised.

² Bark left on above ground; posts were soaked in creosote.

³ These posts became badly split.

⁴ Estimated average life.

⁵ Average life cannot be estimated until more posts fail.

After soaking, remove the posts from the tank and let them drain where the drippings can be collected for reuse.

If you are curious about the quality of your finished treatment, you can split (do not saw) a few posts and look for penetration of the solution, although it may be light colored and difficult to see. Examine the critical groundline zone where penetration at best should be uniform and to the depth of the incisions, approximately $\frac{3}{8}$ inch. If so, you likely will have well-treated posts. It is more difficult and bothersome to evaluate the treatment by weight or volume of solution absorbed in the wood since that involves weights and measurements, and the needed amount will vary with post size and whether posts were soaked full-length or at the ends only. It is easier to pay close attention to these few simple but important rules that should provide for a satisfactory treatment:

- Select sound posts.
- Peel cleanly.
- Incise the groundline zone.
- Dry posts well.
- Soak similar posts in a solution of 5 percent penta in diesel or No. 2 fuel oil for the recommended time.

