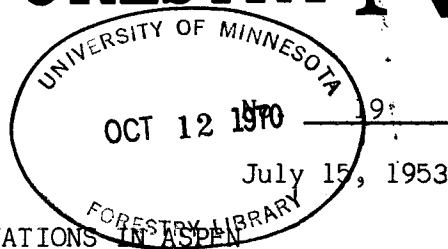


# MINNESOTA FORESTRY NOTES

COPY 2



## SEASONAL MOISTURE VARIATIONS IN ASPEN

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Recent investigations have shown that the wood moisture content of one common Minnesota tree species (*Populus tremuloides* Michx.) undergoes large seasonal variations. These studies have shown that for this species the period of high moisture content occurs during the fall and winter, rather than during the spring and summer.

The seasonal nature and extent of aspen wood moisture content were determined from two studies conducted by the authors. Since May of 1951 seasonal moisture fluctuations have been investigated in a 37-year-old stand of aspen on the Cloquet Experimental Forest. The moisture content of trees was determined from one-inch-thick disks taken in cross-section at 100-inch intervals beginning at the stump. Ten trees were cut at monthly intervals in the 1951-1952 period and at 28-day intervals in the 1952-1953 period. Resulting moisture content data are presented in Table 1.

Table 1. Seasonal variation in the moisture content\* of aspen, Cloquet Experimental Forest.

1951-1952		1952-1953		1953-1953	
Date	M.C.	Date	M.C.	Date	M.C.
May 14, 1951	93.7	June 6, 1952	72.1	May 7, 1953	103.2
June 14, 1951	84.1	July 3, 1953	73.4	June 3, 1953	92.2
July 16, 1951	84.5	July 30, 1952	73.4		
Aug. 14, 1951	90.2	Aug. 29, 1952	76.5		
Sept. 13, 1951	84.0	Sept. 24, 1952	73.7		
Oct. 12, 1951	88.3	Oct. 22, 1952	83.7		
Nov. 15, 1951	107.0	Nov. 24, 1952	106.8		
Dec. 14, 1951	109.2	Dec. 17, 1952	109.5		
Jan. 17, 1952	114.6	Jan. 13, 1953	106.6		
Feb. 14, 1952	108.6	Feb. 10, 1953	107.5		
Mar. 25, 1952	114.9	Mar. 10, 1953	109.4		
Apr. 15, 1952	104.9	Apr. 13, 1953	101.8		

\*Moisture content (M.C.) expressed as a percentage of oven-dry weight of both wood and bark.

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As is evident in Table 1, moisture contents from June through September were found to be consistently low and those from November through April consistently high, with the months of May and October apparently the transitional periods. Statistical analysis revealed significance at the one per cent level between the seasonal averages for both years.

While this study demonstrated the variation in one locality, the extent of variation from place to place was still unknown. Therefore, a further study was made by sampling aspen in various locations throughout the northern portion of Minnesota. The trees on eleven plots were cut during the period August 6-27, 1952. Ten trees were cut at each location, with disks being cut and their moisture content determined in the same manner as in the above study. Moisture content samples were again taken on five of the more accessible plots between December 29, 1952, and January 1, 1953. Results of these two sampling periods are set forth in Table 2.

Table 2. Variations in the moisture content of aspen by season of year for various locations in Minnesota.

Location	Moisture Content*	
	Summer	Winter
Walker	91.6	--
Cloquet	84.8	118.3
Cut-foot Sioux	83.6	118.6
Cook	80.1	--
International Falls	79.4	--
Pequot Lakes	78.2	--
Baudette	77.4	105.0
Hill City	77.3	112.2
Avoy	76.2	112.5
Hinckley	71.4	--
Park Rapids	71.3	--
Average (all areas)	79.2	
Average (for five locations sampled in winter as well as summer)	79.9	113.3

\*Expressed as a percentage of oven-dry weight of both wood and bark.

The most significant conclusion to be drawn from Table 2 data is that the degree of difference between the average summer and winter wood moisture content of the aspen trees sampled in five widely separated areas in northern Minnesota is consistent and substantial.