

# Agricultural Experiment Station

COLUMBIA, MISSOURI, DECEMBER, 1911

CIRCULAR NO. 51

## HOW TO PROLONG THE LIFE OF FENCE POSTS.

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The chief requirement in a wood for a fence post is durability. For this reason cedar, white oak, and locust have long been the principle trees used. Although formerly plentiful over large portions of the country, these trees are now in many sections becoming too scarce and high priced to be used for this purpose. Substitutes either in the form of iron or re-enforced concrete, or of the less durable woods will soon have to take their place. It is doubtful whether iron or re-enforced concrete will ever come into common use for fence posts, because such posts are too expensive. Nearly every woodlot however contains trees that are not now utilized to any extent for fence posts, because their woods are not durable in contact with the soil, such as maple, birch, beech, cottonwood, willow, hickory, elm, etc. Fortunately such woods can be made durable at small expense by a preservative treatment and can then be utilized in the place of the more durable woods. Posts that ordinarily last but three or four years in the ground can be made to last over twenty years by preserving the wood from decay.

### WHY WOOD DECAYS.

Wood does not decay for the same reason that iron rusts or that rock weathers; but because of the destruction of the tissues of the wood by low forms of plant life called fungi. These plant forms live inside the wood, breaking down the wood fibres and producing what we call decay. After they have gained a strong foothold in the wood the fungus plant produces the characteristic fruiting bodies or shelves so common on the outside of decaying wood. In these the spores are produced which are scattered by the wind, spreading the decay to other wood.

Like other forms of plant life, fungi require for their growth and development moisture, air, heat, and food. A fence post decays most quickly at the surface of the ground because there the conditions of air and moisture are most favorable to the growth of the fungi. The decay is much slower in the top of the post because the wood quickly dries out after it has become wet, and very slowly indeed below the surface of the ground because of the lack of air. If the fungus is deprived of any one of these factors of growth it cannot live. Wood that is kept thoroughly dry cannot decay. A table made of the most perishable wood will last indefinitely in a house. Wood immersed in water cannot decay because

of lack of air. Bog oak is dug from the swamps in Ireland where it has lain for centuries and made into furniture. Wood decays very slowly in the cold northern regions. Wood that has been poisoned so that the fungus is deprived of its food supply will never decay as long as the poison remains in the wood.

#### **SIMPLE METHOD OF PROLONGING THE LIFE OF FENCE POSTS.**

Any method by which wood can be kept dry or that will tend to prevent the entrance of the fungus plant, will prolong the life of fence posts. Piling stones, ashes, or gravel about the base or setting the post in cement or concrete, will help to drain away the moisture and will prevent the growth of weeds, which keep the air from circulating freely around the post. Thoroughly seasoned posts will last much longer than those that are set green. Good results have been obtained by charring the ends of the posts over an open fire. The posts must be thoroughly seasoned to prevent splitting or checking, and the charring must extend at least six inches above the surface of the ground when the post is set. Painting surface of the post or coating with some preservative substance like tar, petroleum, or creosote will help to keep out the moisture and will also tend to prevent the entrance of fungi. To be effective this "brush treatment" as it is called, should only be applied to thoroughly seasoned posts. Where creosote or a similar preservative is used it should be applied hot and at least two coats given. One of the defects of a brush or surface treatment is that it is difficult to get the preservative into all the cracks and checks. This can be overcome by dipping the posts in the hot preservative. At best, surface coatings are not durable. They are easily broken or worn off exposing the wood to fungi and admitting moisture to the interior of the post.

#### **HOW TO PRESERVE FENCE POSTS BY THE USE OF CREOSOTE.**

The most effective method of preserving fence posts is to thoroughly impregnate the outer layers of the wood with some preservative substance that will poison the wood and deprive the fungus plant of its food. Many substances have been used for this purpose, but the cheapest and most effective is creosote, or dead oil of coal tar, formed as a by-product in the manufacture of coal gas. It is not only poisonous to the fungus plant but being an oil, it also tends to exclude moisture from the wood. Most of the high priced, patented preservatives have this substance as their base.

The treatment is best carried out by the so called "open tank method." Thoroughly seasoned posts are heated for several hours in hot creosote and then allowed to cool down in cold creosote. When the posts are heated in hot creosote the high temperature causes the air and water in the wood to expand so that a portion of this air and water is forced out. When the posts are then placed in cold creosote, the air and water left in the wood contract, forming a partial vacuum; and the creosote is forced into the wood by atmospheric pressure, to take the place of the air and water that have been forced out. This forms a shell of creosoted wood from one-eighth of an inch to two inches in thickness around the post, that effectively excludes moisture and prevents the entrance of fungi.

**HOW TO APPLY THE TREATMENT.**

Where a large number of posts are to be treated, it can be done more quickly and economically by using two tanks. The posts are heated for several hours in boiling hot creosote in the heating tank and then immediately transferred to the second tank to cool for about an equal length of time in cold creosote. But for treating a few posts for farm use the single tank method is advised. In this case the posts are allowed to cool down in the tank in which they were heated. As good results can be obtained by the use of one tank as with two.

The simplest form of treating tank would consist of an iron tank four feet high and about three feet in diameter, set up over a brick fireplace with a stove pipe smoke stack. Such an outfit will cost about twelve or fifteen dollars. Often an old iron boiler

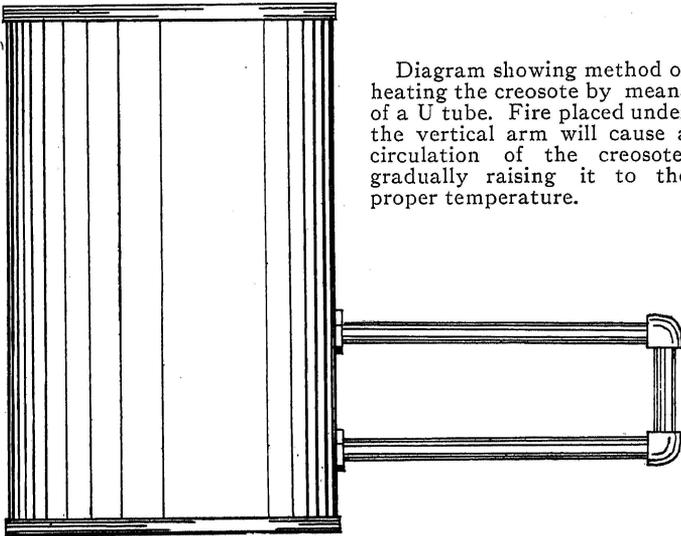


Diagram showing method of heating the creosote by means of a U tube. Fire placed under the vertical arm will cause a circulation of the creosote, gradually raising it to the proper temperature.

can be found that will answer the purpose. A galvanized iron tank has usually too thin a bottom to set up over an open fire. Such a tank however can be utilized and heated by means of a three-inch U tube (See Diagram). In this case since the creosote is very inflammable it should be shielded from the open fire. In either case a false bottom should be placed in the tank for the posts to rest upon.

**PREPARATION OF THE POSTS FOR TREATMENT.**

The posts should be thoroughly seasoned before treatment as the presence of much water in the wood tends to prevent the entrance of the creosote. Ordinarily posts loosely piled will season sufficiently in from five to seven weeks. All the bark should be removed, especially the papery inner bark, as it prevents the creosote from entering the wood. Usually only about forty inches of the lower end of the post is treated. This will bring the treated portion of the posts six to eight inches above the surface of the ground when

the posts are set. It is at the surface of the ground where the fastest decay takes place. Unless the wood is very perishable it is not usual to treat the tops of the posts, but it can be easily done by inverting the post in the tank after one end has been treated. Merely dipping the tops in the hot creosote will have a favorable effect. When the tops are not to be treated it is well to cut them off obliquely so as to shed the rain.

Where posts are to be given a preservative treatment it is possible to select a much smaller post than is generally used. Large posts are selected for fence posts because they will last longer than small ones before decay sets in. A fence post of five inches average diameter is large enough and strong enough for the line posts and is the best size for the preservative treatment. Round posts are preferable to split posts because heartwood, except in the case of cottonwood and sycamore, does not absorb the creosote readily.

#### **CARRYING OUT THE TREATMENT IN A SINGLE TANK.**

Creosote which at ordinary temperatures is not a liquid, should be heated in the tank to about 220 degrees F. or just above the boiling point. A higher temperature will tend to weaken the wood and a large amount of the creosote will be evaporated. The tank should then be filled with fence posts. Sufficient creosote should be used to cover at least the lower forty inches of the posts. After heating for a couple of hours the fire should be withdrawn and the posts left in the creosote until they have cooled down. The posts will then be treated.

Two runs of posts can easily be treated in a day on the farm without interfering with the regular work. The tank can be filled with posts in the morning and a fire built that will last about two hours before burning out. The posts after being heated will cool down during the day and by night will be treated. A new run of posts can be put in, heated as before for two hours, and allowed to cool down over night. In cool weather the tank will cool down fast enough so that it will be possible to start a new run at noon. In this way three runs of fifteen to twenty posts each can be treated without much effort each day.

#### **COST OF THE TREATMENT.**

Creosote costs from fifteen to twenty cents a gallon in fifty gallon barrels, the cost varying with the location, transportation facilities, etc. A gallon of creosote should treat three or four posts or more depending on the kind of wood, some woods absorbing the creosote readily. To a farmer who furnishes his own labor the cost should not be above six or eight cents a post.

#### **EFFECTIVENESS OF THE TREATMENT.**

The advantage of a preservative treatment lies in the fact that it permits the utilization of material for fence posts from the woodlot, or of material that can be purchased at a low price, which ordinarily could not be used for this purpose. Such posts even with the cost of treatment added will amount to less than the original cost of a durable post. As to length of life a well creosoted post of perishable wood will outlast by many years the most durable fence post.