SELECTING A SUITABLE METHOD FOR TREATING FENCE POSTS

February 1946

No. R1468

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
FOREST PRODUCTS LABORATORY
Madison, Wisconsin
In Cooperation with the University of Wisconsin
The selection of a treatment to protect wood fence posts against decay and insects is not a simple matter. It is easy to point out the most effective treatment, or the cheapest treatment, on the basis of first cost, but what is most practical for any one individual user depends on a number of circumstances. Each fence post user of necessity must be governed by the conditions that fit his case and must of necessity make certain decisions before selecting a treatment.

Commercial Pressure Treatment

The most effective fence-post treatment known is pressure treatment with coal-tar creosote or mixtures of coal-tar creosote with other oils. Obviously the fact that pressure treatment is highly effective is a matter of no interest to those who live so far from a pressure-treating plant that shipping charges would make the cost of treated posts prohibitive, or those who are not prepared to send at least a carload lot for custom treatment, or who are not prepared to join cooperatively with others to buy a carload lot of posts or have a carload treated.

Although a service life of 25 years may be obtained, the initial cost of pressure-treated posts will not be low. It may run as much as 40 to 60 cents per post, depending on how far they must be shipped. This does not mean that the cost per year¹ will be high. On the contrary, because the posts will have very long life, the cost per year may be among the lowest of any of the several types of treatment. Cost per post per year should, of course, be a determining factor in selection of a post treatment, but lack of ready cash may prohibit the long-run economies of pressure treatment to the majority of farm post users.

All commercial pressure-creosoting companies are familiar with a Government specification covering the pressure treatment of round posts of pine and Douglas-fir with coal-tar creosote, creosote-tar solution, or creosote-petroleum solution.

In some localities it is possible to purchase a limited number of pressure-treated posts from retail lumber dealers or from local pressure treating plants.

¹Technical Note No. 165, "When Preservative Treatment of Wood is an Economy," is available on request from the U. S. Forest Products Laboratory, Madison 5, Wis.

Report No. R1468 -1-
Next to pressure-creosoting in effectiveness is hot-and-cold bath, open
tank treatment in coal-tar creosote or creosote mixtures. In this treat-
ment the posts are heated in the preservative oil for a few hours and are
then submerged in cold oil for a few hours, or they are given the hot bath
and then simply allowed to remain several hours or overnight in the cooling
preservative. The details of this process are described in a Department of
Agriculture Farmer's Bulletin. When posts are well treated by this
method they have an average life of around 20 or more years and will often
last as long as if they had been pressure treated. However, less oil is
sometimes absorbed and less penetration obtained in the open-tank method,
than in the pressure method. If a poor job of hot-and-cold bath treating
is done, the average life of the posts will be considerably less.

Hot-and-cold bath treatment is not cheap and it is not a treatment that can
be effectively applied without proper equipment, considerable hard, dirty
work, and some intelligence. One or more strong, oil-tight tanks, with
provision for heating over an open fire, or preferably by means of heating
coils, are needed for the hot-and-cold bath treatment. The tanks should be
large enough to hold the required number of posts completely submerged and
leave about 18 inches of space between the surface of the oil and the top
of the tank. If not already available, such a tank, and the oil to fill it,
would be costly and the expense can hardly be justified if a considerable
number of posts is not treated. In hot-and-cold bath treating the neces-
sity to guard against fires is always present.

Full-length treatment is necessary in most regions of the United States.
In dry areas where experience has shown that little decay occurs in the
untreated tops of the posts, however, a butt treatment extending 6 to 12
inches above the ground line is sufficient.

The hot-and-cold bath treatment, like a number of others requires not only
the preservative actually taken up by the posts but also the extra amount
needed to keep the posts submerged. For this reason it is desirable to take
any practical measure to reduce the cost of the creosote, which may run as
high as or higher than 50 cents per gallon when purchased in drums in small
quantities. (At the time this is written there is a shortage of creosote
and it is hard to obtain -- February 1946.) The cost can be reduced by
mixing cheaper oils, such as waste crank-case oil, domestic furnace oil,
coal tar, or water-gas tar, with the creosote. Waste crank-case oil is not
suitable for use alone as it is not a good preservative, but mixing it with
an equal amount of coal-tar creosote results in an oil that is much cheaper
than straight creosote and quite effective as a preservative. Some sediment
or sludge will settle out from the mixture, especially after heating, and
this material should be removed. Sometimes water-gas tar can be obtained

Farm Timber," Superintendent of Documents, GPO, Washington 25, D.C., 5c.

Report No. RL468 -2-
cheaply from a local gas plant. Some water-gas tars are nearly as good as coal-tar creosote and are therefore suitable for use alone. Practically all of them can be mixed with coal-tar creosote.

Because of the work, care, and expense involved, the hot-and-cold bath treatment has not been popular with farmers. Nevertheless, thousands of posts have been treated in this way and service records have shown that the treatment gives posts a long life. It should be especially well suited to use by cooperative or similar groups treating a large number of posts.

Pentachlorophenol Cold-soaking Method

A third and newer method of fence post treatment with oil consists in soaking well-seasoned fence posts for a few days in an unheated solution of pentachlorophenol and domestic fuel oil. This treatment calls for the same kind of tank as the hot-and-cold bath treatment, but no heating equipment is needed, and, of course, there is no danger from fire. The soaking period should not be less than 1 or 2 days and it may well be longer if time permits. Good penetrations and absorptions can usually be obtained in well-seasoned pine posts by this method, but posts of some other species do not treat so well. The preservative may cost from 35 to 50 cents per gallon, and at least a half gallon of preservative is needed per post.

Service tests of pentachlorophenol-soaked fence posts have not been under way long enough to demonstrate with finality what the treatment will produce in added service life. Pentachlorophenol, however, is known to have good preservative value, and it seems reasonable to expect that pine posts well penetrated with the solution would give 15 years of service. With especially good treatment the service life may be considerably longer.

The pentachlorophenol cold-soaking treatment and its suitability for various species of wood are described in detail in a report of the Forest Products Laboratory. 2

The first cost of the hot-and-cold bath and pentachlorophenol treatments will vary widely with the circumstances of the individual or group doing the treatment. In some cases costs may approach the cost of pressure-creosoted posts. Items that enter the calculation of cost and arriving at a decision as to choice of treatment or the advisability of using any treatment whatever include the following: availability and cost of naturally durable posts, service life and cost of posts now being used, number of posts to be treated, availability or cost of treating tanks, possibility of reducing the cost of creosote (in the case of the hot-and-cold bath method) by use of cheaper oils, actual cost or value charged to the labor (some farmers

---

2 Report No. R1445, "Treating Wood in Pentachlorophenol Solutions by the Cold-soaking Method," is available on request from the U. S. Forest Products Laboratory, Madison 5, Wis.
may do much of the work themselves as an off-season activity without actual outlay of funds for labor.

**Water-borne Preservative Treatments**

Where the cash outlay must be kept as low as possible there are other treatments available. Such treatments may be satisfactory to the man who cuts his own posts, hires no help, and can therefore reduce the first cost of treatment low enough to get a reasonable cost per post per year. Under such circumstances preservatives, such as zinc chloride or chromated zinc chloride dissolved in water, have value because they cost only the 5 to 15 cents for the pound that is generally enough to treat one post. These preservatives are clean and safe to handle. They are available in dry form or in the form of strong water solutions that can be diluted before use.

**Tub or Trough Treatment with Zinc Chloride**

What seems to be the simplest post treatment with zinc chloride solution is one that has been used by Clemson Agricultural College, Clemson, South Carolina. In this treatment freshly cut, unweathered posts are set on end in a tub or other container into which a measured amount of zinc chloride solution or chromated zinc chloride solution has been poured. The posts are allowed to stand in the solution until it has been entirely absorbed. A 4 day or more may be required. The Clemson Agricultural College publication on this process should be obtained before the treatment is attempted. It is said to work well with Southern pine posts, but is not yet definitely known to work well with other species. The treatment has not been in use long enough to demonstrate how long the treated posts will last or how many species other than the Southern pines can be successfully treated. However, it seems reasonable to expect that if 5 pounds of 20 percent solution of zinc chloride can be gotten into a post of average size a life of 10 years should be obtained.

**Tire-tube Treatment with Zinc Chloride**

Less simple is the treatment known as the tire-tube treatment developed by the Forest Products Laboratory. Zinc chloride is also used in this treatment. Essentially the method consists in fastening a section of inner tube to one end of a green post and pouring into it a measured amount of a solution of zinc chloride or chromated zinc chloride. This treatment also should not be attempted without the helpful instructions found in the appropriate report.

---

1. Circular 262, Clemson Agricultural College, Clemson, S. C.
2. Report No. RL158, "Tire-tube Method of Fence Post Treatment," is available on request from the U. S. Forest Products Laboratory, Madison 5, Wis.

Report No. RL1468
of the Forest Products Laboratory. In the absence of adequate service records of long duration the average life from posts treated by this method is estimated at about 10 years.

Treatment Devised by Bureau of Entomology and Plant Quarantine

The U. S. Bureau of Entomology and Plant Quarantine has developed another means of treating posts with zinc chloride and other water-borne preservatives. This treatment is applied to standing or freshly-felled trees before they are cut into posts. The average life to be expected from posts so treated is estimated to be in the same ranges as for the tire-tube and trough methods. Detailed instructions for applying this treatment are also available in a publication.

Full-length Steeping Treatment

A fourth method of using zinc chloride preservatives is through the steeping method -- simply by soaking peeled posts, green or seasoned, in a tank of preservative solution, completely submerged, for about a week. Posts treated in this way have lasted from 12 to 15 years in Wisconsin, Montana, and Nebraska. In sections where soil and climate are more favorable for the leaching of the water-soluble preservatives a shorter life could be expected. This treatment is described in a publication of the Forest Products Laboratory. Aside from the somewhat longer life likely to be obtained with the full-length steeping treatment the choice of one of the foregoing zinc chloride treatments is largely a matter of personal preference and experience.

Brushing, Spraying, or Dipping Treatments

Regardless of the preservative used, low penetrations and absorptions of preservative will not add much to service life of posts. For this reason brushing, spraying, or dipping in oils or water solutions cannot be expected to add more than 1 to 3 years to post life. No matter how energetically promoted they should be recognized as not equal to deep treatment with a reliable preservative of known composition.


7Report No. R1468, "Preservation of Timber by the Steeping Process," is available on request from the U. S. Forest Products Laboratory, Madison 5, Wis.

Report No. R1468
Proprietary Preservatives

Trade-name preservatives vary widely in effectiveness. Some of them are good, as demonstrated by service records. The number of users of a preservative should not be taken alone as evidence that they are good. The companies making good proprietary preservatives usually can furnish evidence of effectiveness. Preservatives of secret composition are especially subject to suspicion.

Efforts are continuing to develop post preservatives and methods combining high effectiveness and low cost. Although the problem is a difficult one, progress is being made and post treatments better than anything now known should eventually be forthcoming.