RELATIVE VALUES OF DOUGLAS FIR LUMBER

by

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TABLE OF CONTENTS

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Introduction

It is a well known fact that a knowledge of values is one of the most important principles in any type of manufacturing process. This knowledge of values, in a relative sense, is particularly important in the manufacture of lumber.

Lumber and timber are manufactured in many commercial sizes and grades, and each log contains various different items of lumber, such as Wide Finish, Heavy Clears, Flooring, Drop Siding Strips, Shop, Boards, Dimension, Timbers, etc.

Because of the number of items of different value produced from the same log, each member of a saw-mill organization must have a thorough understanding of the relative values of these items. Without this it will be impossible to obtain the maximum value and greatest return in the form of profit on the finished product.

For example, a piece of 2X8-16'#1 Fir comes to the resaw station. The piece is such that it can be resawed to produce one piece of 1X8-14' "C" Fir S4S and one piece of 1X8-16'. It is the job of the resaw operator to decide whether or not the 2X8 is to be remanufactured. With a good knowledge of relative lumber values it is possible for every man involved in the mill operation to determine which item or combination of items will produce the highest value. Similar decisions as the one just mentioned must be made at many key stations in the mill by the men who actually do the work.

The purpose of this study is to show the relative values of various items of Douglas Fir lumber, which are most commonly cut and sold by the average saw-mill of a production capacity of 100,00 Board Feet or more per eight hour shift.

The purpose also is to formulate a plan whereby the key men in the manufacturing process can be made aware of the importance of relative values, and to manufacture in such a way that the most in the way of value will be obtained from the Douglas Fir log.

In the development of a plan for the study of relative lumber values, other pertinent information must be considered which can rightly be called a "by-product" of the primary purpose. For example, the general duties of the various key men in the saw-mill manufacturing process must be considered in order to obtain the proper approach to this problem.

The importance of a study such as this one is quite obvious when it is realized that staggering sums of money in the form of profits are lost each year by individual saw-mills in the lumber industry because they are not taking advantage of the opportunities which are present to raise the value of the various items cut.

With the exception of a few of the more progressive mills, there has been practically no realization of the fact that the value of their lumber can be increased by more intelligent cutting for relative values at the key positions in the mill. More intelligent cutting can be brought about by the education of those few men who are responsible for the breaking down of the log into lumber.

Approach to the Problem

It is one thing to develop a system of education of this type and quite another thing to see that it is carried out with a willingness. Therefore, any system of education will have to be presented in such a way that the key men in the mill, such as the head sawyer, edgerman, trimmerman, and resawman, will accept it and use it.

It is quite impossible to expect these men to study the problem, or even consider it, except in a casual way, unless it is presented simply and exposed to them in a manner which will be directly connected with their jobs.

This can be done by placing at each station in the saw-mill at which these critical operations take place, a chart or table of values which can be used for reference as they work. This chart would be simple in nature, easy to see and to read, with the actual comparative value of each item which the key man will manufacture in the course of his normal work.

Using this chart as a reference, it would not be long until these values would be firmly fixed in his mind and reference to the chart would very seldom be necessary.

The development of these individual work charts for each key station will come from a set of master tables, upon which the values have been determined in a manner that will be explained later in this paper.

Type of Material to be Considered

For the purposes of this study, grades will be grouped roughly into five classes: Clears, Boards, Dimension, Shop and Structural. Structural material in the form of timbers will not be charted as thoroughly as the other four classes for reasons that will be explained further.

The Clears are used for interior and exterior trim, siding and flooring in building construction, and for a few special items. Boards are here referred to in the sense of a general utility grade, for use as sheathing, form lumber, boxing and crating, and as such is not a clear type. Dimension is the general construction or framing material and finds its market in studs, joist etc.

Structural material, as was mentioned before is not covered in detail because the diversity of sizes and grades make it impractical to cut structural material of any great quantity to be carried in stock. It is necessary that production of orders for these items begin with log selection from the storage stock maintained in the log pond, and it is assumed that mills of a capacity of 100,000 Board Feet per eight hour shift have the markets and the facilities necessary for this project.

This discussion will be limited generally to items which are cut for stock, for one of the primary purposes of this paper is to show the saving that can be made in this type of cutting. Therefore, it will be limited to clear lumber, one and two inches in thickness of standard Boards, Dimension grades, Shop, some Structural material, and such special items included which have been found to be in demand and move rather rapidly. Items that are not too easily sold, or don't move too rapidly are omitted, as they can be misleading in a picture made up of comparisons. Those items which are not generally cut for stock for many and varied reasons, are also omitted, as they are of no consequence in a study of this type.

Factors Which Determine Lumber Value

Relative lumber values are, for the most part, determined by the various steps which the lumber must go through in the course of its manufacture into finished products.

For example, the breaking down of the logs in the sawmills determine whether or not all of the clear material will go into clear items, whether it is to be flat grain or vertical grain and whether the best sizes and lengths are produced.

The trimming, ripping, and resawing throughout the entire plant fix the length, size and grade value. Kiln drying, and manufacturing in the planning mill sets the use value, since dryness, grade, size length and pattern determine the use and thus the value. There are other factors to consider also, such as storage and shipping practices which effect the length, size and appearance value of the stock to be shipped.

The actual relative value of each piece of lumber will be stated as percentage, based on 1X4 Random Length B and Better Vertical Grain Flooring as the piece with a 100 per cent value. This item was chosen arbitrarily by the author because it was felt that it was the most representative of a good standard from which to work.

The actual values of the individual items, from which the relative values in terms of percentage are derived, are taken directly from the Ceiling Prices which are placed on Douglas Fir at the present time. MARCH 1, 1946

It is felt that these values, as controlled by the Ceiling Prices, are the most representative data that can be had at this time, and are also indicative of conditions in the immediate future.

There is no more concrete evidence to be had of the value of lumber than the actual dollars and cents value of it. However, it must be understood that these values are direct reflections from several different factors of production. The four main factors which influence the value are the following:

1. Grade: It can be readily seen that the grade or quality of any item influences its value, and the better

the grade the higher the value. This is particularly true of certain special items such as Car Material, Ladder Stock, and Ship Decking which call for a technical grade.

2. MANUFACTURE: The difficulty of manufacture is a determining factor in the value. If an item can be produced easily and in large quantities, the value in almost all cases would tend to be lower than that of an item which is difficult to produce.

3. SUPPLY AND DEMAND: This is an old law of economics that is well known. If the supply is small the demand tends to be large, and the consequent value is high. Conversely, if the supply is large, as in the lower grades of common, and the demand is small, the value of the product is low.

4. USE: The use value is a very difficult one to determine. However, it is true that the purpose for which an item is to be used affects its value because of the requirements of appearance, strength and wearing qualities.

Relative Values in Percentage

The following pages will include tables of the more important lumber items which the mills produce. The relative value of each in percentage, as was stated before, is based upon the 100 per cent item of 1X4 R/L B & Btr. V. G. Flooring. In the manufacture of the lumber, these relative value tables are the basic guide from which other specialized tables can be derived for the entire mill in the breaking down of the log, in the ripping and trimming of the product and the grading of the lumber.

TABLE I

1" Seasoned Clear

Size	B & Btr		C		D	
Flooring	V.G.	F.G.	V.G.	F.G.	V.G.	F.G.
1x4 R/L	100	75	91.7	71.7	75	63.4
1x6 R/L	111.7	83.4	100	80	78.4	66.7
Ceiling						
5/8x4 R/L	61.7		58.4		46.7	
1x4 R/L	75		71.4		63.4	
Drop Siding						
1x4 R/L	73.4		70		61.8	
1x6 R/L	83.4		80		66.7	
Finish						
1x4 R/L	108.4	88.4	103.4	83.4	78.4	68.4
1x6 R/L	113.4	95	108.4	90	83.4	88.4
1x8 R/L	115	95	110	90	85	71.7
1x10 R/L	125	101.7	120	93.4	95	73.4
1x12 R/L	138.4	116.7	133.4	106.7	108.4	80
Car Framing						
1x4 R/L	100	83.4	80	88.4		
1x6 R/L	116.7	91.7	88.4	105		

TABLE II

1" Dry Common Surfaced Boards

Size	Selected	Sel. Merch.	#1	#2	#3
1x4 R/L 6/20	67.6	63.4	57.5	55	41.7
12/20 R/L 6/12	70.8	74.2	60.8	58.4	45
16	71.7	68.4	61.7	49.2	45.9
20	71.7	68.4	61.7	59.2	45.8
1x6 R/L 6/20	67.5	65.8	57.5	55	41.7
12/20 R/L 6/12	70.8	69.2	60.8	58.4	45
16	71.7	70	61.7	59.2	45.8
20	71.7	70	61.7	59.2	45.8
1x8 R/L 6/20	70.8	67.5	57.5	55	41.7
R/L 6/12	74.8	70.8	60.8	58.4	45
16	75	71.7	61.7	59.2	45.8
20	75	71.7	61.7	59.2	45.8
1x10 R/L 6/20	70.8	67.5	55.8	53.4	40
R/L 6 12	74.2	70.8	55.8	56.7	43.4
16	75	71.7	60	57.5	44.2
20	75	71.5	60	57.5	44.2
1x12 R/L 6/20	75	72.5	55.8	56.7	43.4
R/L 6/12	79.2	25.8	62.5	60	46.7
16	80	76.7	63.4	60.8	47.5
20	80	76.6	63.4	60.8	47.5

TABLE III

5/4" Seasoned Clear Finish

Finish	B & Btr		C		D	
Size	V.G.	F.G.	V.G.	F.G.	V.G.	M.G.
5/4x4 R/L	115	99.2	110	92.5	85	77.5
8-10-12	118.4	102.5	113.4	95.8	88.4	80.8
14	120	104.2	115	97.5	90	82.5
16- 18-20	123.4	107.5	118.4	100.8	93.4	85.8
5/4x6 R/L	125	104.2	120	96.7	95	78.4
8-10-12	128.4	107.5	123.4	100	98.4	81.7
14	130	109.2	125	101.7	100	83.4
16-18-20	133.4	112.5	128.4	105	103.4	86.7
5/4x8 R/L	130	105	125	101.7	100	83.4
8-10-12	133.4	108.4	128.4	105	103.4	86.7
14	135	110	130	106.7	105	88.4
16-18-20	138.4	113.4	133.4	114	108.4	91.7
5/4x10 R/L	136.7	115.8	131.7	105	106.7	85
8-12-10	140	119.2	135	108.4	110	88.4
14	141.7	120.8	136.7	110	111.7	90
16-18-20	145	124.2	140	113.4	115	93.4
5/4x12 R/L	145	128.4	140	116.7	115	90
8-10-12	148.4	128.4	143.4	120	118.4	93.4
14	150	133.4	145	121.7	120	95
16-18-20	143.4	136.7	148.4	125	123.4	98.4

TABLE III A

Other 5/4" Seasoned Clear

Size	B & Btr		C	D		
	V.G.	F.G.	V.G.	V.G.	F.G.	M.G.
Flooring						
5/4x4 R/L	103.4	78.4	95	75	75	61.7
7 & Shtr	105	80	96.7	76.5	76.5	63.4
10	108.4	83.4	100	80	80	66.4
12	110	85	101.7	81.7	81.7	68.4
14	108.4	83.4	100	80	80	66.4
16-18-20	111.7	86.7	103.4	83.4	83.4	70
Stepping						
5/4x10 R/L	128.4		113.4			
7 & Shtr	133.4		118.4			
10	136.7		121.7			
12	138.4		123.4			
14	135		120			
16-18-2-	140		125			
5/4x12 R/L	136.8		121.7			
7 & Shtr	141.7		126.7			
10	145		130			
12	146.7		131.7			
14	143.4		128.4			
16-18-20	148.4		133.4			

TABLE IV

2" Seasoned Clear Finish

Finish	B & Btr		C		D	
Size	V.G.	F.G.	V.G.	F.G.	V.G.	M.G.
2x4 R/L	108.4	88.4	103.4	81.7	78.4	67.5
8-10-12	111.7	91.7	106.7	85	81.7	70.8
14	113.4	93.4	108.4	86.7	83.4	72.5
16-18-20	116.7	96.7	111.7	90.8	86.7	75.9
2x6						
R/L	116.7	95	111.7	90	86.7	76.7
8-10-12	120	98.4	115	93.4	90	75
14	121.7	100	116.7	95	91.7	76.7
16-18-20	125	103.4	120	98.4	95	80
2x8						
R/L	118.4	98.4	113.4	92.5	88.4	74.4
8-10-12	121.7	101.7	106.8	95.8	91.7	77.5
14	123.4	103.4	118.4	97.5	93.4	79.2
16-18-20-	126.7	106.7	121.7	100.8	96.7	82.5
2x10						
R/L	121.7	105	121.7	96.7	96.7	76.7
8-10-12	130	108.5	125	100	100	80
14	131.7	110	126.7	101.7	101.7	81.7
16-18-20	135	113.4	130	105	105	85
2x12						
R/L	140	119.2	135	108.4	110	81.7
8-10-12	143.4	122.5	138.7	111.7	113.4	85
14	145	123.2	140	113.4	115	86.7
16-18-20						

TABLE V

2" Dimension Dry

Size		Select Merch.	#1	#2	#3
2x4	R/L	62.4	57.5	50.8	40.8
	6	50	45	38.4	28.4
	8	61.7	57.5	50.8	40.8
	10	61.7	56.7	50	40
	12	62.5	57.5	50.8	40.8
	14	62.5	57.5	50.8	40.8
	16	64.2	59.2	52.5	42.5
	18	64.2	59.2	52.5	42.5
	20	64.2	59.2	52.5	42.5
2x6	R/L	62.5	57.5	50.8	40.8
	6	50	45	38.4	28.4
	8	54.2	49.2	41.7	33.6
	10	59.2	54.2	47.5	37.5
	12	60	55	48.4	38.4
	14	62.5	57.5	50.8	40.8
	16	63.4	58.4	51.4	41.7
	18	63.4	58.4	51.4	41.7
	20	63.4	58.4	51.4	41.7
2x8	R/L	60.8	55.8	49.2	39.2
	6	48.4	43.4	36.7	26.3
	8	58.4	53.4	46.4	36.4
	10	58.4	53.4	46.4	36.4
	12	60.8	55.8	49.8	39.2
	14	60.8	55.8	49.8	39.2
	16	60.8	55.8	49.8	39.2
	18	60.8	55.8	49.8	39.2
	20	60.8	55.8	49.8	39.2
2x10	R/L	61.7	56.7	50	38.4
	6	49.2	44.2	36.2	25.8
	8	58.4	53.4	47.5	35.8
	10	60	55	48.4	36.7
	12	62.5	57.4	50.8	39.2
	14	62.4	57.4	50.8	39.2
	16	63.4	58.4	51.7	40
	18	63.4	58.4	51.7	40
	20	63.4	58.4	51.7	40
2x12	R/L	64.2	59.2	52.5	40.8
	6	51.7	46.7	40	28.4
	8	61.7	56.7	50	38.4
	10	63.4	58.4	51.7	40
	12	65	60	53.4	41.7
	14	65	60	53.4	41.7
	16	65.8	60.8	54.2	42.5
	18	65.8	60.8	54.2	42.5
	20	65.8	60.8	54.2	42.5

TABLE V A

2" Dimension Green

Size		Select Merch.	#1	#2	#3
2x4	R/L	56.7	51.7	48.4	38.4
	6	44.2	39.2	35.2	25.2
	8	56.7	51.7	48.4	38.4
	10	56	50.9	47.5	37.5
	12	56.7	51.7	48.4	38.4
	14	56.7	53.4	48.4	38.4
	16	53.4	53.4	50	40
	18	53.4	53.4	50	40
	20	53.4	53.4	50	40
2x6	R/L	56.7	51.7	48.4	38.4
	6	44.2	39.2	35.8	25.8
	8	53.4	48.4	45	35
	10	54.2	49.2	45.8	35.8
	12	56.7	51.7	48.7	38.4
	14	56.7	51.7	48.7	38.4
	16	57.5	52.5	49.2	39.2
	18	57.5	52.5	49.2	39.2
	20	57.5	52.5	49.2	39.2
2x8	R/L	55.	50.	46.7	36.7
	6	42.5	37.5	34.2	24.2
	8	52.5	47.5	44.2	34.2
	10	52.5	47.5	44.2	34.2
	12	55	50	46.7	36.7
	14	55	50	46.7	36.7
	16	55	50	46.7	36.7
	18	55	50	46.7	36.7
	20	55	50	46.7	36.7
2x10	R/L	55	50	46.7	35
	6	42.5	37.5	34.2	22.5
	8	52.5	47.5	44.2	32.5
	10	53.4	48.4	45	33.4
	12	55.8	50.8	47.5	35.8
	14	55.8	50.8	47.5	35.8
	16	56.7	51.7	48.4	36.7
	18	56.7	51.7	48.4	36.7
	20	56.7	51.7	48.4	36.7
2x12	R/L	55	50	46.7	35
	6	42.5	37.5	34.2	22.5
	8	52.5	47.5	44.2	32.5
	10	54.2	49.2	45.8	34.2
	12	55.8	50.8	47.5	35.8
	14	55.8	50.8	47.5	35.8
	16	56.7	51.7	48.4	36.7
	18	56.7	51.7	48.4	36.7
	20	56.7	51.7	48.4	36.7

TABLE VI

2" Joist and Plank

Size	Select Structural					Barge Planking
	# 214	# 214a	# 289	# 215	# 215a	# 285
2x4						
R/L	63.4			55		
6	50.8			42.4		
8	63.4			55		
9	64.2			55.8		
12-14	63.4			55		
16-18-20	65			56.7		
2x6						
R/L	63.4			55		80
6	50.8			42.5		67.5
8	60			51.7		76.7
9	63.4			55		80
12-14	63.4			55		80
16-18-20	64.2			55.8		80.8
2x8		Add 6.6% to # 214			Add 6.6 % to # 215	
R/L	61.7			53.4		
6	49.2			40.8		
8	59.2			50.8		
9	60.8			52.5		
12-14	61.7			53.4		
16-18-20	61.7			53.4		
2x10						
R/L	61.7		86.7	53.4		78.4
6	49.2		74.2	40.8		65.8
8	59.2		84.2	50.8		75.5
9	42.5		87.5	54.2		79.2
12-14	62.5		87.5	54.2		79.2
16-18-20	63.4		88.4	55		80
2x12						
R/L	61.7		86.7	53.4		
6	49.2		74.2	40.8		
8	59.2		84.2	50.8		
9	62.5		87.5	54.2		
12-14	62.5		87.5	54.2		
16-18-20	63.4		88.4	55		

TABLE VII

Green Timbers

Size	Barge Framing P 284	#1 Permit-ing up to 15% #2	Framing & Joist P 215	Select Merch.	#1	#2	#3
3x8							
8/20	61.7	45.8	50	53.4	46.7	40	35
26/32	67.5	51.7	55.3	58.4	52.5	45.8	40.8
3x10							
8/20	59.2	45	49.2	50.8	45.8	39.2	34.2
26/32	65	50.8	55	56.7	51.7	45.8	40.8
4x4							
8/20	63.4	47.6	51.7	55	48.4	41.7	36.7
26/32	70	54.2	58.4	61.7	55	48.4	43.4
4x8							
8/20	61.7	45.8	50	53.4	46.7	40	35
26/32	67.5	51.5	55.8	59.2	52.5	45	40.8
4x12							
8/20	59.2	45	49.2	50.8	45.8	39.2	34.2
26/32	65	50.8	55	56.7	51.7	45	40
6x6							
8/20	60.8	46.7		54.2	47.5	40.8	35.8
22/30	65	50.8		58.4	61.7	45	40
8x8							
8/20	60.8	45		52.5	45.8	39.2	34.2
22/30	65	48.4		55.8	49.2	42.5	37.5
12x12							
8/20	55.8	43.4		47.5	44.2	35.8	28
22/30	59.2	46.7		50.8	47.5	39.2	30.8
22x22							
8/20	67.5	53.4		59.2	54.2	45.8	37.5
22/30	72.5	56.7		54.2	57.5	49.2	40.8

TABLE VIII

Shop Lumber

Size	Fact. Sel.		#1		#2		#3	
Type	V.G.	F.G.	V.G.	F.G.	V.G.	F.G.	V.G.	FG.
4/4x5 & Wider								
Rough Green	75	63.4	58.4	46.7	41.7	30	30	23.4
Sur. Green	76.7	65	60	48.4	43.4	31.7	31.7	25.4
Rough Kiln Dry	83.4	71.7	66.7	55	50	38.4	38.4	31.7
Sur. Kiln Dry	85	73.4	68.7	56.7	51.7	40	40	33.4
1&3/8 to 8/4								
Rough Green	75	63.4	58.4	46.7	41.7	30	30	23.4
Sur. Green	76.7	65	60	48.4	43.4	31.7	31.7	25.4
Rough Kiln Dry	86.7	66.7	70.8	50.8	54.2	34.2	42.5	31.7
Sur. Kiln Dry	89.2	69.2	72.5	52.5	55.8	35.8	44.2	33.4
10/4								
Rough Green	83.4	63.4	66.7	46.7	50	30	38.4	23.4
Sur. Green	85	65	68.4	48.4	51.7	31.7	40	25.4
Rough Kiln Dry	100	80	83.4	63.4	66.7	46.7	55	31.7
Sur. Kiln Dry	101.7	81.7	85	65	68.4	48.4	56.7	33.4
12/4								
Sur. Green	90	70	73.4	55.4	56.7	36.7	45	30
Rough Kiln Dry	105	85	88.4	68.4	71.7	51.7	60	36.7
Rough Green	88.4	68.4	71.7	51.7	55	35	43.4	28.4
Sur. Kiln Dry	106.7	86.7	90	70	73.4	53.4	61.7	38.4

A Method of Computing Lumber Values

The following is an illustration of how lumber values can be mathematically computed in the setting up of individual station tables or for general comparative purposes.

Multiply the board measure of each resulting piece by its percentage value. Add the sums together and divide by the board measure of the original piece. The answer is the percentage value of the resulting pieces and can be compared with the percentage value of the original piece.

Example:

One piece of 2X8-16' Fir with a percentage value of 56 per cent to be resawed and trimmed for a piece of 1X8-16' #1 Fir with a percentage value of 53 per cent and one piece of 1X8 "C" Finish with a percentage value of 95 per cent.

$$\frac{\text{BM.(1Pc. 1X8-16') X 53} + \text{BM (1Pc. 1X8-14' "C" Finish) X 95}}{\text{BM (1Pc. 2X8-16' \#1 Fir)}}$$

$$\frac{10\text{-}2/3 \text{ X } 53 + 9\text{-}1/3 \text{ X } 95}{21\text{-}1/3}$$

$$\frac{32/3 \text{ X } 53 + 28/3 \text{ X } 95}{64/3}$$

$$\frac{565\text{-}1/3 + 886\text{-}2/3}{64/3}$$

$$\frac{1452}{64/3}$$

$$\frac{1452}{1} \text{ X } \frac{3}{64} = 68\%$$ The value of the resulting pieces.

Compared with the original piece there is a gain of 12 per cent in relative value as the result of resawing and trimming.

General Instructions to Key Men

The following instructions are general in nature, and are not intended to be complete by any means. They are put forth only as those instructions that every man working in a key position should know as a matter of simple routine.

Sawyer.

1. The log, after being placed on the head rig, should be turned so as to get the maximum amount of clear lumber from the log rather than sawing alive.

2. Wherever possible, the clear parts of the log should be cut into cants suitable for resawing on the gang saw into flooring, siding etc.

3. When cutting the high grade logs, taper blocks should be used in order to get the maximum clear material. The weighted average cost of sawing is less where taper blocks are used.

4. Slabbing should be medium. The horizontal resaw can recover a large amount of the clear material in the slabs. However, heavy slabbing may be practical on logs of low quality and rough exterior.

5. It is wise to turn the log so as to group the defects in as few pieces as possible.

6. Cutting of the common part of the log should be largely determined by orders or need for stock of certain sizes. As little as possible of this part of the log will be cut into items that will result in one inch boards being produced, since this type of item is difficult to sell.

Edgerman.

1. It must be determined what each cant will yield from the standpoint of quality and demand for the various items.

2. The grades must be separated, if possible, on pieces containing both lower and upper grades. Where the clear and common can be separated by resawing, that particular piece should be sawed double.

3. The edging, to a certain extent, will be governed by orders and demands for particular items.

4. The boards should be square edged. Material from edgings can be recovered on the trimmer and resaw, so the edgerman must be governed by this fact in removing wane, etc. The edgerman should be careful to see that his off-bearer does not send useable material through the slasher.

Trimmerman.

1. Cut to standard lengths.

2. Square the edges.

3. Remove defects to raise relative value of material.

4. Material coming from the gang saws will contain spike knots that should be removed if the grade can be raised sufficiently to give a higher relative value for the resulting pieces.

5. In trimming, the grades and values of each individual piece and possible resulting pieces from a cut must be constantly kept in mind.

Resaw Operator.

1. Pieces should be split to obtain standard sizes.

2. Pieces should be split to separate the grades.

3. When splitting the pieces, it is essential that the resaw operator keep in mind the possibilities of raising the grade and thereby raising the value.

There are other positions in the mill that might also be considered key positions. Examples of these are the gang saw operator and the separator man. However, it is felt that their duties are more or less dependent upon the key positions that have been mentioned above, and their actions are merely mechanical ones, as a result of a major decision made previously.

<u>Specific Use of Relative Value Tables</u>

After composing the master tables of relative values, we must find practical uses for them other than acting as a guide for management in determining the cutting policy of the mill. We must convert them into a set of values that can be more easily read and understood. We must construct tables of values that are of a working value to the head sawyer, the edgerman, the resaw operator and the trimmerman.

These tables, of necessity, will have to be fairly brief, and all essential information must be placed on one page so that reading them will not require the turning of pages. The figures of values must be stated in such a manner that they will be easy to compare, and also large enough to be easily seen at a glance.

It is not necessary to develop completely all of the many and varied types of individual key man tables that this type of manufacture would require. However, there will be developed a "Trimmerman's Guide" which, it is felt, will serve as the best example of the type of table that is to be used.

This table is just one of many of this type that could be developed to meet the individual mill needs. The ways in which it could be constructed to serve the purpose are limited only in the ingenuity of the person planning the over all operation. It is well to state this table in terms of the actual dollars and cents value for each piece. The percentage value per thousand Board Feet of each item is of no particular concern to the trimmerman at this time. However, he does want to know the relative value of each individual piece. Knowing this, he can determine the extent to which he may raise the value of the piece by skillful cutting.

The following chart is an example of a "Notice to Trimmermen" for their guide in trimming for the highest value.

TRIMMERMEN REFERENCE

This table indicates the value of each piece of lumber. Reference to this table will show which pieces it is profitable to trim.

<u>Don't Trim if it Dosn't Pay!</u>

size	6	8	10	12	14	16	18	20
1x4 B & Btr	14	20	24	28	36	44	44	48
C	12	16	20	24	30	36	36	40
D	10	7	15	19	26	30	30	32
1x6 B & Btr	24	31	38	46	58	70	70	78
C	20	27	34	40	50	60	60	66
D	16	20	25	31	40	48	48	52
1x8 B & Btr	31	42	52	62	78	94	56	1.04
C	28	36	46	54	69	82	82	92
D	22	30	38	46	58	70	70	76
1x10 B & Btr	46	60	76	90	1.14	1.36	1.36	1.52
C	39	48	60	72	90	1.08	1.08	1.20
D	28	38	47	52	74	88	88	96
1x12 B & Btr	62	84	1.04	1.26	1.54	1.82	1.88	2.08
C	50	66	84	1.00	1.26	1.50	1.50	1.68
D	38	52	64	76	98	1.18	1.18	1.28
2x4 B & Btr	30	40	49	60	74	88	88	98
C	24	32	41	49	62	73	73	82
D	16	24	34	41	54	64	73	82
2x6 B & Btr	48	64	80	86	1.20	1.42	1.44	1.60
C	38	52	65	78	98	1.16	1.16	1.30
D	24	42	54	64	82	1.00	96	1.06
2x8 B & Btr	66	89	1.12	1.34	1.66	1.98	2.00	2.22
C	52	68	86	1.04	1.32	1.54	1.54	1.72
D	44	58	74	88	1.14	1.38	1.54	1.72
2x10 B & Btr	56	1.26	1.58	1.90	2.34	2.78	2.84	3.16
C	70	94	1.17	1.40	1.78	2.10	2.10	2.34
D	56	76	98	1.18	1.50	1.82	1.82	1.96
2x12 B & Btr	1.28	1.70	2.12	2.56	3.14	3.72	3.84	4.26
C	1.02	1.36	1.72	2.06	2.54	3.04	3.08	3.42
D	82	1.10	1.36	1.64	2.08	2.50	2.80	3.12

Conclusions

There is no doubt that if this method of attempting to obtain the greatest amount of value from each log is followed, there will be a substantial increase in the profits derived from the mill operation.

The probable difficulty in such a procedure lies in the inability of management to obtain the full cooperation of the key men in the manufacturing process. This cooperation can only be accomplished by a program of education, in which the men can be shown the advantages both to them and to the company.

It is quite evident, from observation of the relative values in the various master tables, that numerous "Rule of Thumb" methods can be developed from the tables for rapid calculation of the values of certain items of lumber as compared to different items which are used as a base. The study of these tables, and the development of various "Rules of Thumb" can be of a convenience to management in making decisions concerning policy. Other supervisory personnel, such as foremen, could also use many serviceable short cuts which would allow them to observe more easily the degree of perfection to which the lumber is being manufactured.

This type of cutting has long been the practice in a few of the very large mills. It can also be a success in mills of a smaller size, provided the proper understanding of the problem is grasped from the start. The success will result in a deserved increase in profit.

The lumber industry must avoid the reoccurrence of such a depressed market condition as was experienced in the difficult years following the depression. If the mills are to continue to operate in bad financial periods as well as in advantageous times, they must adopt modern cutting policies which will help to prevent under valued products from being a drug on the market.

It is not pretended that the development of a system of observing relative lumber values is a miraculous method whereby a saw-mill operator can convert his operation into a veritable "wealth producing gold mine." However, it is very true that substantial gains are to be had and the future of the lumber industry is bright when such methods become the common practice.

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