# **EMERGENCY FUEL FROM THE** FARM WOODLAND

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## CIRCULAR 79, OFFICE OF THE SECRETARY UNITED STATES DEPARTMENT OF AGRICULTURE

#### Contribution from the Forest Service, Henry S. Graves, Forester, and the States Relations Service, A. C. True, Director

Washington, D. C.

October, 1917

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WASHINGTON GOVERNMENT PRINTING OFFICE 1117

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# EMERGENCY FUEL FROM THE FARM WOODLAND.

#### SUPPLEMENTING THE COAL SUPPLY.

**B**ECAUSE OF THE HEAVY DEMAND FOR COAL, both for commercial as well as domestic use, and because of the great burden laid upon the Nation's transportation facilities and the possible shortage of coal in certain sections of the country, the demand should be relieved wherever feasible. Farmers frequently are situated so they can profitably supply fuel from their woodlands and thus relieve, to a considerable extent, the demand for coal.

A maximum price for coal has been fixed by the Government. This does not mean, however, that the railroads will be able to transport all of the coal which the consumers may desire or want. Every freight car is performing a heavy duty; and the fewer the cars that are used for coal the greater will be the number available for carrying other war commodities.

Manufacturers, of course, can not substitute wood for coal; neither can city people, because this would result in even greater raihoad congestion. Nor is it likely that in either the South or the West the use of wood for fuel can be greatly increased. But in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, and Missouri it ought to be entirely practicable in many cases to replace coal with wood for fuel. In these 17 States is a rural population of about 20,000,000, which, it is estimated, uses annually about 18,000,000 tons of coal. If, by substituting wood, one-quarter of the coal burned by farmers and onetenth of the coal burned in villages could be saved, the total saving would amount to nearly 3,000,000 tons, or between 65,000 and 70,000 carloads.

It is where team-hauled wood can be used in place of railroadhauled coal that the change should be made. Farmers who own woodlands and people in villages who can purchase wood from nearby farms are the ones in the best position to reduce their consumption of coal. It is not expected substitution of wood for coal will be complete or universal; for many purposes coal is much more convenient. But for heating many kinds of buildings wood is the more convenient

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and cheaper fuel. This is particularly true in the case of churches, halls, summer cottages, and other buildings for which heat is required only occasionally; but is then wanted in large volume at short notice.

Furnaces are built especially for burning wood in 3 or 4 foot lengths. Short lengths, of course, can readily be burned in an ordinary coal furnace or in a box stove, though this is rather wasteful of fuel. Many furnace manufacturers, however, make a special wood grate for use in their furnaces. One advantage in burning wood is that on moderately cool days the furnace can be run at a lower ebb than when coal is used, consuming only enough fuel to remove the chill. When wood is used in a round pot furnace, care should be taken to have each piece lie flat.

If a stove grate is too coarse for wood, a sheet iron cover over a good part of the surface will make it suitable, or a few fire bricks can be used. Wood grates are sold which are made in two pieces and which can be inserted through the fire door and placed on top of the regular grate.

#### RELATIVE HEATING VALUE OF WOOD AND COAL.

In the matter of heating value, one standard cord of well-seasoned hickory, oak, beech, birch, hard maple, ash, elm, locust, or cherry is approximately equal to one ton (2,000 pounds) of anthracite coal. It takes a cord and a half of soft maple and two cords of cedar, poplar, or basswood, however, to give the same amount of heat.

One cord of mixed wood well seasoned equals in heating value at least one ton (2,000 pounds) of average-grade bituminous coal.

Table 1 shows the price which the consumer can afford to pay for a cord of wood as the equivalent of anthracite coal at various prices.

TABLE 1.—Prices which the consumer can afford to pay for wood as a substitute for coal.

Price of	Equivalent price for wood delivered in stove lengths.				
coal de- livered.	Hickory, o hard maple locust,	ak, beech, e, ash, elm, cherry.	Soft maple, cedar, poplar, basswood.		
Per ton.	Per cord.	Per run.	Per cord.	Per run.	
$\begin{array}{c} \$5.00\\ 6.00\\ 7.00\\ 8.00\\ 9.00\\ 10.00\\ 11.00\\ 12.00\\ \end{array}$	\$5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00	$\begin{array}{c} \$1.66\\ 2.00\\ 2.33\\ 2.66\\ 3.00\\ 3.33\\ 3.66\\ 4.00 \end{array}$	$\begin{array}{c} \$2.50\\ 3.00\\ 3.50\\ 4.00\\ 4.50\\ 5.00\\ 5.50\\ 6.00\\ \end{array}$	\$0. 83 1. 00 1. 16 1. 33 1. 50 1. 66 1. 83 2. 00	

If the consumer can buy coal at \$8 a ton, it would hardly be worth his while to burn first-class wood at \$8 a cord, except in an open fireplace, because coal is a more convenient fuel. If, however, coal becomes so scarce that it can not be secured in sufficient quantities, the consumer will, in some cases, have to burn wood at \$10 or even \$15 a cord. In many sections wood is selling at the latter prices at the time of writing (September 17).

#### METHODS OF MAKING CORDWOOD.

The most common method of making cordwood is to cut the trees into 4-foot lengths with the ax and split the larger pieces. The pieces are then piled in a standard cord, which is 8 feet long, 4 feet high, and 4 feet wide. The contents are 128 cubic feet, of which about 70 per cent is wood and 30 per cent air. Wood cut 4 feet long can be sold to brickyards, limekilns, metal-working plants, and other industries, but is too large for household use. This method is used chiefly where the tree growth is comparatively small, as in second growth, because such wood splits easily.

Another method, and one better adapted for old growth hardwoods, which are difficult to split, is to saw the tree into logs of convenient lengths, say from 10 to 15 feet. These are "snaked" out to the edge of the woodland and there sawed and split into lengths proper for the stove or furnace. The sawing is usually done by machine, driven either by gasoline or by electricity. The wood is piled 4 feet high and 8 feet long, such a pile being called a "stovewood" or "running" cord or "run." When the wood is sawed into 16-inch lengths, as is customary with stove material, three runs are theoretically equivalent to one cord. Actually they contain somewhat more wood, since small pieces can be packed more closely than larger ones.

#### WOOD A PROFITABLE FARM CROP.

Firewood ought to bring a better profit this year than ever before, on account of the higher prices which are likely to prevail. Wood is a much less perishable crop than many which the farmer raises. When properly piled, the better kinds of wood will last from two to three years, though it steadily deteriorates after the first year. To have the best heating value, as well as to reduce the cost of hauling, wood should be thoroughly seasoned, which means air-drying it from six to eight months. When piled so as to get a good circulation of air, however, 50 per cent of the moisture may be removed in three months. Wood cut in October and November, therefore, may be burned the latter part of the winter.

Formerly it was common practice to have wood cut by contract for from \$1 to \$1.50 per cord. With the present high price of labor, however, the cost may exceed \$2 a cord. The great difficulty in securing farm labor is during the harvesting period. If farmers can secure sufficient labor to harvest their crops, they should be able to keep enough men to cut and haul wood later in the season. In fact, the profitable employment of one or two extra men on the farm during the winter may help to solve labor difficulties during the rush season.

Hauling wood costs from 50 to 70 cents per cord per mile,<sup>1</sup> according to the cost of teams. The winter employment of teams reduces their cost for other farm work, and with the present high price of grain this is an important item in all computations of farm-labor income. Assuming the cost of cutting as \$2 per cord and of hauling as 50 cents a mile, Table 2 indicates the distance which wood may be hauled while giving a profit of \$2 a cord to cover stumpage value:

 TABLE 2.—Hauling distances that allow a profit of \$2 per cord of wood sold at various prices.

		Miles.
\$4.00	 1	0
6.00	 	4
8.00	 	8
10.00	 	12
12.00	 	16
14.00	 	20

#### OPPORTUNITY TO IMPROVE THE WOODLAND.

The prices which cordwood will likely bring this year offer an opportunity for the farmer to improve his woodland. Improving the woodland means weeding out the poorer trees. In the past this has seldom been practicable, for the inferior wood was not marketable. With wood bringing only from \$4 to \$5 a cord, there is very little opportunity to secure a profit of even \$1 a cord. But with the prices indicated for the coming winter, thinnings become practicable over a wide range of country in the vicinity of good markets.

Some of the things to remember when cutting in the woodland are:

1. Dead and dying trees should be removed. This not only utilizes material which is fairly dry, and which would otherwise be wasted, but lessens the danger of fire.

<sup>&</sup>lt;sup>1</sup> New Hampshire Col. Agr., Ext. Press Bul. No. 77. The Fuel Situation, by K. W. Woodward.

2. Good sound straight logs ordinarily should not be used for fuel, since they are more valuable for lumber. There is a great difference between the prices paid for logs of different grades, even of the same kind of wood. Branches, crooked and decayed logs, trunks broken in felling or otherwise defective, should be used for firewood.

3. Trees likely to be attacked by insects or fungi should be removed to safeguard those which remain. In eastern New England, for example, the gipsy moth is a serious enemy of the aspen, basswood, beech, gray and paper birch, boxelder, serviceberry, dwarf and staghorn sumac, tamarack, glaucous willow, witch hazel, and practically all the native oaks.<sup>1</sup> Several of these species are of little value and can well be removed, thus reducing the food available for the insects. Where the chestnut blight is serious, the chestnut should be largely cut.

4. No portion of the woodland should be cut clean unless the owner has carefully considered the matter and decided that that particular part is best adapted for farm purposes or that he will replant it with forest trees. Old trees, where they predominate, should be gradually removed, since they are not increasing in value. The next generation of trees will be largely determined by those which are left for seed. The successful dairyman studies his records as kept by the cowtesting association, sells his less profitable cows, and breeds those which are producing the greatest amount of butter fat. In the same way the successful woodland owner will study the growth and uses of the different kinds of trees. He will then cut out those of little value and slow growth and keep for seed purposes those which will produce valuable lumber in a relatively short time. Table 3 classifies in a general way the trees which should be favored and those which should be removed for fuel. Inferior individuals of the better species, e. g., those which are diseased or which are likely to be blown over, should, of course, be cut.

TABLE	3.—Trees	to leave in	n the woodland	and those to	remove.	for fuel
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Region.	Species to be favored for lumber. Other things being equal, these should be left.	Species of less value for lumber, or slow growing. These should be cut.
New England and North Atlantic States.	White pine, red spruce, balsam, chestnut, white and red oak, hard maple, yellow birch, tulip poplar, white ash, hickory, bassword	Hemlock, arborvitæ, black and scarlet oak, red maple, beech, gum, elm, gray birch, iron- wood.
Ohio, Indiana. Illinois, and southeast Missouri.	Yellow poplar, black walnut, red gum, white and red oak, cottonwood, hickory, white ash, hard maple, basswood.	Black oak, red ehn, beech, red maple.
Northern Michigan, Wis- consin, Minnesota. Southern Michigan, Wis- consin, Minnesota.	White and red pine, aspen, yellow birch, basswood, red oak, white ash, hard maple. White and red oak, white ash, basswood, hickory, hard maple.	Jack pine, hemlock, searlet and black oak, elm, beech. Black oak, red elm, beech.

<sup>1</sup> U. S. Dept. Agr. Bul. 484 (1917). Control of the Gipsy Moth by Forest Management, by G. E. Clement and Willis Munro.

To secure a second growth of better trees, several things must be borne in mind: (a) Too large openings should not be made, because the ground will dry out and weeds, like berry bushes, will come in and crowd out the young trees. For this reason it is often a good plan to leave some of the inferior trees for shade. (b) Some trees, like the oaks, hickories, and beech, have heavy seeds or nuts which can not be transported any distance except by animals or birds, while others like the birch, maple, ash, and basswood have light seeds which are carried long distances by the wind. For this reason more frequent seed trees of the nut varieties are necessary to get a good stocking of young trees.

5. Woodlands made up of a nearly even-aged stand of second growth are more comparable to the garden than to the dairy. Here the problem is to remove the weeds as a means of getting a quicker yield of timber. The small stunted trees are the weeds, since they can never make a normal growth. The large healthy trees should be favored, because they will grow rapidly to maturity. They are not to be confused with the mature trees in the old woodland, though in general the same species will be favored in both cases.

#### OWNER SHOULD SECURE EXPERT ADVICE.

The foregoing suggestions regarding methods of cutting should be taken simply as suggestions. The woodland owner who wishes to avail himself of the opportunity to improve his woodland, which the high price of wood makes possible, should secure specific information from some reliable forester. In States having a State forester, application should be made to him. In others application should be made to the county agent, the State agricultural college, or to the United States Forest Service, Washington, D. C.

### COMMUNITY ACTION REGARDING WOOD SUPPLY.

Communities which feel they are threatened with a serious fuel shortage will do well to take measures to stimulate the cutting of wood. Farmers may hesitate because of the high cost of labor to invest money in this way. If, however, a minimum price sufficient to allow them a fair profit could be guaranteed by the consumer they would cut all that was needed for the community. Such contracts should be placed as early as possible, so that the wood may be properly seasoned.

Since few farmers get out enough wood to require a stovewood mill as part of their equipment, it is suggested that a group of farmers operate such a mill cooperatively. In many localities the farmers' club would be an admirable organization for such an undertaking.

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