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Preliminary tables of some chemical elements in seven tree species in Maine

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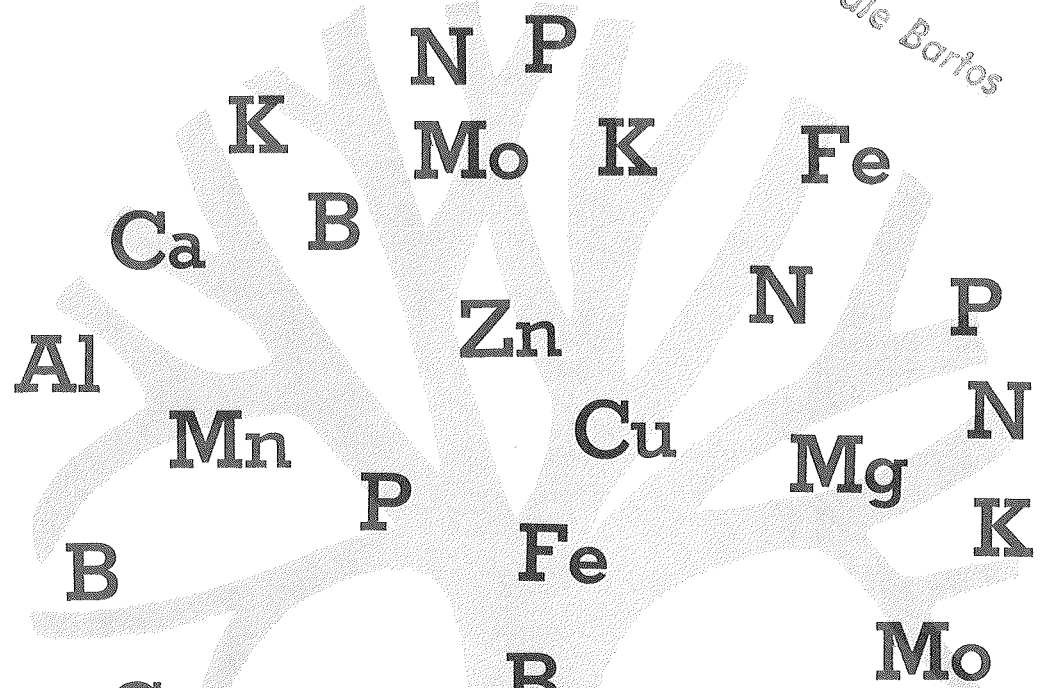
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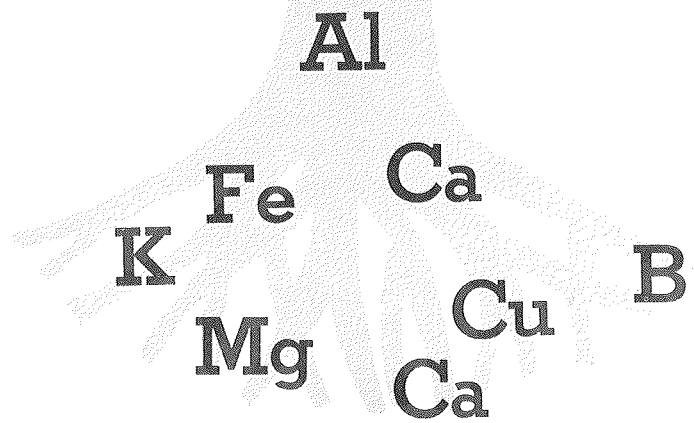
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PRELIMINARY TABLES OF SOME CHEMICAL ELEMENTS

IN SEVEN TREE SPECIES IN MAINE

Harold E. Young
 Paul N. Carpenter
 Russell A. Altenberger



MAINE AGRICULTURAL EXPERIMENT STATION

Acknowledgments

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PRELIMINARY TABLES OF SOME CHEMICAL ELEMENTS IN SEVEN TREE SPECIES IN MAINE

Harold E. Young¹, Paul N. Carpenter² and Russell A. Altenberger³

INFORMATION FOR PROPER USE OF THE TABLES

A series of studies of the fresh and dry weight of complete trees by components, led to the development of the complete tree concept. In this concept the primary unit of measurement is weight instead of volume as it is based on the woody fiber. The entire tree from root hairs to needles or leaves is considered for biological and technological research and development leading to eventual utilization of the complete tree.

The first of a series of studies based on the complete tree concept was concerned with the chemical elements in the wood and bark of tree components and in the leaves or needles. This study was published by the Technical Association of Pulp and Paper Industries. The findings by the TAPPI study coupled with the information supplied by the preliminary fresh and dry weight tables for these same species, published by the Maine Agricultural Experiment Station, formed the basis of the tables that make up this current study.

These tables show the amount in grams for each of twelve elements for the complete tree and the merchantable bole, for seven tree species in terms of five height classes and ten diameter classes.

Tables 1 and 2 show the percent of each of the elements in the bark of the complete tree and in the bark of the merchantable bole by species. These have been included to show the relative amount removed from the forest when the bark is included. Table 3 shows the percent of each element in the leaves or needles, and in the roots and branches less than $\frac{1}{4}$ inch in diameter for each element by species. Under the most intensive utilization of a tree this material is the most likely of all the components to be returned to the forest floor for the next crop. Table 4 shows the percent of each element in the wood portion of the complete tree larger than $\frac{1}{4}$ inch in diameter to illustrate the removal of chemical elements under intensive utilization.

The authors are acutely aware of the importance of adequate sampling to determine the range of variation of chemical elements between trees growing on the same site and between sites. Six or more

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mature trees per site and three to six sites would have been desirable. This study was limited to a single tree for each species growing in till soil for the chemical elements analysis. We recognize this as inadequate sampling and therefore refer to these tables as *preliminary* tables.

To obtain and chemically analyze 21 sets of duplicate samples for 12 elements for a single tree from each of seven species constitutes a formidable work load. Inasmuch as each tree had lived for a lengthy period of years, each subsample was a composite of many years' growth of a single tree. Extensive sampling is desirable and necessary to determine the range of variation that can be expected for each element in each species from small seedlings to mature trees. Such studies are underway and will be reported at a later date.

These tables do show the general order of magnitude for each of the 12 elements by species. Because of the limited sampling, the results have been rounded off to the nearest gram for those in comparative abundance and to the nearest tenth of a gram for those present in small amounts. It is important to bear in mind that the actual amount of an element present in a tree is not, by itself, a true indication of the relative importance of that element for the survival and growth of that tree.

At this point our knowledge of the supply of chemical elements in forest soils, the demand of forest vegetation and the amounts of chemical elements removed in harvesting operations is very limited. It is hoped that these preliminary tables will stimulate professional foresters and forest scientists in such a manner that these tables will be used for exploratory studies. Our rapidly expanding national population will necessitate more exact information in order to meet our national requirements for forest products in the future.

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Table 1—Estimated Amount of Element in Bark as Percent of Amount of Element in Complete Tree*

Species	Elements											
	Al	Mn	Mo	Ca	P	Mg	Zn	Cu	Fe	B	N	K
Red Spruce	48	25	39	40	17	24	35	20	28	25	14	25
Balsam Fir	28	23	34	34	30	25	30	13	45	31	14	30
Hemlock	34	25	50	42	18	19	37	21	34	21	14	16
White Pine	74	43	55	63	46	44	49	22	57	57	21	39
White Birch	25	45	55	59	23	23	36	14	43	40	32	17
Red Maple	59	49	70	64	34	30	30	24	40	46	38	25
Aspen	59	39	69	67	41	43	55	28	53	53	34	40

*This table does not include bark in material in the tree smaller than ¼"—however such material is included in estimates of the complete tree

Table 2—Estimated Amount of Element in Bark as Percent of Amount of Element in Wood and Bark of Merchantable Bole (from stump to 4" top diameter inclusive)

Species	Elements											
	Al	Mn	Mo	Ca	P	Mg	Zn	Cu	Fe	B	N	K
Red Spruce	100	37	38	46	53	51	47	21	44	67	27	49
Balsam Fir	100	51	66	59	100	32	47	93	70	56	43	42
Hemlock	100	47	77	66	48	41	55	24	64	66	41	36
White Pine	100	60	65	82	100	66	57	19	61	73	37	53
White Birch	19	58	63	69	30	30	38	20	49	69	50	39
Red Maple	62	59	78	70	76	36	29	26	43	63	47	31
Aspen	100	52	82	75	48	44	61	25	55	65	47	37

Table 3—Estimated Amount of Element in the Leaves, Branches and Roots Less than ¼" as a Percent of Amount of Element in Complete Tree

Species	Elements											
	Al	Mn	Mo	Ca	P	Mg	Zn	Cu	Fe	B	N	K
Red Spruce	51	43	28	36	73	49	20	17	49	63	60	54
Balsam Fir	72	61	55	54	70	47	44	18	53	53	73	46
Hemlock	65	52	37	39	70	62	40	20	55	71	69	61
White Pine	25	29	17	22	50	33	16	7	22	24	46	30
White Birch	18	28	21	23	37	37	21	41	34	48	42	60
Red Maple	25	21	16	16	44	22	10	10	33	32	30	24
Aspen	33	32	18	16	31	17	15	8	19	25	39	6

Table 4—Estimated Amount of Element in Wood as a Percent of Amount of Element in Complete Tree

Species	Elements											
	Al	Mn	Mo	Ca	P	Mg	Zn	Cu	Fe	B	N	K
Red Spruce	1	32	33	24	10	27	45	63	23	12	26	21
Balsam Fir	0	16	11	12	—	28	26	69	2	16	13	24
Hemlock	1	23	13	19	12	19	23	59	11	8	17	23
White Pine	1	28	28	15	4	23	35	71	21	19	33	31
White Birch	57	27	24	18	40	40	43	45	23	12	26	23
Red Maple	16	30	14	20	22	48	60	66	27	22	32	51
Aspen	8	29	13	17	28	40	30	64	28	22	27	54

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	288.	311.			
7	406.	438.			
8	546.	589.	626.		
9	709.	765.	814.	858.	
10			1029.	1084.	1134.
11			1272.	1340.	1402.
12			1543.	1626.	1701.
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	82.	102.			
7	112.	139.			
8	147.	182.	217.		
9	186.	231.	275.	319.	
10			341.	395.	450.
11			413.	479.	545.
12			492.	571.	650.
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	289.	311.			
7	407.	439.			
8	547.	590.	628.		
9	711.	767.	816.	860.	
10			1031.	1087.	1137.
11			1275.	1343.	1405.
12			1547.	1630.	1705.
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	105.	130.			
7	143.	178.			
8	188.	233.	278.		
9	238.	296.	353.	410.	
10			437.	507.	577.
11			530.	615.	699.
12			631.	733.	834.
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	109.	117.			
7	153.	165.			
8	206.	223.	237.		
9	268.	289.	308.	324.	
10			389.	410.	429.
11			481.	507.	530.
12			584.	615.	643.
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	19.	24.			
7	26.	32.			
8	34.	42.	50.		
9	43.	54.	64.	74.	
10			79.	92.	104.
11			96.	111.	127.
12			114.	133.	151.
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	36.	38.			
7	50.	54.			
8	68.	73.	78.		
9	88.	95.	101.	106.	
10			127.	134.	140.
11			157.	166.	173.
12			191.	201.	210.
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	11.	14.			
7	15.	19.			
8	20.	25.	30.		
9	25.	31.	38.	44.	
10			46.	54.	61.
11			56.	65.	74.
12			67.	78.	89.
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	32.	34.			
7	44.	48.			
8	60.	65.	69.		
9	78.	84.	89.	94.	
10			113.	119.	124.
11			139.	147.	154.
12			169.	178.	186.
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	9.	12.			
7	13.	16.			
8	17.	21.	25.		
9	21.	26.	31.	36.	
10			39.	45.	51.
11			47.	55.	62.
12			56.	65.	74.
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	9.	10.			
7	13.	14.			
8	17.	19.	20.		
9	23.	25.	26.	27.	
10			33.	35.	36.
11			41.	43.	45.
12			49.	52.	55.
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	4.	4.			
7	5.	6.			
8	6.	8.	9.		
9	8.	10.	12.	14.	
10			15.	17.	20.
11			18.	21.	24.
12			21.	25.	28.
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.4	3.7			
7	4.8	5.2			
8	6.4	6.9	7.4		
9	8.4	9.0	9.6	10.1	
10			12.1	12.8	13.4
11			15.0	15.8	16.5
12			18.2	19.2	20.1
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.9	1.1			
7	1.2	1.5			
8	1.5	1.9	2.3		
9	1.9	2.4	2.9	3.3	
10			3.6	4.1	4.7
11			4.3	5.0	5.7
12			5.2	6.0	6.8
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	2.7	2.9			
7	3.7	4.0			
8	5.0	5.4	5.8		
9	6.5	7.1	7.5	7.9	
10			9.5	10.0	10.5
11			11.7	12.4	12.9
12			14.2	15.0	15.7
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.2	1.5			
7	1.7	2.1			
8	2.2	2.7	3.3		
9	2.8	3.5	4.1	4.8	
10			5.1	5.9	6.7
11			6.2	7.2	8.2
12			7.4	8.6	9.7
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.2			
7	.3	.3			
8	.4	.4	.4		
9	.5	.5	.5	.6	
10			.7	.7	.7
11			.8	.9	.9
12			1.0	1.1	1.1
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.1	.1			
8	.1	.2	.2		
9	.2	.2	.2	.3	
10			.3	.3	.4
11			.4	.4	.5
12			.4	.5	.6
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	4.6	5.0			
7	6.5	7.0			
8	8.7	9.4	10.0		
9	11.4	12.3	13.0	13.7	
10			16.5	17.4	18.2
11			20.4	21.5	22.5
12			24.7	26.0	27.3
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLF

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	2.0	2.4			
7	2.7	3.3			
8	3.5	4.4	5.2		
9	4.5	5.5	6.6	7.7	
10			8.2	9.5	10.8
11			9.9	11.5	13.1
12			11.8	13.7	15.6
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.8	.9			
7	1.1	1.2			
8	1.5	1.6	1.7		
9	2.0	2.1	2.3	2.4	
10			2.8	3.0	3.1
11			3.5	3.7	3.9
12			4.3	4.5	4.7
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.3			
7	.3	.4			
8	.4	.5	.6		
9	.5	.6	.8	.9	
10			.9	1.1	1.2
11			1.1	1.3	1.5
12			1.4	1.6	1.8
13					
14					
15					

WHITE BIRCH
COMPLETE TREE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.6	.6			
7	.8	.8			
8	1.0	1.1	1.2		
9	1.4	1.5	1.6	1.6	
10			2.0	2.1	2.2
11			2.4	2.6	2.7
12			3.0	3.1	3.3
13					
14					
15					

WHITE BIRCH
MERCHANTABLE BOLE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.2			
7	.2	.2			
8	.3	.3	.4		
9	.3	.4	.5	.6	
10			.6	.7	.8
11			.7	.8	1.0
12			.9	1.0	1.1
13					
14					
15					

RED SPRUCE

COMPLETE TREE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	159.	171.			
7	224.	241.	257.		
8	301.	325.	345.		
9		422.	449.		
10		533.	567.	597.	
11		659.	701.	738.	
12		799.	850.	896.	
13			1016.	1071.	
14			1198.	1262.	
15			1397.	1472.	

RED SPRUCE

MERCHANTABLE BOLE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	32.	40.			
7	44.	54.	64.		
8	57.	71.	84.		
9		90.	107.		
10		111.	133.	154.	
11		135.	161.	187.	
12		161.	192.	222.	
13			225.	261.	
14			262.	304.	
15			301.	349.	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	241.	260.			
7	339.	366.	389.		
8	456.	492.	524.		
9		639.	680.		
10		808.	860.	906.	
11		999.	1063.	1120.	
12		1212.	1290.	1359.	
13			1541.	1623.	
14			1817.	1914.	
15			2118.	2232.	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	60.	75.			
7	82.	102.	122.		
8	108.	134.	160.		
9		170.	203.		
10		210.	251.	291.	
11		255.	304.	353.	
12		304.	363.	421.	
13			426.	495.	
14			495.	575.	
15			570.	661.	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	74.	80.			
7	105.	113.	120.		
8	141.	152.	162.		
9		198.	211.		
10		250.	266.	280.	
11		309.	329.	347.	
12		375.	399.	421.	
13			477.	502.	
14			562.	592.	
15			655.	691.	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	16.	19.			
7	21.	27.	32.		
8	28.	35.	41.		
9		44.	53.		
10		55.	65.	76.	
11		66.	79.	92.	
12		79.	94.	109.	
13			111.	128.	
14			128.	149.	
15			148.	171.	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	27.	29.			
7	38.	41.	43.		
8	51.	55.	58.		
9		71.	76.		
10		90.	96.	101.	
11		111.	118.	125.	
12		135.	144.	151.	
13			172.	181.	
14			202.	213.	
15			236.	249.	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	6.	7.			
7	8.	10.	11.		
8	10.	12.	15.		
9		16.	19.		
10		20.	23.	27.	
11		24.	28.	33.	
12		28.	34.	39.	
13			40.	46.	
14			46.	53.	
15			53.	61.	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	32.	34.			
7	45.	48.	51.		
8	60.	65.	69.		
9		85.	90.		
10		107.	114.	120.	
11		132.	141.	148.	
12		160.	171.	180.	
13			204.	215.	
14			240.	253.	
15			280.	295.	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	4.	5.			
7	6.	7.	9.		
8	8.	9.	11.		
9		12.	14.		
10		15.	18.	20.	
11		18.	21.	25.	
12		21.	25.	29.	
13			30.	35.	
14			35.	40.	
15			40.	46.	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	31.	34.			
7	44.	47.	50.		
8	59.	64.	68.		
9		83.	88.		
10		104.	111.	117.	
11		129.	137.	145.	
12		157.	167.	176.	
13			199.	210.	
14			235.	247.	
15			274.	288.	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	9.	11.			
7	12.	15.	18.		
8	16.	20.	24.		
9		25.	30.		
10		31.	37.	43.	
11		38.	45.	52.	
12		45.	54.	63.	
13			63.	74.	
14			74.	85.	
15			85.	98.	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.9	4.2			
7	5.5	5.9	6.3		
8	7.4	8.0	8.5		
9		10.4	11.0		
10		13.1	13.9	14.7	
11		16.2	17.2	18.1	
12		19.6	20.9	22.0	
13			24.9	26.3	
14			29.4	31.0	
15			34.3	36.1	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.0	1.2			
7	1.4	1.7	2.0		
8	1.8	2.2	2.6		
9		2.8	3.3		
10		3.4	4.1	4.8	
11		4.2	5.0	5.8	
12		5.0	5.9	6.9	
13			7.0	8.1	
14			8.1	9.4	
15			9.3	10.8	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	2.0	2.2			
7	2.8	3.1	3.3		
8	3.8	4.1	4.4		
9		5.4	5.7		
10		6.8	7.2	7.6	
11		8.4	8.9	9.4	
12		10.2	10.8	11.4	
13			12.9	13.6	
14			15.2	16.0	
15			17.7	18.7	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.3	.3			
7	.4	.4	.5		
8	.5	.6	.7		
9		.7	.9		
10		.9	1.1	1.3	
11		1.1	1.3	1.5	
12		1.3	1.6	1.8	
13			1.8	2.1	
14			2.1	2.5	
15			2.5	2.9	

RED SPRUCE

COMPLETE TREE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.2			
7	.2	.3	.3		
8	.3	.3	.4		
9		.5	.5		
10		.6	.6	.6	
11		.7	.8	.8	
12		.9	.9	1.0	
13			1.1	1.2	
14			1.3	1.4	
15			1.5	1.6	

RED SPRUCE

MERCHANTABLE BOLE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.1	.1	.1		
8	.1	.1	.1		
9		.2	.2		
10		.2	.2	.3	
11		.2	.3	.3	
12		.3	.3	.4	
13			.4	.5	
14			.5	.5	
15			.5	.6	

RED SPRUCE

COMPLETE TREE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.9	2.0			
7	2.6	2.9	3.0		
8	3.6	3.8	4.1		
9		5.0	5.3		
10		6.3	6.7	7.1	
11		7.8	8.3	8.7	
12		9.5	10.1	10.6	
13			12.0	12.7	
14			14.2	14.9	
15			16.5	17.4	

RED SPRUCE

MERCHANTABLE BOLE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.6	.7			
7	.8	1.0	1.2		
8	1.0	1.3	1.5		
9		1.6	1.9		
10		2.0	2.4	2.8	
11		2.4	2.9	3.3	
12		2.9	3.4	4.0	
13			4.0	4.7	
14			4.7	5.4	
15			5.4	6.2	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.5			
7	.7	.8	.8		
8	.9	1.0	1.1		
9		1.3	1.4		
10		1.7	1.8	1.9	
11		2.1	2.2	2.3	
12		2.5	2.7	2.8	
13			3.2	3.3	
14			3.7	3.9	
15			4.4	4.6	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.3			
7	.3	.3	.4		
8	.4	.5	.5		
9		.6	.7		
10		.7	.9	1.0	
11		.9	1.0	1.2	
12		1.0	1.2	1.4	
13			1.5	1.7	
14			1.7	2.0	
15			1.9	2.3	

RED SPRUCE
COMPLETE TREE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.5			
7	.7	.8	.8		
8	.9	1.0	1.1		
9		1.3	1.4		
10		1.7	1.8	1.9	
11		2.1	2.2	2.3	
12		2.5	2.7	2.8	
13			3.2	3.3	
14			3.7	3.9	
15			4.4	4.6	

RED SPRUCE
MERCHANTABLE BOLE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.1	.1	.2		
8	.2	.2	.2		
9		.2	.3		
10		.3	.4	.4	
11		.4	.4	.5	
12		.4	.5	.6	
13			.6	.7	
14			.7	.8	
15			.8	1.0	

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	213.	230.			
7	301.	324.	345.		
8	404.	436.	464.		
9		567.	603.		
10		716.	762.	803.	
11		886.	942.	993.	
12		1075.	1143.	1204.	
13			1366.	1439.	
14			1610.	1697.	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	34.	42.			
7	47.	58.	69.		
8	61.	76.	90.		
9		96.	114.		
10		119.	142.	164.	
11		144.	172.	199.	
12		172.	205.	238.	
13			241.	279.	
14			280.	324.	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	214.	230.			
7	301.	325.	345.		
8	405.	437.	465.		
9		568.	604.		
10		718.	763.	804.	
11		887.	943.	994.	
12		1076.	1145.	1206.	
13			1368.	1441.	
14			1613.	1699.	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	50.	62.			
7	68.	85.	101.		
8	90.	111.	133.		
9		141.	168.		
10		175.	208.	242.	
11		212.	252.	293.	
12		252.	301.	349.	
13			354.	411.	
14			411.	477.	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	96.	104.			
7	135.	146.	155.		
8	182.	196.	209.		
9		255.	271.		
10		322.	343.	361.	
11		398.	424.	447.	
12		484.	514.	542.	
13			615.	648.	
14			725.	764.	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	33.	41.			
7	45.	56.	67.		
8	59.	74.	88.		
9		93.	111.		
10		115.	138.	160.	
11		140.	167.	194.	
12		167.	199.	231.	
13			234.	272.	
14			272.	316.	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	28.	30.			
7	39.	42.	45.		
8	52.	57.	60.		
9		74.	78.		
10		93.	99.	104.	
11		115.	122.	129.	
12		139.	148.	156.	
13			177.	187.	
14			209.	220.	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	10.	12.			
7	14.	17.	20.		
8	18.	22.	26.		
9		28.	33.		
10		35.	41.	48.	
11		42.	50.	58.	
12		50.	60.	69.	
13			70.	81.	
14			81.	94.	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	30.	32.			
7	42.	45.	48.		
8	56.	61.	65.		
9		79.	84.		
10		100.	106.	112.	
11		124.	132.	139.	
12		150.	160.	168.	
13			191.	201.	
14			225.	237.	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	4.	4.			
7	5.	6.	7.		
8	6.	8.	10.		
9		10.	12.		
10		13.	15.	17.	
11		15.	18.	21.	
12		18.	22.	25.	
13			25.	30.	
14			30.	34.	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	27.	29.			
7	38.	41.	44.		
8	52.	56.	59.		
9		72.	77.		
10		91.	97.	102.	
11		113.	120.	127.	
12		137.	146.	154.	
13			174.	184.	
14			205.	216.	
15					

BALSAM FIR
MERCHANTABLE BOLF

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	6.	8.			
7	9.	11.	13.		
8	11.	14.	17.		
9		18.	22.		
10		22.	27.	31.	
11		27.	32.	38.	
12		32.	39.	45.	
13			45.	53.	
14			53.	61.	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.8	4.1			
7	5.4	5.8	6.2		
8	7.3	7.9	8.4		
9		10.2	10.9		
10		12.9	13.7	14.5	
11		16.0	17.0	17.9	
12		19.4	20.6	21.7	
13			24.6	25.9	
14			29.0	30.6	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.1	1.3			
7	1.4	1.8	2.1		
8	1.9	2.4	2.8		
9		3.0	3.6		
10		3.7	4.4	5.1	
11		4.5	5.3	6.2	
12		5.3	6.4	7.4	
13			7.5	8.7	
14			8.7	10.1	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	4.7	5.0			
7	6.6	7.1	7.5		
8	8.8	9.5	10.1		
9		12.4	13.2		
10		15.6	16.6	17.5	
11		19.3	20.6	21.7	
12		23.5	25.0	26.3	
13			29.8	31.4	
14			35.2	37.0	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.6			
7	.7	.8	1.0		
8	.9	1.1	1.3		
9		1.4	1.7		
10		1.7	2.1	2.4	
11		2.1	2.5	2.9	
12		2.5	3.0	3.5	
13			3.5	4.1	
14			4.1	4.8	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.2	.2	.2		
8	.3	.3	.3		
9		.4	.4		
10		.5	.5	.5	
11		.6	.6	.6	
12		.7	.7	.8	
13			.9	.9	
14			1.0	1.1	
15					

BALSAM FIR
MERCHANTABLE BOLF

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.0	.0			
7	.0	.1	.1		
8	.1	.1	.1		
9		.1	.1		
10		.1	.1	.1	
11		.1	.2	.2	
12		.2	.2	.2	
13			.2	.2	
14			.2	.3	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.9	2.0			
7	2.6	2.8	3.0		
8	3.5	3.8	4.0		
9		4.9	5.2		
10		6.2	6.6	7.0	
11		7.7	8.2	8.6	
12		9.3	9.9	10.5	
13			11.9	12.5	
14			14.0	14.7	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.6			
7	.7	.9	1.0		
8	.9	1.1	1.4		
9		1.5	1.7		
10		1.8	2.1	2.5	
11		2.2	2.6	3.0	
12		2.6	3.1	3.6	
13			3.6	4.2	
14			4.2	4.9	
15					

BALSAM FIR

COMPLETE TREE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.7	.7			
7	.9	1.0	1.1		
8	1.3	1.4	1.5		
9		1.8	1.9		
10		2.3	2.4	2.5	
11		2.8	3.0	3.1	
12		3.4	3.6	3.8	
13			4.3	4.5	
14			5.1	5.4	
15					

BALSAM FIR

MERCHANTABLE BOLE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.6			
7	.6	.8	1.0		
8	.8	1.0	1.2		
9		1.3	1.6		
10		1.6	2.0	2.3	
11		2.0	2.4	2.8	
12		2.4	2.8	3.3	
13			3.3	3.9	
14			3.9	4.5	
15					

BALSAM FIR
COMPLETE TREE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.4	.5			
7	.6	.7	.7		
8	.8	.9	.9		
9		1.1	1.2		
10		1.4	1.5	1.6	
11		1.8	1.9	2.0	
12		2.2	2.3	2.4	
13			2.7	2.9	
14			3.2	3.4	
15					

BALSAM FIR
MERCHANTABLE BOLE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.2	.2	.2		
8	.2	.2	.3		
9		.3	.4		
10		.4	.5	.5	
11		.5	.6	.7	
12		.6	.7	.8	
13			.8	.9	
14			.9	1.1	
15					

HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	196.	211.			
7	276.	298.			
8	371.	401.			
9	483.	521.			
10		658.	700.		
11		813.	865.		
12		987.	1050.		
13		1179.	1254.		
14		1390.	1479.		
15		1621.	1724.		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	32.	40.			
7	44.	55.			
8	58.	72.			
9	74.	91.			
10		113.	135.		
11		137.	164.		
12		164.	195.		
13		192.	229.		
14		223.	266.		
15		257.	306.		

HEMLOCK
COMPLETE TREE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	198.	213.			
7	279.	300.			
8	375.	404.			
9	487.	525.			
10		664.	706.		
11		821.	873.		
12		996.	1059.		
13		1190.	1266.		
14		1403.	1492.		
15		1636.	1740.		

HEMLOCK
MERCHANTABLE BOLE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	65.	81.			
7	89.	110.			
8	116.	144.			
9	147.	183.			
10		226.	270.		
11		275.	328.		
12		327.	390.		
13		385.	459.		
14		447.	533.		
15		514.	613.		

HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	83.	89.			
7	117.	126.			
8	157.	169.			
9	204.	220.			
10		278.	296.		
11		343.	365.		
12		417.	443.		
13		498.	530.		
14		587.	625.		
15		684.	728.		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	19.	23.			
7	26.	32.			
8	34.	42.			
9	43.	53.			
10		65.	78.		
11		79.	95.		
12		95.	113.		
13		111.	133.		
14		129.	154.		
15		148.	177.		

HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	25.	27.			
7	35.	38.			
8	48.	51.			
9	62.	67.			
10		84.	90.		
11		104.	111.		
12		127.	135.		
13		151.	161.		
14		178.	190.		
15		208.	221.		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	6.	7.			
7	8.	9.			
8	10.	12.			
9	13.	16.			
10		19.	23.		
11		24.	28.		
12		28.	33.		
13		33.	39.		
14		38.	46.		
15		44.	53.		

HEMLOCK
COMPLETE TREE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	38.	41.			
7	53.	57.			
8	71.	77.			
9	93.	100.			
10		127.	135.		
11		156.	166.		
12		190.	202.		
13		227.	241.		
14		268.	285.		
15		312.	332.		

HEMLOCK
MERCHANTABLE BOLE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	7.	9.			
7	9.	12.			
8	12.	15.			
9	16.	19.			
10		24.	29.		
11		29.	35.		
12		35.	41.		
13		41.	49.		
14		47.	56.		
15		54.	65.		

HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	29.	32.			
7	41.	45.			
8	56.	60.			
9	72.	78.			
10		99.	105.		
11		122.	130.		
12		148.	158.		
13		177.	188.		
14		209.	222.		
15		243.	259.		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	8.	10.			
7	11.	14.			
8	15.	18.			
9	18.	23.			
10		28.	34.		
11		34.	41.		
12		41.	49.		
13		48.	57.		
14		56.	67.		
15		64.	77.		

HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.5	3.8			
7	4.9	5.3			
8	6.6	7.1			
9	8.6	9.3			
10		11.7	12.5		
11		14.5	15.4		
12		17.6	18.7		
13		21.0	22.3		
14		24.8	26.4		
15		28.9	30.7		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.6			
7	.7	.8			
8	.9	1.1			
9	1.1	1.4			
10		1.7	2.0		
11		2.1	2.5		
12		2.5	2.9		
13		2.9	3.5		
14		3.4	4.0		
15		3.9	4.6		

HEMLOCK
COMPLETE TREE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.8	4.1			
7	5.4	5.8			
8	7.3	7.9			
9	9.5	10.2			
10		12.9	13.7		
11		15.9	17.0		
12		19.4	20.6		
13		23.1	24.6		
14		27.3	29.0		
15		31.8	33.8		

HEMLOCK
MERCHANTABLE BOLE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.6	.7			
7	.8	1.0			
8	1.1	1.3			
9	1.4	1.7			
10		2.1	2.5		
11		2.5	3.0		
12		3.0	3.6		
13		3.5	4.2		
14		4.1	4.9		
15		4.7	5.6		

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HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.1	.1			
8	.2	.2			
9	.2	.3			
10		.3	.3		
11		.4	.4		
12		.5	.5		
13		.6	.6		
14		.7	.7		
15		.8	.8		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.0	.0			
7	.0	.1			
8	.1	.1			
9	.1	.1			
10		.1	.1		
11		.1	.2		
12		.2	.2		
13		.2	.2		
14		.2	.3		
15		.2	.3		

HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.5			
7	.7	.7			
8	.9	1.0			
9	1.2	1.3			
10		1.6	1.7		
11		2.0	2.1		
12		2.4	2.6		
13		2.9	3.1		
14		3.4	3.6		
15		4.0	4.2		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.2			
7	.2	.2			
8	.2	.3			
9	.3	.4			
10		.5	.6		
11		.6	.7		
12		.7	.8		
13		.8	.9		
14		.9	1.1		
15		1.1	1.3		

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HEMLOCK

COMPLETE TREE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.4	.4			
7	.5	.6			
8	.7	.7			
9	.9	1.0			
10		1.2	1.3		
11		1.5	1.6		
12		1.8	2.0		
13		2.2	2.3		
14		2.6	2.8		
15		3.0	3.2		

HEMLOCK

MERCHANTABLE BOLE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.2			
7	.2	.3			
8	.3	.4			
9	.4	.5			
10		.6	.7		
11		.7	.9		
12		.9	1.0		
13		1.0	1.2		
14		1.2	1.4		
15		1.4	1.6		

HEMLOCK
COMPLETE TREE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.6	.7			
7	.9	.9			
8	1.2	1.3			
9	1.5	1.7			
10		2.1	2.2		
11		2.6	2.7		
12		3.1	3.3		
13		3.7	4.0		
14		4.4	4.7		
15		5.1	5.5		

HEMLOCK
MERCHANTABLE BOLE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.1	.1			
8	.2	.2			
9	.2	.2			
10		.3	.4		
11		.4	.4		
12		.4	.5		
13		.5	.6		
14		.6	.7		
15		.7	.8		

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	146.	157.			
7	206.	222.	236.		
8		299.	318.		
9		388.	413.	435.	
10		490.	522.	550.	
11			645.	679.	711.
12			782.	824.	862.
13				985.	1030.
14				1161.	1215.
15				1354.	1416.

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	43.	53.			
7	58.	72.	86.		
8		95.	113.		
9		120.	143.	166.	
10		149.	177.	206.	
11			215.	249.	284.
12			256.	297.	338.
13				350.	398.
14				406.	462.
15				467.	531.

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	93.	100.			
7	131.	141.	150.		
8		190.	202.		
9		246.	262.	276.	
10		312.	331.	349.	
11			410.	432.	452.
12			497.	524.	548.
13				626.	655.
14				738.	772.
15				860.	900.

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	41.	51.			
7	56.	69.	82.		
8		91.	108.		
9		115.	137.	159.	
10		142.	170.	197.	
11			206.	239.	272.
12			245.	285.	324.
13				335.	381.
14				389.	442.
15				447.	509.

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	55.	60.			
7	78.	84.	89.		
8		113.	120.		
9		147.	156.	165.	
10		186.	198.	208.	
11			244.	257.	269.
12			296.	312.	327.
13				373.	390.
14				440.	460.
15				513.	537.

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	22.	27.			
7	30.	37.	44.		
8		48.	58.		
9		61.	73.	85.	
10		76.	91.	105.	
11			110.	128.	145.
12			131.	152.	173.
13				179.	203.
14				208.	236.
15				239.	272.

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	20.	21.			
7	28.	30.	32.		
8		41.	43.		
9		53.	56.	59.	
10		67.	71.	75.	
11			88.	93.	97.
12			107.	112.	118.
13				134.	141.
14				158.	166.
15				185.	193.

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	7.	9.			
7	10.	12.	14.		
8		16.	19.		
9		20.	24.	28.	
10		25.	30.	34.	
11			36.	42.	48.
12			43.	50.	57.
13				59.	67.
14				68.	77.
15				78.	89.

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	15.	16.			
7	21.	23.	24.		
8		31.	33.		
9		40.	43.	45.	
10		51.	54.	57.	
11			67.	70.	74.
12			81.	85.	89.
13				102.	107.
14				120.	126.
15				140.	147.

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.	4.			
7	5.	6.	7.		
8		8.	9.		
9		10.	11.	13.	
10		12.	14.	16.	
11			17.	20.	23.
12			20.	24.	27.
13				28.	32.
14				32.	37.
15				37.	42.

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	6.	6.			
7	8.	9.	10.		
8		12.	13.		
9		16.	17.	18.	
10		20.	21.	22.	
11			26.	27.	29.
12			32.	33.	35.
13				40.	42.
14				47.	49.
15				55.	57.

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	2.	3.			
7	3.	4.	5.		
8		5.	7.		
9		7.	8.	10.	
10		9.	10.	12.	
11			12.	14.	16.
12			15.	17.	20.
13				20.	23.
14				24.	27.
15				27.	31.

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	2.7	2.9			
7	3.8	4.1	4.4		
8		5.6	5.9		
9		7.2	7.7	8.1	
10		9.1	9.7	10.2	
11			12.0	12.6	13.2
12			14.5	15.3	16.0
13				18.3	19.2
14				21.6	22.6
15				25.2	26.3

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.9	1.1			
7	1.2	1.5	1.8		
8		2.0	2.4		
9		2.5	3.0	3.5	
10		3.1	3.7	4.3	
11			4.5	5.2	6.0
12			5.4	6.2	7.1
13				7.3	8.4
14				8.5	9.7
15				9.8	11.2

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.0	3.2			
7	4.2	4.5	4.8		
8		6.1	6.5		
9		7.9	8.4	8.9	
10		10.0	10.6	11.2	
11			13.1	13.9	14.5
12			16.0	16.8	17.6
13				20.1	21.0
14				23.7	24.8
15				27.6	28.9

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.1	1.4			
7	1.5	1.8	2.2		
8		2.4	2.9		
9		3.1	3.7	4.2	
10		3.8	4.5	5.3	
11			5.5	6.4	7.3
12			6.5	7.6	8.6
13				8.9	10.2
14				10.4	11.8
15				11.9	13.6

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.1	.1	.1		
8		.1	.1		
9		.2	.2	.2	
10		.2	.2	.2	
11			.3	.3	.3
12			.4	.4	.4
13				.4	.5
14				.5	.5
15				.6	.6

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.0	.0			
7	.0	.0	.1		
8		.1	.1		
9		.1	.1	.1	
10		.1	.1	.1	
11			.1	.2	.2
12			.2	.2	.2
13				.2	.2
14				.3	.3
15				.3	.3

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.8	1.9			
7	2.5	2.7	2.8		
8		3.6	3.8		
9		4.7	5.0	5.2	
10		5.9	6.3	6.6	
11			7.8	8.2	8.6
12			9.4	9.9	10.4
13				11.9	12.4
14				14.0	14.6
15				16.3	17.1

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.9	1.1			
7	1.2	1.5	1.8		
8		2.0	2.4		
9		2.6	3.1	3.6	
10		3.2	3.8	4.4	
11			4.6	5.3	6.1
12			5.5	6.4	7.3
13				7.5	8.5
14				8.7	9.9
15				10.0	11.4

WHITE PINE

COMPLETE TREE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.4	.5			
7	.6	.7	.7		
8		.9	1.0		
9		1.2	1.3	1.3	
10		1.5	1.6	1.7	
11			2.0	2.1	2.2
12			2.4	2.5	2.6
13				3.0	3.1
14				3.5	3.7
15				4.1	4.3

WHITE PINE

MERCHANTABLE BOLE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.3			
7	.3	.4	.5		
8		.5	.6		
9		.7	.8	.9	
10		.8	1.0	1.1	
11			1.2	1.4	1.6
12			1.4	1.7	1.9
13				1.9	2.2
14				2.3	2.6
15				2.6	3.0

WHITE PINE
COMPLETE TREE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.3	.3			
7	.4	.5	.5		
8		.6	.7		
9		.8	.9	.9	
10		1.0	1.1	1.2	
11			1.4	1.5	1.5
12			1.7	1.8	1.8
13				2.1	2.2
14				2.5	2.6
15				2.9	3.0

WHITE PINE
MERCHANTABLE BOLE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.2			
7	.2	.2	.3		
8		.3	.3		
9		.4	.4	.5	
10		.5	.5	.6	
11			.7	.8	.9
12			.8	.9	1.0
13				1.1	1.2
14				1.3	1.4
15				1.4	1.6

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	219.	236.			
7	308.	332.	353.		
8		447.	476.		
9		581.	618.	651.	
10			781.	823.	
11			965.	1017.	
12			1171.	1234.	
13			1400.	1475.	
14			1650.	1739.	
15			1924.	2027.	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	65.	81.			
7	89.	111.	132.		
8		145.	173.		
9		184.	220.	255.	
10			272.	316.	
11			330.	383.	
12			393.	456.	
13			462.	536.	
14			537.	623.	
15			617.	716.	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	328.	354.			
7	462.	498.	530.		
8		671.	713.		
9		871.	927.	977.	
10			1172.	1234.	
11			1448.	1526.	
12			1757.	1852.	
13			2100.	2212.	
14			2476.	2608.	
15			2886.	3041.	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	116.	145.			
7	159.	197.	235.		
8		259.	308.		
9		328.	391.	454.	
10			484.	562.	
11			587.	681.	
12			700.	812.	
13			823.	955.	
14			956.	1110.	
15			1099.	1276.	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	144.	155.			
7	202.	218.	232.		
8		294.	312.		
9		382.	406.	428.	
10			513.	541.	
11			634.	668.	
12			770.	811.	
13			919.	969.	
14			1084.	1142.	
15			1264.	1332.	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	42.	52.			
7	57.	71.	85.		
8		93.	111.		
9		118.	141.	163.	
10			174.	202.	
11			211.	245.	
12			252.	292.	
13			296.	344.	
14			344.	399.	
15			395.	459.	

RED MAPLE

COMPLETE TREE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	26.	28.			
7	36.	39.	41.		
8		52.	56.		
9		68.	72.	76.	
10			91.	96.	
11			113.	119.	
12			137.	145.	
13			164.	173.	
14			193.	204.	
15			225.	237.	

RED MAPLE

MERCHANTABLE BOLE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	8.	10.			
7	11.	13.	16.		
8		18.	21.		
9		22.	27.	31.	
10			33.	38.	
11			40.	47.	
12			48.	55.	
13			56.	65.	
14			65.	76.	
15			75.	87.	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	32.	35.			
7	46.	49.	52.		
8		66.	71.		
9		86.	92.	97.	
10			116.	122.	
11			143.	151.	
12			174.	183.	
13			208.	219.	
14			245.	258.	
15			286.	301.	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	5.	7.			
7	7.	9.	11.		
8		12.	14.		
9		15.	18.	21.	
10			22.	25.	
11			27.	31.	
12			32.	37.	
13			37.	43.	
14			43.	50.	
15			50.	58.	

RED MAPLE

COMPLETE TREE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	20.	22.			
7	28.	30.	32.		
8		41.	43.		
9		53.	57.	60.	
10			71.	75.	
11			88.	93.	
12			107.	113.	
13			128.	135.	
14			151.	159.	
15			176.	185.	

RED MAPLE

MERCHANTABLE BOLE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	7.	9.			
7	10.	12.	15.		
8		16.	19.		
9		21.	25.	29.	
10			31.	35.	
11			37.	43.	
12			44.	51.	
13			52.	60.	
14			60.	70.	
15			69.	80.	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.5	3.8			
7	4.9	5.3	5.6		
8		7.1	7.6		
9		9.3	9.9	10.4	
10			12.5	13.1	
11			15.4	16.2	
12			18.7	19.7	
13			22.4	23.6	
14			26.4	27.8	
15			30.7	32.4	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	IRON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.8	1.0			
7	1.1	1.4	1.7		
8		1.8	2.2		
9		2.3	2.8	3.2	
10			3.4	4.0	
11			4.1	4.8	
12			4.9	5.7	
13			5.8	6.7	
14			6.7	7.8	
15			7.7	9.0	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.9	1.0			
7	1.3	1.4	1.4		
8		1.8	1.9		
9		2.4	2.5	2.7	
10			3.2	3.4	
11			3.9	4.2	
12			4.8	5.0	
13			5.7	6.0	
14			6.7	7.1	
15			7.9	8.3	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.2			
7	.3	.3	.4		
8		.4	.5		
9		.5	.6	.7	
10			.8	.9	
11			1.0	1.1	
12			1.1	1.3	
13			1.3	1.6	
14			1.6	1.8	
15			1.8	2.1	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.2			
7	.2	.3	.3		
8		.3	.4		
9		.4	.5	.5	
10			.6	.6	
11			.7	.8	
12			.9	.9	
13			1.1	1.1	
14			1.2	1.3	
15			1.5	1.5	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.1	.1			
7	.1	.1	.1		
8		.1	.1		
9		.2	.2	.2	
10			.2	.3	
11			.3	.3	
12			.3	.4	
13			.4	.5	
14			.5	.5	
15			.5	.6	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	3.7	4.0			
7	5.2	5.6	5.9		
8		7.5	8.0		
9		9.8	10.4	10.9	
10			13.1	13.8	
11			16.2	17.1	
12			19.7	20.7	
13			23.5	24.8	
14			27.7	29.2	
15			32.3	34.1	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	1.7	2.1			
7	2.3	2.9	3.5		
8		3.8	4.6		
9		4.8	5.8	6.7	
10			7.1	8.3	
11			8.7	10.1	
12			10.3	12.0	
13			12.1	14.1	
14			14.1	16.4	
15			16.2	18.8	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.6	.7			
7	.9	1.0	1.0		
8		1.3	1.4		
9		1.7	1.8	1.9	
10			2.2	2.4	
11			2.8	2.9	
12			3.4	3.6	
13			4.0	4.2	
14			4.7	5.0	
15			5.5	5.8	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	COPPER (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.3	.3			
7	.4	.5	.6		
8		.6	.7		
9		.8	.9	1.1	
10			1.2	1.3	
11			1.4	1.6	
12			1.7	1.9	
13			2.0	2.3	
14			2.3	2.7	
15			2.6	3.1	

RED MAPLE
COMPLETE TREE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.5	.6			
7	.7	.8	.8		
8		1.0	1.1		
9		1.4	1.5	1.5	
10			1.8	1.9	
11			2.3	2.4	
12			2.7	2.9	
13			3.3	3.5	
14			3.9	4.1	
15			4.5	4.8	

RED MAPLE
MERCHANTABLE BOLE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6	.2	.2			
7	.2	.3	.3		
8		.3	.4		
9		.4	.5	.6	
10			.6	.7	
11			.8	.9	
12			.9	1.1	
13			1.1	1.2	
14			1.2	1.4	
15			1.4	1.7	

ASPEN
COMPLETE TREE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	40	TOTAL HEIGHT (FEET)			80
		50	60	70	
6		241.	256.		
7		339.	361.		
8		456.	485.		
9		593.	630.	664.	
10			797.	840.	
11			985.	1038.	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	NITROGEN (GRAMS)				
	40	TOTAL HEIGHT (FEET)			80
		50	60	70	
6		78.	92.		
7		106.	126.		
8		139.	165.		
9		176.	210.	244.	
10			260.	301.	
11			315.	365.	
12					
13					
14					
15					

ASPEN
COMPLETE TREE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		384.	408.		
7		540.	575.		
8		727.	774.		
9		945.	1005.	1059.	
10			1271.	1339.	
11			1570.	1655.	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	CALCIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		178.	213.		
7		244.	291.		
8		319.	381.		
9		405.	483.	561.	
10			598.	694.	
11			725.	841.	
12					
13					
14					
15					

ASPEN

COMPLETE TREE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		138.	147.		
7		194.	207.		
8		261.	278.		
9		340.	361.	381.	
10			457.	481.	
11			565.	595.	
12					
13					
14					
15					

ASPEN

MERCHANTABLE BOLE

D.B.H. (IN.)	POTASSIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		77.	91.		
7		104.	125.		
8		137.	163.		
9		174.	207.	240.	
10			256.	297.	
11			311.	361.	
12					
13					
14					
15					

ASPEN

COMPLETE TREE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		42.	45.		
7		60.	64.		
8		81.	86.		
9		105.	111.	117.	
10			141.	148.	
11			174.	183.	
12					
13					
14					
15					

ASPEN

MERCHANTABLE BOLE

D.B.H. (IN.)	MAGNESIUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		19.	23.		
7		26.	31.		
8		34.	40.		
9		43.	51.	59.	
10			63.	73.	
11			77.	89.	
12					
13					
14					
15					

ASPEN
COMPLETE TREE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		24.	26.		
7		34.	36.		
8		46.	49.		
9		60.	63.	67.	
10			80.	84.	
11			99.	104.	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	PHOSPHORUS (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		7.	9.		
7		10.	12.		
8		13.	16.		
9		17.	20.	24.	
10			25.	29.	
11			30.	35.	
12					
13					
14					
15					

ASPEN
COMPLETE TREE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	40	TOTAL HEIGHT (FEET)		70	80
		50	60		
6		6.	7.		
7		9.	9.		
8		12.	12.		
9		15.	16.	17.	
10			20.	21.	
11			25.	27.	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	MANGANESE (GRAMS)				
	40	TOTAL HEIGHT (FEET)		70	80
		50	60		
6		2.	3.		
7		3.	4.		
8		4.	5.		
9		5.	6.	7.	
10			8.	9.	
11			9.	11.	
12					
13					
14					
15					

ASPEN
COMPLETE TREE

D.B.H. (IN.)	IRON (GRAMS)				
	40	TOTAL HEIGHT (FEET)			80
		50	60	70	
6		3.3	3.5		
7		4.6	4.9		
8		6.2	6.6		
9		8.0	8.5	9.0	
10			10.8	11.4	
11			13.4	14.1	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	IRON (GRAMS)				
	40	TOTAL HEIGHT (FEET)			80
		50	60	70	
6		1.0	1.2		
7		1.4	1.7		
8		1.9	2.2		
9		2.4	2.8	3.3	
10			3.5	4.0	
11			4.2	4.9	
12					
13					
14					
15					

ASPEN
COMPLETE TREE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		.7	.8		
7		1.0	1.1		
8		1.4	1.5		
9		1.8	1.9	2.0	
10			2.4	2.5	
11			3.0	3.1	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	ALUMINUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		.2	.2		
7		.3	.3		
8		.3	.4		
9		.4	.5	.6	
10			.6	.7	
11			.8	.9	
12					
13					
14					
15					

ASPEN

COMPLETE TREE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		.2	.2		
7		.3	.3		
8		.4	.4		
9		.5	.5	.6	
10			.7	.7	
11			.8	.9	
12					
13					
14					
15					

ASPEN

MERCHANTABLE BOLE

D.B.H. (IN.)	MOLYBDENUM (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		.1	.1		
7		.1	.1		
8		.1	.2		
9		.2	.2	.3	
10			.3	.3	
11			.3	.4	
12					
13					
14					
15					

ASPEN
COMPLETE TREE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		3.6	3.8		
7		5.1	5.4		
8		6.8	7.3		
9		8.9	9.4	10.0	
10			11.9	12.6	
11			14.8	15.6	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	ZINC (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		1.7	2.0		
7		2.3	2.8		
8		3.0	3.6		
9		3.8	4.6	5.3	
10			5.7	6.6	
11			6.9	8.0	
12					
13					
14					
15					

ASPEN
COMPLETE TREE

D.B.H. (IN.)	COPPER (GRAMS)				
	40	TOTAL HEIGHT (FEET)			80
		50	60	70	
6		.7	.7		
7		.9	1.0		
8		1.3	1.4		
9		1.7	1.8	1.9	
10			2.2	2.3	
11			2.7	2.9	
12					
13					
14					
15					

ASPEN
MERCHANTABLE BOLE

D.B.H. (IN.)	COPPER (GRAMS)				
	40	TOTAL HEIGHT (FEET)			80
		50	60	70	
6		.3	.4		
7		.5	.5		
8		.6	.7		
9		.8	.9	1.0	
10			1.1	1.3	
11			1.3	1.6	
12					
13					
14					
15					

ASPEN

COMPLETE TREE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		.6	.6		
7		.8	.9		
8		1.1	1.2		
9		1.4	1.5	1.6	
10			1.9	2.0	
11			2.4	2.5	
12					
13					
14					
15					

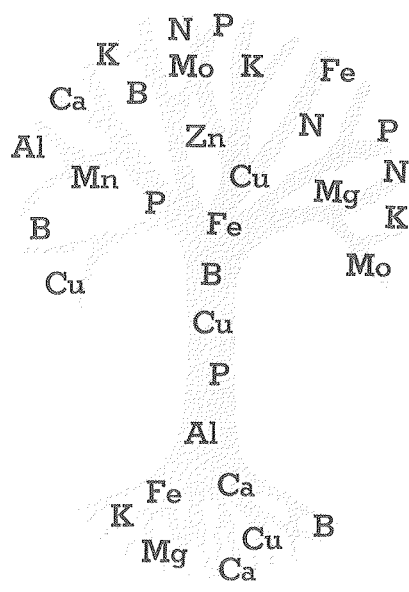
ASPEN

MERCHANTABLE BOLE

D.B.H. (IN.)	BORON (GRAMS)				
	TOTAL HEIGHT (FEET)				
	40	50	60	70	80
6		.2	.3		
7		.3	.4		
8		.4	.5		
9		.5	.6	.7	
10			.7	.8	
11			.9	1.0	
12					
13					
14					
15					

LIST OF FORESTRY PUBLICATIONS

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