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WOOD
as a fuel resource

The energy crisis is bringing renewed interest in wood as a fuel resource. Whether this means using wood for house heating or fireplaces, there are certain facts to remember. Not only do heat values (Btu's) vary greatly among species, but wood moisture content, density, and growth rate are important considerations.

Dry Wood Important

It is important to condition wood fuel to an air-dried moisture content of 15-25 percent. When a tree is first cut it may have a moisture content of 100 percent, meaning that water and wood are present in equal amounts. Green wood that is dried under cover may be brought to a moisture content of about 20 percent in 6-9 months, depending on drying conditions. Good air circulation, piling for maximum end-grain exposure, and splitting larger pieces will insure faster drying. Burning green wood (above 25 percent moisture content) is not generally recommended because this may cause heavy buildup of creosote in stove or fireplace flues. Buildup of combustible substances can occur in chimneys, cause a backup, smoke, and can ooze a black, oily substance out of stovepipes and often down walls.

Cord Measurement

The standard cord is usually a pile of wood 8 feet long, 4 feet wide, and 4 feet high, occupying a space of 128 cubic feet. The amount of solid wood present is considerably less than 128 cubic feet because of empty spaces between the sticks. It is customary to assume a well piled standard cord contains 90 cubic feet of solid wood, although local ordinances may require more (110 cubic feet in St. Paul). Other terms are frequently used to describe quantities of wood — such as the "rick" or "fireplace" cord. Both terms refer to piles of wood that measure one-third the amount of solid wood in the standard cord (i.e., 1/3 x 90 = 30 cubic feet). Common lengths of wood marketed for fireplace use are 16 and 22 inches, but others can range from 12-36 inches.

Fireplace Use of Wood

Compared to the wood-burning stove or furnace, the fireplace is an uneconomical means of heating a house. This is especially true in Minnesota where overnight temperatures of below zero are common in January and February. If one could afford to operate a fireplace on a 24-hour basis, a certain amount of heating value is obtained. This would be especially beneficial in emergency situations where the primary heating system is not functioning. However, most fireplace owners operate units intermittently, such as during the afternoon or evening hours. While the unit is in operation, it does provide some heat to the house, but the cooling period serves to drain heat from the house. Unless the fireplace has a glass screen, excessive amounts of heated air escape up the flue. On a cold night, such loss would probably be far greater than any heat gained from operating the fireplace.

Heat values are not the only basis for selection of fireplace woods. The fragrance of the wood or whether excessive sparks are produced when the wood burns are other considerations. Some of the properties of commonly used fireplace woods appear in the following table.

Characteristics of Woods for Fireplace Use*

Species	Ease of starting	Coaling qualities	Sparks	Fragrance	Heating class (1 best)
Apple	Poor	Excellent	Few	Excellent	2
Ash	Fair	Good	Few	Slight	2
Beech	Poor	Good	Few	Slight	1
Birch (white)	Good	Good	Moderate	Slight	2
Cherry	Poor	Excellent	Few	Excellent	2
Cedar	Excellent	Poor	Many	Good	3
Elm	Fair	Good	Very few	Fair	2
Hemlock	Good	Low	Many	Good	3
Hickory	Fair	Excellent	Moderate	Slight	1
Locusts (black)	Poor	Excellent	Very few	Slight	1
Maple (sugar)	Poor	Excellent	Few	Good	1
Oak (red)	Poor	Excellent	Few	Fair	1
Pine	Excellent	Poor	Moderate	Good	3

*Forestry Facts, December 1973. Quarterly publication of the Maine Cooperative Extension Service.

A Note On Diseased Wood

Both Dutch elm and oak wilt disease are common in Minnesota today. There is no reason why parts of these diseased trees cannot be used for fireplace wood, but certain precautions must be observed. To minimize spread of these diseases, it is best to remove and use infected material only from September 15 to April 15. Any dead elm wood not used by April 15 should have the bark removed and burned. This prevents the disease-carrying beetles from emerging and infecting healthy elms. Similar bark removal precautions and subsequent burning apply to diseased oak logs, too. Debarked elm and oak wood can then be safely stored and used later in the fireplace.

Heat Value of Cordwood*

Species	Weight (pounds) Air-dry	Weight (pounds) Green	Available heat units per cord of 90 solid cubic feet (in millions (Btu's) Air-dry	Available heat units per cord of 90 solid cubic feet (in millions (Btu's) Green	Percent of short ton coal value Air-dry percent	Percent of short ton coal value Green percent
Hickory	4,600	5,700	24.8	23.1	95	89
White Oak	4,300	5,600	23.9	22.4	92	86
Sugar Maple	3,900	5,000	21.8	20.4	84	78
Red Oak	3,900	5,800	21.7	19.6	83	75
Beech	3,900	5,000	20.9	19.7	80	76
Yellow Birch	4,000	5,100	20.9	19.4	80	75
Paper Birch	3,800	---	18.2	16.7	70	64
White Ash	3,800	4,300	20.5	19.9	79	77
Red Maple	3,200	4,700	19.1	17.6	73	68
Gray Birch	3,500	---	17.5	16.1	68	62
Elm	3,100	4,400	17.7	15.8	68	61
Pitch Pine	3,200	4,900	18.5	16.4	71	63
Norway Pine	2,800	3,500	17.8	16.8	68	65
Red Spruce	2,600	3,000	15.0	14.2	58	55
Aspen	2,400	4,200	14.1	12.2	54	47
White Pine	2,700	3,500	14.2	12.9	55	50
Hemlock	2,600	4,400	15.0	12.8	58	49
Balsam	2,200	3,700	13.5	11.5	52	46

*Based on data of Forest Products Laboratory, Madison, Wisconsin, weights for air-dry, and green wood and assuming 7,350 Btu's available per pound of dry wood with flue gases at 300°F. From Btu's Bulletin 753, USDA.