A KEY FOR HARDWOOD TREE GRADING[1]

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INTRODUCTION TO THE TGA

This paper presents a new method for assisting in the grading of hardwood trees. This method employs a tree grading algorithm (TGA) developed from grading criteria in "Hardwood Tree Grades for Factory Lumber" USFS NE-333 (see paper by Liu et al. this volume). The TGA system is formatted as a series of 23 questions. Grading can be accomplished by following the questions in a step-by-step manner. This algorithmic grading system differs from other tree grading keys in two fundamental ways: first, it is a true algorithm using significantly fewer steps, and second, once form class has been established it alleviates the need for consulting tables or charts for upper stem diameters.

The grader executes the TGA by evaluating a statement and determining if it is true or false. The grader branches to another statement according to the answer received. The user repeats this evaluation-branching activity until the tree grade is obtained. We believe this key, as is true for others, may be particularly helpful in training activities. This poster summary paper presents the TGA system and an example grading face for demonstating the use of this key for hardwood tree grading.

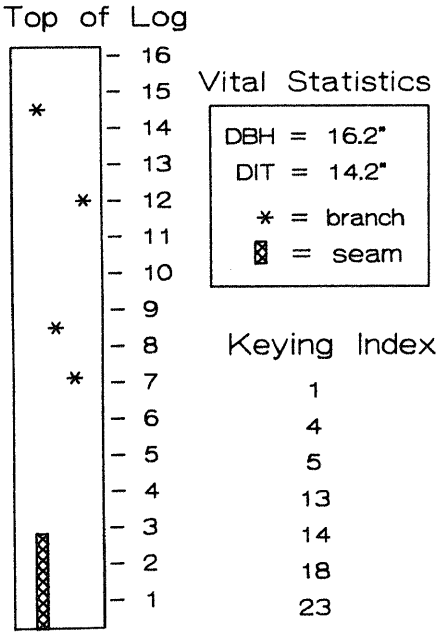
HARDWOOD TREE GRADING KEY

		YES/NO
1.	DBH ≥ 15.6" (14.6" FOR BASSWOOD & ASH)	4/2
2.	DBH ≥ 12.6"	7/3
3.	DBH ≥ 9.6"	10/BG
4.	DIT ≥ 19.6"	11/5
5.	DIT ≥ 15.6"	12/6
6.	DIT ≥ 12.6" (11.6" FOR BASSWOOD & ASH)	13/7
7.	DIT ≥ 11.6"	15/8
8.	DIT ≥ 10.6"	16/9
9.	DIT ≥ 9.6"	17/10
10.	DIT ≥ 7.6"	18/BG

		12'	14'	16'	length of grading section	
11.	SCC ≥	10'	11'8"	13'4"	1 or 2 CC--each ≥ 3' ..	20/14
12.	SCC ≥	10'	11'8"	13'4"	1 or 2 CC--each ≥ 5' ..	20/14
13.	SCC ≥	10'	11'8"	13'4"	1 or 2 CC--each ≥ 7' ..	20/14
14.	SCC ≥	8'	9'4"	10'8"	1, 2, 3 CC--each ≥ 3'..	19/18
15.	SCC ≥	8'	9'4"	10'8"	1, 2, 3 CC--each ≥ 3'..	22/19
16.	SCC ≥	8'	9'4"	10'8"	1 or 2 CC--each ≥ 3' ..	22/19
17.	SCC ≥	10'	11'8"	13'4"	1 or 2 CC--each ≥ 7'...	22/19
18.	SCC ≥	6'	7'	8'	all CC ≥ 2'	23/BG
19.	TCD ≤ 9% or [9% <Rot ≤ 40%, no S&C or SD]					G2/23
20.	TCD ≤ 9%					G1/21
21.	S&C ≤ 15% and TCD ≤ 40%					G2/23
22.	TCD ≤ 9%					G2/23
23.	TCD ≤ 50%					G3/BG

GRADING EXAMPLE USING THE TGA

Use the general TGA to assign a grade to the grading face diagram. This diagram represents the defect location on the grading face of a scarlet oak. Starting with statement one follow the sequence according to the answer obtained. The scarlet oak has a DBH of 16.2", thus the statement is evaluated yes. Proceed to statement 4. Since the upper stem diameter is less than 19.6" the TGA proceeds through statements 4 and 5. Statement 6 is evaluated yes and the grading proceeds to statement 13. The grading face diagram shows 2 clear cuttings, the first between 3 and 7 feet and the second between 8.5 and 11.5 feet, for a total of 7 feet in two cuttings in a 12 foot grading section. Using this information the TGA branches through statement 13 and 14 to 18. This statement is evaluated yes and the TGA moves to statement 23 which is evaluated yes and yields grade 3.



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