

UI Extension Forestry Information Series

Firewood Selection

Don Hanley

Selection of firewood species is important if you are to be satisfied with the performance of your fireplace or stove. For example, if you live in northern Idaho and would like to have an aesthetic fire that starts easily and burns rapidly, you might select a mixture of grand fir and white pine. If you are concerned with maximum heat output, Douglas-fir or western larch are good choices. A mixture of rapid burning wood such as white pine and a slower burning wood such as larch provides a good average fire.

The tables in this publication show the types of wood available by geographic regions within Idaho and some of the characteristics of various woods. Firewood supplies are best in forests located furthest from cities. Closer to large population areas, the demand for wood outstrips the availability of the preferred species. Generally, dead trees are the most desirable because they can be split and burned immediately without needing a seasoning period.

Wood Amounts Required. The amount of wood you will need depends on the species (heat value) and the amount of fireplace or stove use per day. Generally, if you burn a fire in a traditional fireplace (low efficiency) 3 to 4 nights a week, you will probably require about

2 cords per winter. However, if you have a fire going all day, everyday, you could burn up to 10 cords. The more efficient, slow-combustion stoves on the market today will reduce this by more than one-half. Table 5 shows the average number of cords that can be obtained per tree by tree diameter for medium height trees of several Idaho softwood species.

If you purchase firewood, only buy wood that is stacked into cords or multiples of this basic unit. A cord is defined as a stack (not a rounded pile) of split wood containing 128 cubic foot volume (including air spaces between the pieces of wood). A standard cord is 4 feet high, 8 feet wide, and 4 feet deep. However, any stack of wood which has a volume of 128 cubic feet contains a cord of wood. Generally, this traditional unit contains 80 cubic feet of solid wood.

To calculate the number of cords in a stack of wood, multiply the pile's height by its length and then by stick length (all in feet). Then divide by 128.

This information first appeared as CIS 472 and was part of the *Wood as a Fuel Series*.

About the Author: *Dr. Don Hanley* is a former Extension Forester and Professor at the University of Idaho.

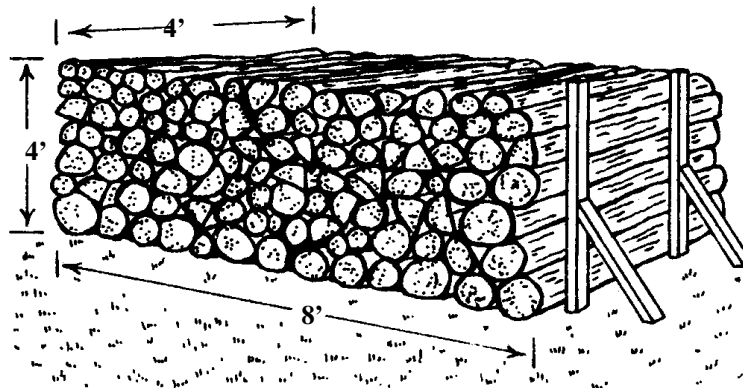


Table 1. Types of wood available by county, northern Idaho.

| | Boundary | Bonner | Kootenai | Benewah | Shoshone | Latah | Clearwater | Nez Perce | Lewis | Idaho |
|-----------------------|----------|--------|----------|---------|----------|-------|------------|-----------|-------|-------|
| Aspen | X | X | X | X | X | X | X | X | X | X |
| Cottonwood | X | X | X | X | X | X | X | X | X | X |
| Douglas-fir (red fir) | X | X | X | X | X | X | X | X | X | X |
| Engelmann spruce | X | X | X | X | X | X | X | X | X | X |
| Grand fir (white fir) | X | X | X | X | X | X | X | X | X | X |
| Hemlock | X | X | X | X | X | X | X | X | X | X |
| Juniper | X | X | | | | | | | | |
| Lodgepole pine | X | X | X | X | X | X | X | | | X |
| Paper birch | X | X | X | X | X | X | X | X | X | X |
| Ponderosa pine | X | X | X | X | X | X | X | X | X | X |
| Red Alder | X | X | X | | | | | | | X |
| Subalpine fir | X | X | X | X | X | X | X | | | X |
| Larch (tamarack) | X | X | X | X | X | X | X | X | X | X |
| Western white pine | X | X | X | X | X | X | X | | | X |
| Willow | | | | | | X | | X | X | X |

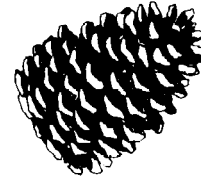


Table 2. Types of wood available by county, central Idaho.

| | Lemhi | Custer | Butte | Camas | Blaine | Gooding | Lincoln | Minidoka | Jerome | Twin Falls | Cassia |
|-----------------------|-------|--------|-------|-------|--------|---------|---------|----------|--------|------------|--------|
| Aspen | x | x | x | x | x | | | | | | x |
| Cottonwood | x | x | | | x | | | | | x | |
| Douglas-fir (red fir) | x | x | x | x | x | | | | | | x |
| Engelmann spruce | x | x | x | x | x | | | | | | x |
| Grand fir (white fir) | x | | | | | | | | | | |
| Juniper | x | x | x | | | x | | | x | x | x |
| Lodgepole pine | x | x | x | x | x | | | | | | x |
| Ponderosa pine | x | x | | | | | | | | | |
| Subalpine fir | x | x | | | x | | | | | | |
| Willow | x | x | x | x | x | x | x | x | x | x | x |

Table 3. Types of wood available by county, southwestern Idaho.

| | Adams | Valley | Washington | Payette | Gem | Boise | Canyon | Ada | Elmore | Owyhee |
|-----------------------|-------|--------|------------|---------|-----|-------|--------|-----|--------|--------|
| Aspen | x | x | x | | x | x | | | x | x |
| Cottonwood | x | x | x | x | x | x | x | x | x | x |
| Douglas-fir (red fir) | x | x | x | | x | x | | | x | x |
| Engelmann spruce | x | x | x | | | x | | | x | x |
| Grand fir (white fir) | x | x | | | | x | | | | |
| Juniper | | | | x | | | | | x | x |
| Limber pine | x | | | | | | | | | x |
| Lodgepole pine | x | x | x | | | x | | | x | |
| Ponderosa pine | x | x | x | | | x | | | x | |
| Subalpine fir | x | x | x | | x | x | | | x | |
| Larch (tamarack) | x | x | | | x | | | | | |
| Willow | x | x | x | x | x | x | x | x | x | x |

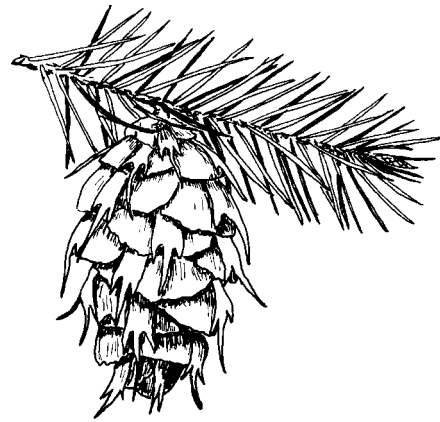


Table 4. Types of wood available by county, eastern Idaho.

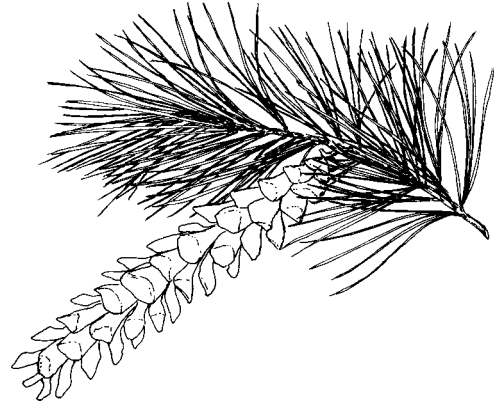
| | Clark | Fremont | Jefferson | Madison | Teton | Bingham | Bonneville | Power | Bannock | Caribou | Oneida | Franklin | Bear Lake |
|-----------------------|-------|---------|-----------|---------|-------|---------|------------|-------|---------|---------|--------|----------|-----------|
| Aspen | x | x | | | | | | | | | | | |
| Cottonwood | | | | | x | | | | | | | | |
| Douglas-fir (red fir) | x | x | | x | x | x | x | x | x | x | x | x | x |
| Engelmann spruce | x | x | | x | | | | | | | | | |
| Juniper | x | x | x | x | | x | x | x | x | x | x | x | x |
| Limber pine | x | x | | | x | | x | x | x | x | | | x |
| Lodgepole pine | x | x | | | x | | x | | x | x | x | x | x |
| Subalpine fir | x | x | | | | | | x | x | x | x | x | x |
| Willow | x | x | x | x | x | x | x | x | x | x | x | x | x |



Table 5. Table for estimated cords-per-tree.*

| DBH** (inches) | Cords per tree | Number trees to make a cord |
|-------------------|-------------------|--------------------------------|
| 4 | 0.01 | 67 |
| 6 | 0.04 | 23 |
| 8 | 0.09 | 10.5 |
| 10 | 0.17 | 5.8 |
| 12 | 0.28 | 3.5 |
| 14 | 0.41 | 2.4 |
| 16 | 0.58 | 1.7 |
| 18 | 0.7 | 1.3 |
| 20 | 1.0 | 1.00 |
| 22 | 1.2 | 0.82 |
| 24 | 1.5 | 0.67 |
| 26 | 1.8 | 0.54 |
| 28 | 2.2 | 0.46 |
| 30 | 2.5 | 0.40 |

*Source: Burlison, V.H., and Everett Ellis. 1955. Fuel values of Idaho woods. Univ. of Idaho Ag. Ext. Serv. Bul. 228.
**Diameter outside bark at 4.5 feet above ground level.

**Table 6. Fuelwood characteristics.¹**

| Species | Heat ² | Weight ³ | Ease of splitting | Ease of starting | Coaling qualities | Sparks | Fragrance |
|-----------------------|-------------------|---------------------|-------------------|------------------|-------------------|----------|-----------|
| Alder | M-L | 2540 | easy | fair | good | moderate | slight |
| Apple | VH | 4400 | difficult | difficult | excellent | few | excellent |
| Ash | H | 3440 | easy-mod. | fair-diff. | good-exc. | few | slight |
| Aspen | L | 2160 | easy | easy | good | few | slight |
| Birch | M | 3040 | easy | easy | good | moderate | slight |
| Boxelder | M-H | 3200 | moderate | fair-diff. | excellent | many | fair |
| Cedar | M-L | 2060 | easy | easy | poor | many | slight |
| Cottonwood | L | 2160 | easy | easy | good | moderate | slight |
| Douglas-fir (red fir) | M | 2970 | easy | easy | fair | moderate | slight |
| Elm | M | 2260 | very difficult | fair | good | very few | fair |
| Grand (white fir) | L | 2160 | moderate | easy | poor | moderate | good |
| Hemlock | M-L | 2700 | easy | easy | poor | many | good |
| Juniper | M | 3150 | difficult | fair | good | many | good |
| Larch (tamarack) | M | 3330 | easy-mod. | easy | fair | many | slight |
| Locust | VH | 3840 | very difficult | difficult | excellent | very few | slight |
| Lodgepole pine | M-L | 2610 | easy | easy | fair | moderate | good |
| Ponderosa pine | M-L | 2240 | moderate | fair | fair | moderate | good |
| Poplar | L | 2080 | easy | easy | fair | moderate | bitter |
| Spruce | L | 2070 | easy | easy | poor | few | slight |
| White pine | M-L | 2250 | easy | easy | poor | moderate | good |
| Willow | L | 2540 | easy | fair | poor | moderate | slight |

¹Modified from Hansen, H.J. 1977. Fuelwood facts. Western Reg. Ag. Eng. Service Pub. 70, Oregon State Univ., Corvallis.

²VH - very high; H - high; M - medium; L - low.

³Approximate weight, lb/cord, for air-seasoned (20% moisture content) wood.