

APPENDIX 9 -- TREE GRADES

HARDWOOD TREE GRADES			
GRADING FACTORS	GRADE 1	GRADE 2	GRADE 3
Length of grading zone (ft)	Butt 16	Butt 16	Butt 16
Length of grading section ^a (ft)	Best 12	Best 12	Best 12
Minimum DBH (in)	16 ^b	13	11
Minimum DIB at the top of the grading section (in)	13 ^b 16 20	11 ^c 12	8
Clear cuttings on 3rd best face ^d minimum length (ft)	7 5 3	3 3	2
number on face (max)	2	2 3	unlimited
yield in face length (min)*	5/6	4/6	3/6
Cull deduction, including crook and sweep but excluding shake, maximum w/in grading section (%)	9	9 ^e	50

- ^a Whenever a 14- or 16-ft section of the butt log is better than the best 12-ft section, the grade of the longer section will become the grade of the tree. This longer section, when used, is the basis for determining the grading factors, such as diameter and cull deduction.
- ^b In basswood and ash, DIB at the top of the grading section may be 12-in and DBH may be 15-in.
- ^c Grade 2 trees can be 10-in DIB at the top of the grading section if otherwise meeting surface requirements for small grade 1's.
- ^d A clear cutting is a portion of a face free of defects, extending the width of the face. A face is one-fourth of the surface of the grading section as divided lengthwise.
- ^e 15% crook and sweep, or 40% total cull deduction are permitted in grade 2 if size and surface of grading section qualify as grade 1. If rot shortens the required clear cuttings to the extent of dropping the butt log to grade 2, do not drop the tree's grade to 3 unless the cull deduction for rot is greater than 40%.

*Minimum Yield in Face Length			
Face Length	Grade 1 Min.	Grade 2 Min.	Grade 3 Min.
	Yield	Yield	Yield
12-ft	10-ft	8-ft	6-ft
14-ft	11.7-ft	9.3-ft	7-ft
16-ft	13.3-ft	10.7-ft	8-ft

LOG SURFACE ABNORMALITIES THAT ARE DEFECTS IN
HARDWOOD LOGS

Adventitious bud cluster	Hole extending into the bole
Bulge, butt or stem	Embedded metal
Bump	Limb
Burl	Knot
Butt scar	Knot overgrowth
Canker	Overgrowth following insect damage or bird peck ¹
Conk	Seam, crack, split ²
Flute	Wound extending into the bole

¹ There must be four bird pecks within a square foot to affect the tree grade. First, determine the tree grade without the bird pecks. If the tree grade is determined to be 1 or 2, then down grade the tree by one grade. If the tree graded out to be a 3 or 4 without the bird pecks, then ignore them as defects and record the initial tree grade.

² A straight seam, crack, or split can be placed on the edge of one face and ignored. This fixes the location of all other faces and defects.

TIE AND TIMBER GRADE 4	
GRADING FACTORS	SPECIFICATIONS
Position in tree	Butts and uppers
Scaling diameter (in)	8-in DIB and larger
Length, w/o trim (ft)	12-ft and longer
Clear cuttings	No requirements (not graded on cutting basis)
Maximum sweep allowance	One-fourth DIB of small end for half logs, and one-half DIB for logs 16-ft long
Sound surface defects -	
Single knots	Any number, if none has an average collar ^a diameter that is more than one-third of the log diameter at the point of occurrence.
Whorled knots	Any number, provided the sum of the collar diameters does not exceed one-third the log diameter at the point of occurrence.
Knots	Any number not exceeding knot specifications, if they do not extend more than 3-in into the contained tie or timber.
Unsound surface defects ^b	Any number and size, if they do not extend into contained tie or timber. If they extend into contained tie or timber, they shall not exceed size, number, and depth of limits for sound defects.

^a Knot collar is the average of the vertical and horizontal diameters of the limb, or knot swelling, as measured flush with the surface of the log.

^b Interior defects are not visible in standing trees. They are considered in grading cut logs. No interior defects are permitted except one shake not more than one-third the width of the contained tie or timber, and one split not more than 5-in long.

EASTERN WHITE PINE TREE GRADES				
GRADING FACTORS	GRADE 1	GRADE 2	GRADE 3	GRADE 4
Minimum DBH (in)	9	9	9	9
Maximum weevil injury in butt 16-ft section (number)	None	None	2 Injuries	No limit
Minimum face requirements on butt 16-ft section	Two full length or four 50% length good faces ¹ . (In addition, knots on balance of faces shall not exceed size limitations for Grade 2 sections.)	NO GOOD FACES REQUIRED. Maximum diameter of knots on 3 best faces: SOUND RED KNOTS not to exceed 1/6 of scaling diameter or 3-in maximum ² . DEAD OR BLACK KNOTS , including overgrown knots, not to exceed 1/12 scaling diameter and 1-1/2-in maximum.	NO GOOD FACES REQUIRED. Maximum diameter of knots on 3 best faces: SOUND RED KNOTS not to exceed 1/3 of scaling diameter of 5-in maximum ² . DEAD OR BLACK KNOTS , including overgrown knots, not to exceed 1/6 scaling diameter and 2-1/2-in maximum.	Includes all trees not qualifying for Grade 3 or better and judged to have at least 1/3 of their gross volume in sound wood suitable for manufacture into standard lumber.
Maximum sweep or crook in butt 16-ft section (%)	20	30	40	No limit
Maximum total scaling deduction in 16-ft section (%)	50	50	50	No limit

After the tentative grade of the section is established from face examination, the section will be **reduced one grade** whenever the following defects are evident³:

- CONKS, PUNK KNOTS AND PINE BORER DAMAGE ON THE SURFACE OF THE SECTION
- Degrade one grade if present on one face.
- Degrade two grades if present on two faces.
- Degrade three grades if present on three to four faces.

If the final grade of the grading section is 1, 2 or 3, examine the tree for weevil injuries in the merchantable stem **above** 16-ft. If the total apparent weevil damage exceeds 3, de-grade the tree grade one below the section grade³. Otherwise the tree grade is the same as the final section grade.

¹ Trees under 16-in DBH require four full length good faces.

² Scaling diameter is estimated at the top of the 16-ft grading section.

³ No tree will be designated below Grade 4 unless net tree scale is less than one-third of gross tree scale.

WHITE PINE COLLAR DIAMETER LIMITS FOR RED AND BLACK KNOTS				
SCALING DIAMETER (D.I.B. inches)	GRADE 1 AND 2		GRADE 3	
	BLACK KNOTS 1/12 th	RED KNOTS 1/6 th	BLACK KNOTS 1/6 th	RED KNOTS 1/3 rd
7	7/12"	1 - 1/6"	1 - 1/6"	2 - 1/3"
8	2/3"	1 - 1/3"	1 - 1/3"	2 - 2/3"
9	3/4"	1 - 1/2"	1 - 1/2"	3"
10	5/6"	1 - 2/3"	1 - 2/3"	3 - 1/3"
11	11/12"	1 - 5/6"	1 - 5/6"	3 - 2/3"
12	1"	2"	2"	4"
13	1 - 1/12"	2 - 1/6"	2 - 1/6"	4 - 1/3"
14	1 - 1/6"	2 - 1/3"	2 - 1/3"	4 - 2/3"
15	1 - 1/4"	2 - 1/2"	2 - 1/2" MAX	5" MAX
16	1 - 1/3"	2 - 2/3"		
17	1 - 5/12"	2 - 5/6"		
18	1 - 1/2" MAX	3 MAX"		

Red knots – Visible branches, stubs or sockets that are from living branches or branches that have recently died. They are intergrown with the surrounding wood and contain no rot.

Black knots – Visible branches, stubs or sockets that do not conform to the definition of red knots.

Overgrown knots – Identified by a distinctive circular/elliptical pattern in the bark and are treated the same as dead knots.

Average diameter of red and black knots – Measured at the point where the limb would normally be trimmed from the main stem. For red knots measure only the heartwood portion of the knot. For black knots measure the whole limb.

SPRUCE, FIR, CEDAR, TAMARACK AND HEMLOCK				
Minimum Merchantability Specifications for Grade 1				
DIB (small end of log)	Length (2-ft multiples w/o trim)	Total Deduction	Sweep Permitted	Other Requirements*
6" - 12"	12' - 16'	50%	25%	Sound knots not over 2" in diameter permitted. Shake permitted up to 20% of gross scale if not combined with other serious defect.
13" +	12' - 16'	50%	25%	Sound knots not over 3" in diameter permitted. Shake permitted up to 20% of gross scale if not combined with other serious defect.

* One branch or sound knot that exceeds the diameter limitations is permitted to meet Grade 1 specifications.

Note: Shake is not visible on standing trees and cannot be used as a grading criteria.

SOUTHERN PINE TREE GRADES (All pines except White Pine.)			
FACE LENGTH	GRADE 1	GRADE 2	GRADE 3
16-ft grading section	3 or 4 clear faces	1 or 2 clear faces	No clear faces

After the tentative grade is established, the tree will be **reduced one grade** for each of the following:

Sweep - Degrade any tentative Grade 1 or 2 tree one grade if sweep in the lower 12-ft of the grading section amounts to 3 or more inches and equals or exceeds one-fourth the DBH.

Heart rot - Degrade any tentative Grade 1 or 2 tree one grade if conks, punk knots, or other evidence of advanced heart rot is found anywhere on the tree stem.

Note - No tree can be degraded below Grade 3, provided the total scaling deductions for sweep and/or rot do not exceed two-thirds the gross scale of the tree. Trees with total scaling deductions in excess of two-thirds are classified as cull (Grade 5).

A face is one-fourth the circumference of the 16-ft grading section and extends the full length of the grading section. Clear faces are those free from knots measuring more than 1/2-in in diameter, overgrown knots of any size, and holes more than 1/4-in in diameter. Faces may be rotated, if necessary, to obtain the maximum number of clear faces on the grading section.