10-1-1965

TB20: Preliminary Tables of Some Chemical Elements in Seven Tree Species in Maine

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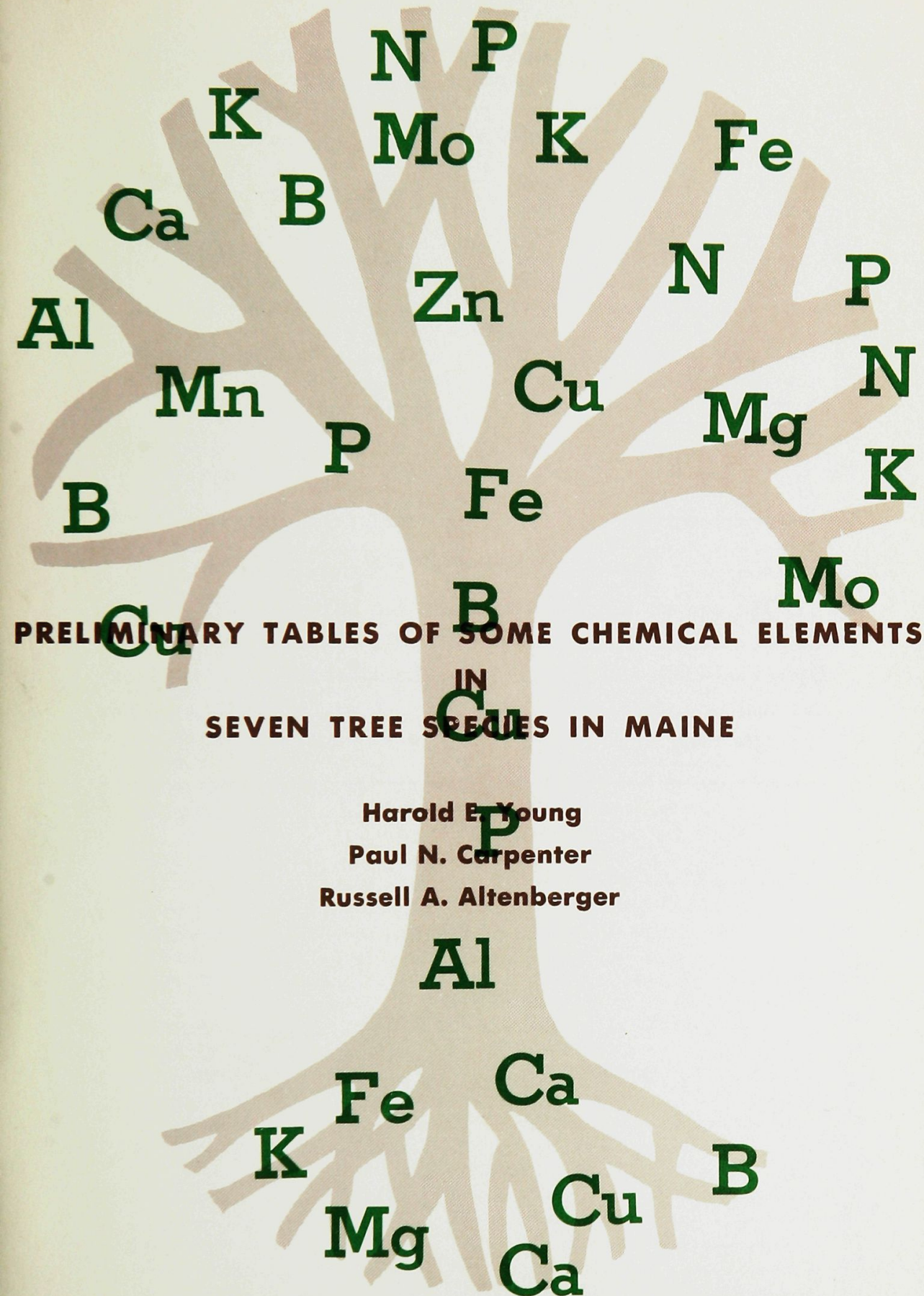

PRELIMINARY TABLES OF SOME CHEMICAL ELEMENTS IN SEVEN TREE SPECIES IN MAINE

Harold E. Young
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MAINE AGRICULTURAL EXPERIMENT STATION
Technical Bulletin 20 University of Maine October 1965

Acknowledgments

The authors wish to acknowledge the following: Mrs. Ruth A. Burpee, Mrs. A. Faulkner, Mrs. Alice Ellis, Marshall Ashley, Richard Dyer, Paul Halle and Richard Riding for assistance in the laboratory and analytical phases of the study and Mrs. Sue Wilson for assistance in programming.

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Magnesium	8	Zinc	14
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Red Spruce

Nitrogen	17	Iron	23
Calcium	18	Aluminum	24
Potassium	19	Molybdenum	25
Magnesium	20	Zinc	26
Phosphorus	21	Copper	27
Manganese	22	Boron	28

Balsam Fir

Nitrogen	29	Iron	35
Calcium	30	Aluminum	36
Potassium	31	Molybdenum	37
Magnesium	32	Zinc	38
Phosphorus	33	Copper	39
Manganese	34	Boron	40

Hemlock

Nitrogen	41	Iron	47
Calcium	42	Aluminum	48
Potassium	43	Molybdenum	49
Magnesium	44	Zinc	50
Phosphorus	45	Copper	51
Manganese	46	Boron	52

White Pine

Nitrogen	53	Iron	59
Calcium	54	Aluminum	60
Potassium	55	Molybdenum	61
Magnesium	56	Zinc	62
Phosphorus	57	Copper	63
Manganese	58	Boron	64

Red Maple

Nitrogen	65	Iron	71
Calcium	66	Aluminum	72
Potassium	67	Molybdenum	73
Magnesium	68	Zinc	74
Phosphorus	69	Copper	75
Manganese	70	Boron	76

Aspen

Nitrogen	77	Iron	83
Calcium	78	Aluminum	84
Potassium	79	Molybdenum	85
Magnesium	80	Zinc	86
Phosphorus	81	Copper	87
Manganese	82	Boron	88

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

Harold E. Young[1], Paul N. Carpenter[2] and Russell A. Altenberger[3]

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 ¼ 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 ¼ 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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Young, H. E., and V. P. Guinn. Chemical elements in complete mature trees of seven species in Maine. 3rd TAPPI Biology Conference, November, 1965, to be published in TAPPI.

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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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 BOLE

ZINC (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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 BOLE

MANGANESE (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.H.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	80
6	83.	89.			
	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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		

HEMLOCK

COMPLETE TREE

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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		

HEMLOCK

COMPLETE TREE

COPPER (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

IRON (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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

NITROGEN (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	8(
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

NITROGEN (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	8(
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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

CALCIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

POTASSIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

MAGNESIUM (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

PHOSPHORUS (GRAMS)

D.B.H. (IN.)	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

MANGANESE (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	80
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

MANGANESE (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	80
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

IRON (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	80
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

IRON (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	80
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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

ALUMINUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

MOLYBDENUM (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

ZINC (GRAMS)

D.B.H. (IN.)	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

COPPER (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	80
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

COPPER (GRAMS)

D.B.H. (IN.)	TOTAL HEIGHT (FEET) 40	50	60	70	80
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

BORON (GRAMS)

D.B.H. (IN.)	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

BORON (GRAMS)

D.B.H. (IN.)	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					

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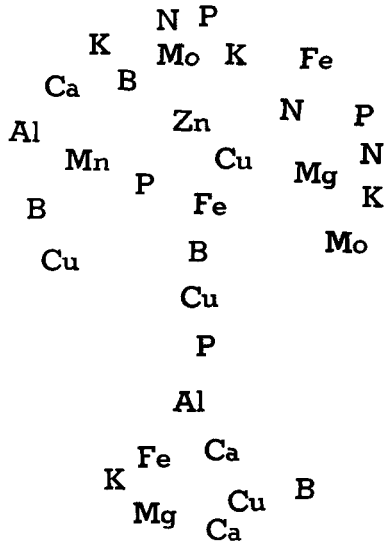
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