



NORTHERN HARDWOOD NOTES

Lumber Value And Rate Of Return For Sugar Maple

In commercial terms, trees change in three ways: by growing in diameter, growing in merchantable height, and changing in grade. So when you are marking a stand for thinning and you have to choose between two trees of the same species, you estimate what the future diameter, height, and tree grade will be for each tree if the other is cut. Then you compare the predicted changes and decide which to cut and which to leave.

It's easier to compare these changes if you can translate them into dollars. That's where the "dollar value" and "rate of return" are useful. The dollar value of lumber is the present value of a tree (of given diameter, log height, and log grade) if milled. The rate of return is simply the percent (compounded annually) at which that dollar value increases as the tree grows or changes in grade over a 10-year period. Together they provide you with numbers that allow you to say with some certainty: "The changes in tree 1 will make it increase \$18.54 in value in 10 years if left, while changes in tree 2 will make it increase \$21 .12. I'll save tree 2."

The accompanying table shows the 10-year increase in value of various combinations of diameter growth (1.4, 1.8, and 2.2 inches), 1/2-log height growth, and 1 -grade quality increase. These are the combinations you will most likely need when you are eyeballing two sugar maples and trying to decide which one to leave.

To use the table, simply find in columns 1-4 the characteristics that best describe the tree in question. Then read across to the pair of columns that best describes your prediction of what the tree will be like in 10 years. For example, if you are considering a 16-inch, 1 1/2-log, grade 2 tree that you judge will grow 2.2 inches and increase in quality by 1 grade in 10 years, you find that it will have increased in value \$8.90 (column 9a) for a rate of return of 11.7 percent (column 9b).

A couple of rules-of-thumb will help:

1. An increase of one grade is worth more than an increase of 1/2-log in merchantable height (compare columns 6a and 8a). In general, it's also true that a grade increase is worth more than a 1.8-inch increase in diameter. Rule: Leave the tree that is more likely to increase in grade the most in the next 10 years, regardless of potential increase in diameter or merchantable height.
2. Rates of return for small trees are higher than for large trees given the same rate of growth (see any "b" column). It's easy to see why: In a small tree, an inch of growth makes up a larger portion of the total tree's volume than in a large tree.

Table 1 .-Ten-year increase in value and rate of return for various combinations of diameter, merchantable height, and grade increase'

1	2	3	4	5a	5b	6a	6b	7a	7b	6a	8b	9a	9b	10a	10b
Present size, grade, and value			1.8-inch D.B.H. growth			1/2-log height growth + 1.8-inch D.B.H. growth		1.4-inch D.B.H. growth		1.8-inch D.B.H. growth		2.2-inch D.B.H. growth		1.8-inch D.B.H. growth	
D.B.H. (in.)	Height	Grade	Value			Value		Value		Value		Value		Value	
			Dollars	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
14	1/2	3	0.50	1.57	15.2	2.21	18.3	3.97	24.4	4.47	25.7	4.99	27.0	5.32	27.7
		2	2.41	2.57	7.5	3.42	9.2	5.48	12.6	6.14	13.5	6.83	14.4	7.78	15.5
16	1/2	3	1.58	2.28	9.4	3.40	12.2	5.73	16.6	6.41	17.6	7.11	18.6	7.93	19.7
		2	4.40	3.59	6.1	5.11	8.0	7.17	10.2	8.02	10.9	8.90	11.7	10.55	13.0
		1	7.84	4.59	4.7	7.11	6.7	— ²	—	—	—	—	—	—	—
	2	2	5.14	4.36	6.3	5.85	7.9	8.77	10.5	9.81	11.3	10.88	12.0	12.35	13.0
18	1/2	3	3.23	3.815	3.2	—	—	9.10	8.5	10.16	9.2	11.26	9.8	—	—
		1	11.49	5.90	4.2	—	—	—	—	—	—	—	—	—	—
20	2	2	13.20	7.80	4.8	11.30	6.4	13.86	7.4	15.60	8.1	17.25	8.7	18.51	9.9
22	2	2	19.45	9.54	4.1	—	—	16.53	6.3	18.54	6.9	20.55	7.5	—	—
24	2	2	26.95	10.92	3.5	—	—	19.10	5.5	21.12	6.0	23.16	6.4	—	—
26	2	2	35.15	12.03	3.0	—	—	—	—	—	—	—	—	—	—

¹Condensed from "Economic values for growth and grade changes of sugar maple in the Lake States", R.M. Godman and J. J. Mendel, RP-NC-155 North Central Forest Experiment Station; 1978. 16 p. Microfiche copy \$4.50. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151. Give Accession number PB 287747/AS.

²—Change not expected over the next 10 years.

The "best" size tree to grow depends on the rate of return the landowner wants. Of course if harvesting or milling costs go down in the next 10 years (or if the tree were converted into veneer instead of lumber), the net dollar value would be higher for the same size tree than before. That means the landowner could let the tree grow bigger before cutting. Even though the rate of return drops for bigger trees, the added value (because of reduced costs) would keep the rate of return above the landowner's minimum.

Reference

Godman, Richard M.; Mendel, Joseph J. Economic values for growth and grade changes of sugar maple in the Lake States. Res. Pap. NC-155 St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1978. 16 p.

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