Wood Quality...

Impact on Product Yields, Grades and Value

WORKBOOK



Big or Small Trees, Fast or Slow Growing Trees?



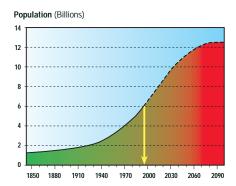


Then

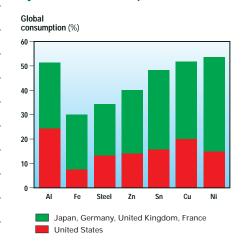


Wood Quality Impact on Product Yields	, Grades and Value.
	Wood Guality_Impact on Product Mickle Condex and Value 8010000411004 (MICRORA, IMMOR)
Will they come	
Wood and other raw materials for the 21st Century	
for the 21 st Century	

World Population 1850 to 2100



Global Consumption of Raw Materials by 10.3% of Global Population



Our Forests



Temperate coniferous and mixed forests Tropical rain forests

Wood Quality	. Impact on Product Yield	ds, Grades and Value.		
				Wink Sutton holds "The Wedge"; a 1.8 litre piece of wood that represents the average amount of wood used each day by each person on earth.
Annual W Consumpt of Wood				es: total wood harvested population of earth blood Quality_insect on Product Viside. Grades and Value.
Industrial Roundwood 1.7 billion m ³	Fuelwood 1.8 billion m³			
			Global Production of Fib	re
	Mood Quality_Impact on Product Vidids. Grades and Value. GLOBA TREACS. 900		Billions (m ³) 3.4	0.56
			Saw/veneer logs Other industrial roundwood Pulpwood Fuelwood/charcoal	Wood-based panels, ROW Wood-based panels, U.S. Wood-based panels, Canada HW lumber, World SW lumber, ROW SW lumber, Canada
				Source: FAO

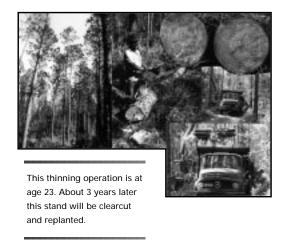
Wood Quality... Impact on Product Yields, Grades and Value.

Cost of Pulpwood – 1/91 (m³/ha/yr) (US \$/m3) Softwoods Sweden Canada/Pacific Canada/Interior Canada/East US/South Chile New Zealand Brazil Hardwoods Sweden US/South Portugal Brazil South Africa Chile (Euca) 40 30 20 10 0 10 20 30 40 50 60 70 80

Growth and Mill Delivered

Vood Quality... Impact on Product Yields, Grades and Value

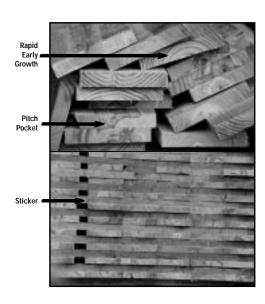




Wood Quality... Impact on Product Yields, Grades and Value BRAZIL AND NEW ZEALAND



26-year-old Caribbean pine hybrid.



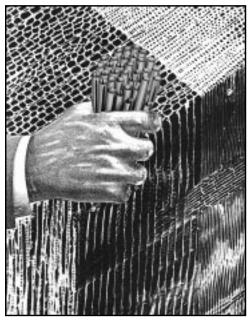
Wood Quality.... Impact on Product Yields. Grades and Value

Wood Quality Impact on Product Yields,	, Grades and Value.	
By the year 2040 New Zealand could harvest 85 million m³ of wood annually, all plantation grown. Wood Quality Report on Product Yields. Chandra and Value. BOX. RECIPIED ALARSO 110		Mood Quality—Impact on Product Yields, Grades and Value—BRASA, AND NOW STALAND. 10.02
Properties and Uses of New Zealand Radiata Pine		
VOLUME ONE - WOOD PROPERTIE Edited by J.A. Kininmonth & L.J. Whitehous		
LINE		

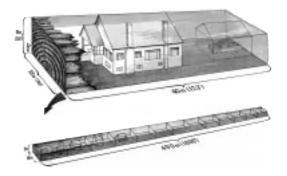
Wood Quality... Impact on Product Yields. Grades and Value
BRAZIL AND NEW ZEALAND
18.0

Wood Quality Impact on Product Yie	lds, Grades and Value.
Augus grand	
	701
	Phenology of Tree Growth Relative activity Top/crown growth Root growth
	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Whood Quality. Impact on Product Yields, Grades and Value. Title Geomy And Title Printing of Page 1975

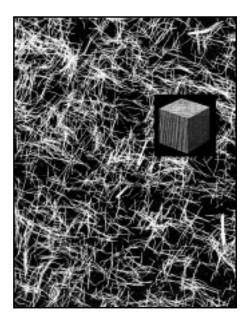
	auxins	Terminal shoot and vigorous last formed portions of the crown foliage produce growth regulating hormones (auxins) and photosynthate. Lateral and downward translocation of auxins to reach lower stem. In spring radial growth begins first at the top of the tree and proceeds gradually downward = more EW and wider rings in upper crown region near pith. Less EW and smaller rings at the base where rings are far from pith. Transition to LW occurs first near the base, farthest from the source of auxin supply and proceeds upward. The destiny (and density) of an individual fibre is thus determined by its relative position; its distance from the active live crown region and the time of its formation (season).
Allometry		Mood Quality_impact on Product Molds, Grades and Million TREE GROWTH AND TREE PRINCIPLY FOR THE PRINCI
(allocation of photosynthetes)		



Wood Quality... Impact on Product Yields. Grades and Value

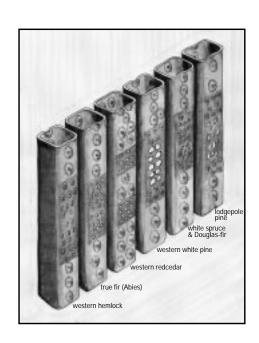


Wood Quality Impact on Product Yields, Grades and	Value.
	Wood Anatomy
	Wood Guellty Impact on Product Violes. Grades and Value wood STRUCTURE AND WOOD ANATOMY 25.0
	Earlywood Pits
	air(lumen)
	Latewood
	Mood Quality_ Impact on Product Violds, Grades and Malun wood STRUCTURE AND WOOD ANALYSIS. 25.0



Wood Quality... Impact on Product Yields. Grades and Value
WOOD STRUCTURE AND WOOD ANATOMY 27.0

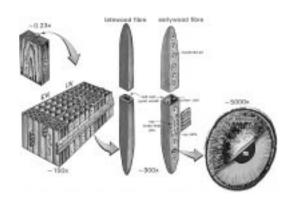




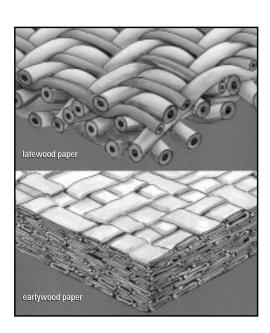
Wood Quality... Impact on Product Yields. Grades and Value WOOD STRUCTURE AND WOOD ANATOMY 28.0

Douglas-fir western
Douglas-fir western redeedar Wood Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Value account of the Chalify Impact on Product Violeth, Glades, and Chalify Impact on Product Violeth, Chal
resin duct solid wood substance
substance air

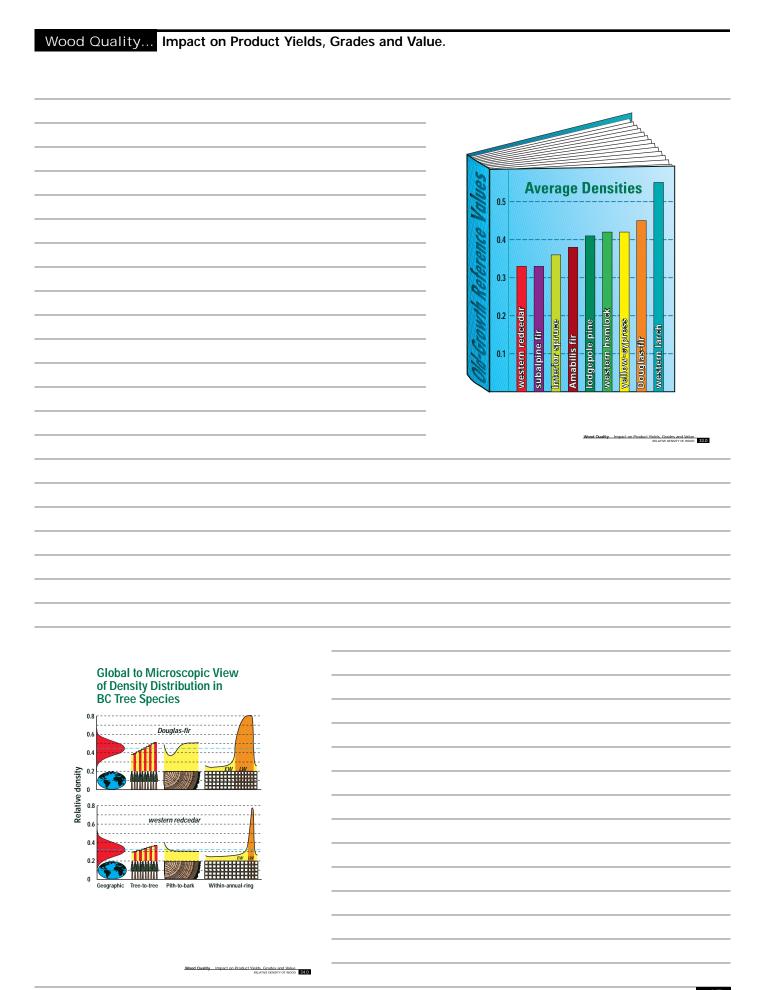
Wood Quality... Impact on Product Yields. Grades and Value
WOOD STRUCTURE AND WOOD ANATOMY 30.0



Wood Quality... Impact on Product Yields, Grades and Value
WOOD STRUCTURE AND WOOD ANATOMY 31.0



Wood Quality... Impact on Product Yields, Grades and Value



Vood Quality Impact on Product Yields	Grades and Value.	
Wood Density Variation within Growth Rings annual ring Yellow-cypress wood sample		
1.0 0.8 0.6 0.4 0.2 0.0 LW EW annual ring		
Douglas-fir wood sample 1.0 0.8 0.6 0.4 0.2 0.0		
FW LW Nood QualityImpact on Product Viside. Grades and Mules assuring experts of wood. \$15.00		

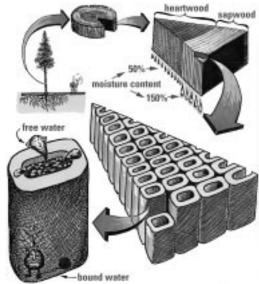
Wood Quality Impact on Product Yields, Grades and V	value.
	Mond Quality Impact on Brocket Yields, Grades and Males. Sortina trice, Grades and Males. Mond Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields, Grades and Males. And Quality Impact on Brocket Yields. And Quality Impact
	Relative Density at BH of Rapidly Grown B.C. Woods 0.55 0.50 0.45 0.40 0.35 0.30 0.25 0.20 0.20 0.20 0.20 0.20 0.20 0.2

ood Quality Impact on Product Yields	
Mature wood Juvenile wood Compression wood	
Wood Quality_Impact on Product Yields, Grades and Value— Approach stocks stocks stock to the stock of the sto	
	Second Growth Douglas-fir Fibre length (mm) 4.0 3.5 3.0 2.5 Breast height 20% height 40% height 60% height 60% height 80% height 80% height
	1.5

Wood Quality Impact on Product Yields,	Grades and Value.
	Western Redcedar Ethanol:Benzene extractives (%) 24 Old growth Second growth Number of rings from pith
	Wood Quality Import on Product Visids - Condex and Males Assess 9000, 020094 (9888) 9000.
Wood fibres from U.V. (ultraviolet) exposure damage from sunlight.	

Wood Quality... Impact on Product Yields, Grades and Value
JUVENILE WOOD, CROWN-FORMED WOOD 43.0

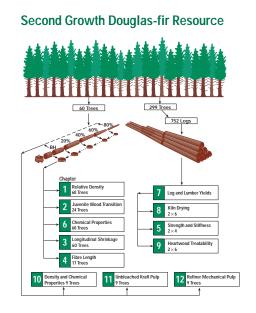
Wood Quality Impact on Product Yields, Grades and	l Value.
	Compression Wood
	Mood Quality_Impact on Product Visids, Grades and Value conversions wood 46.0
	Typical Shrinkage Values for "Normal" Wood
	6 13% x 2 2 6 2 7



Mood Quality—Impact on Product Violds, Crades and Makes
WRENACT OF WOOD 800

Wood Quality... Impact on Product Yields, Grades and Value. The Process of Wood Drying Drying Stage: Ш Below FSP throughout, Above fibre saturation Shell now below FSP, Moisture point (FSP) throughout: Drying begins with loss of free water from surfaces. core still above FSP. Core moisture migrates eventually reaches uniformly low EMC. Condition: outward to shell. Shell below FSP (in tension) Slight cup (due to board being flat-grained) Shell under compression Growth ring boundary Core above FSP (under compression) Above FSP Core in tension Shell tries to shrink, creates Core now trying to shrink Stress Stress-free tension across surfaces, squeezes the core into compression. Drying sets shell in oversized condition away from oversized shell. Core develops tension, pulls shell into compression. Condition: Surface may check; core may collapse. Defects: Defect-free Surface is casehardened; $core\ may\ honeycomb.$

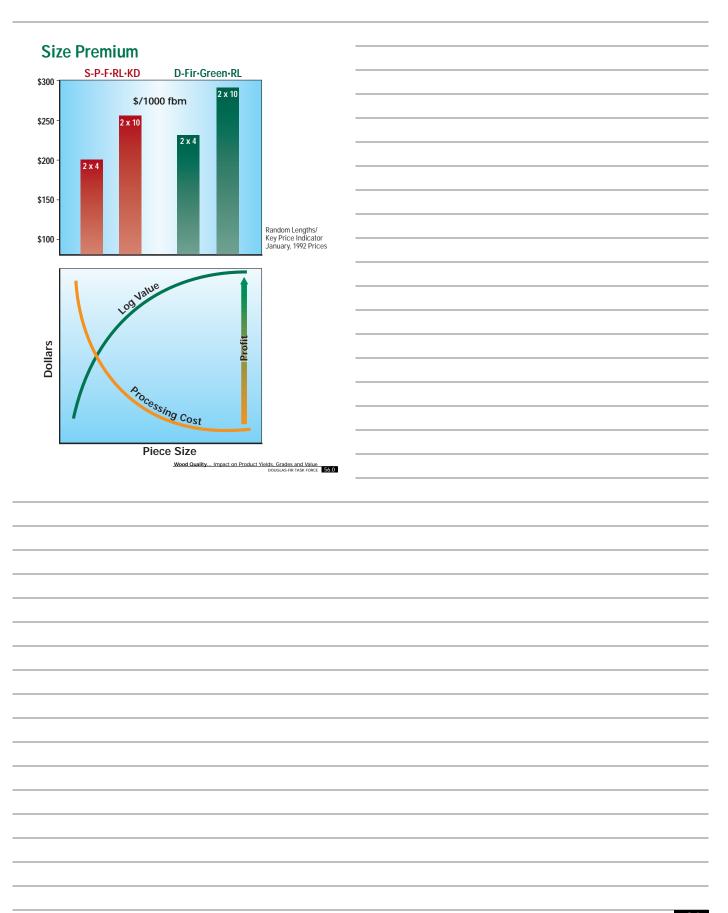




Wood Quality... Impact on Product Yields, Grades and Value SHRINKAGE OF WOOD 51.0

Wood Quality... Impact on Product Yields. Grades and Value DOUGLAS-FIR TASK FORCE

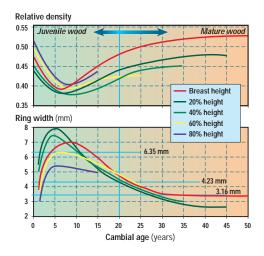
Wood Quality Impact on Product Yields	, Grades and Value.
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Whood Quality Impact on Product Violds. Gradies and Value- ECOGLAS FIR TOAK FEBRU.	
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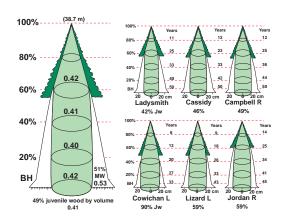
Wood Quality Impact on Product Yields, Grades and Value.		
2x12 2x8 2x4		
Select Structural Select Structural		
No.1		
0 0 0		
No.2		
Scale: hadankadasi		
Mood Quality Impact on Broduct Visids, Coales and Vision Social Aceter Year Free: \$10		

Wood Quality... Impact on Product Yields, Grades and Value.

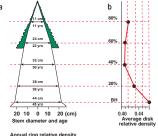
50-year-old Douglas-fir

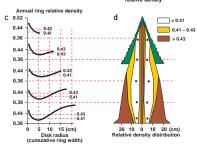


Juvenile Wood Cylinder First 20 Years of Growth in 50-year-old Douglas-fir



Diameter, Taper and Density Distribution in Douglas-fir





Mood Quality Impact on Product Yields, Grades and Value DOUGLAS-FIR TASK FORCE 60

Relative Density Zones in Douglas-fir

Relative density 100% 60% 40% 20% 0 Cassidy (0.45) 20 0 10 (cm) Campbell R (0.43) 20 0 20 Ladysmith (0.42) 20 20 20 100% 40% 20 0 20 Ó 20 20 0 10 (cm) Cowichan L Lizard L Jordan R (0.43)(0.43)(0.43)< 0.41 0.41 – 0.43

Wood Quality Impact on Product Yields, Grades and Value DOUGLAS-I'R TASK FORCE 610

ood Quality Impact on Product Yields	s, Grades and Value.
	Juvenile/Mature Wood Ring Profiles Relative density
	0.78 0.52 x = 0.41 30% 0.52
	Average ring width (mm) **Mood Quality*** Impact on Product Violes. Grades and Value.** **COURLAN FOR TOOK TOOK TOOK TOOK TOOK TOOK TOOK TO
Stem-wood Relative Density Relative density	
Second growth Old growth Old growth Old growth Old growth Jessonie	
0.40-Douglas-fir Task Fores 0.36-	
0 25 50 75 100 125 150 175 200 225 250 Age at breast height (years)	

Wood Quality Impact on Product Yields, Grades and Value.		
	Conclusions:	
	→ These 50-year-old Douglas-fir trees, growing at 530 stems/ha, contained 50% juvenile wood and 50% mature wood.	
	→ At all height levels, the first 20 years of growth "defaulted" to juvenile wood because of wood density, fibre length, and longitudinal shrinkage.	
	→ Juvenile wood is not useless wood.	
	→ Larger knots permitted in wider widths.	
	→ Challenge: find optimum between tree size and branch size at rotation age to maximize value, keeping future trends in mind.	
	\$/ha/yr commercial forestry has to be profitable	
	Other non-woody pressures on the land base – social forestry	
	Whood Quality Impact on Product Vields. Crades and Value.	
	DOUGLAS-RE YASK FORCE	
	Average Dimensions of Small, Medium and Large Diameter Lodgepole Pine Task Force Trees	
	Open-grown Alta. B.C. G H I	
	25	
	(E) 20	
	51% 515	
	100% 44% 35% Base of live 100%	
	(E) 30 2x10	
	© 30 H 20 H 20	
	DBH (cm) 37.0 37.6 35.7 27.5 17.8 17.5	
	Age (yrs) 71.0 91.0 85.0 121.0 96.0 95.0 Stems/ha 1 600 900 1300 1800 2300	
	Density BH 0.36 0.37 0.38 0.41 0.43 0.46 Stem Density 0.37 0.37 0.38 0.39 0.40 -0.43 Stem Volume 0.81 1.00 0.92 0.47 0.18 -	

Wood Quality... Impact on Product Yields, Grades and Value. Average Disk Density at Five Sampling Heights Mariboro Average of six large diameter sites Bingay Creek Medium (Fording Min.) Small (Fording Min.) Medium (Supher) & Small (Sulpher) Control ВН 0.38 0.40 0.42 Disk Relative Density 0.34 0.36 0.38 0.44 Pith-to-bark Wood Density and Tree-size Trends as a Function of Stand Density Pith-to-bark wood density - 16 cm, 95 yrs at BH; 2300 live stems/ha 0.45 • 18 cm, 96 yrs at BH; 1800 live stems/ha 28 cm, 121 yrs at BH; 1300 live stems/ha 0.40 40 cm, 90 yrs at BH; 700 live stems/ha 0.35 40 cm, 71 yrs at BH; open-grown tree 2.5 10 12.5 0 15 17.5 20 Disk radius (cm) Resource-average — basic relative density for lodgepole pine 0.41

Wood Quality	Impact on Pro	duct Yields, Gi	rades and Value.		
				28 Sites A-F 24 Sites A-F 25 Sites A-F 26 Sites A-F 27 Sites A-F 28 Sites A-F 29 Sites A-F 20 Sites A-F 20 Sites A-F 20 Sites A-F 21 Sites A-F 22 Sites A-F 23 Sites A-F 24 Sites A-F 25 Sites A-F 26 Sites A-F 27 Sites A-F 28 Sites A-F 29 Sites A-F 20 Sites A-F 21 Sites A-F 22 Sites A-F 23 Sites A-F 24 Sites A-F 25 Sites A-F 26 Sites A-F 27 Sites A-F 28 Sites A-F 29 Sites A-F 20 Si	Second Growth Lodgepole Pine Density Distribution

Wood Quality Impact on Product Yields	s, Grades and Value.
	300
	200
	0 10 15 20 25 30 35 40 45 50 Lumber Top Diameter Class (cm) Volume (%)
	100 90 80 70 60 50 40 30 20 10 15 20 25 30 35 40 45 50 Top Diameter Class (cm)
	Top Diameter Class (cm) Wood Qualityinteger on Product Middle, Coadin and Make. Jacobsept with York Order. Jacobsept with York of Product On Product Coading and Make. Jacobsept with York Order. Jacobsept with York Order. Jacobsept with York Order. Jacobsept with York Order.
	LOGISTICAL PINE TAGE PRINCE.
Nil 🕜	
juvenile wood	
juvenile wood mature wood sheet was	
earston sheet	
7	
the I-beam analogy -	

nber Yields by Visual Grading Reject Econ. No. 3 No. 2 No. 1 SS
Stand Density (stems/ha) Wood Quality_Impact on Product Visits, Grades and Vehice LOCATION FIRST TORK FORCE.
ndow and Furniture-Grade ields by Visual Grading
Reject 6th 5th 4th

Wood Quality... Impact on Product Yields, Grades and Value.

MSR Summary	
Uses of MSR Lumber → Primarily for roof trusses, I-joists, laminating	
stock for glulam	
 Parallel chord floor trusses – new market (ease of handling, longer spans, ready openings for wiring, plumbing and ductwork) 	
Advantages of MSR Lumber • better consistency because of E rating (more uniform "links")	
quality control in the plant – none with visually graded lumber can be cut from small logs (no need	
for very wide widths) • reduced variability = reliability and exactness • reduced waste (2% vs 10%)	
 uniformity across "species boundaries" (fewer grades) Profit (marketability) 	
,	
	MSR Grading System
	1
	F F
	Total cell (in a pray
	Bridge Company
	F
Strength of wood	0000
is the resistance to forces deforming it. There are still other things besides relative	
density that affect the strength of wood.	
These include knots, slope of grain, compression wood, the relative amounts of	Wood Quality Impact on Brooker Yields, Grades and Value MACHINE STRESS BATTO PARTILINATES: PALO
earlywood and latewood, moisture content, temperature (above 65°C), and fibril angle (the	
part of the tree, near the pith, or farther out from which the piece was cut).	
→ A few basic terms in wood mechanics: force: push, pull and shear	
stress: force per unit area (psi)	
strain: unit deformation stiffness (elasticity): stress/strain	
<pre>creep: continuously stressed in bending, "flow", "sag"</pre>	
fatigue: loss in wood property due to repeated force application (bending back	
and forth, 1/3 max. stress, 30,000,000 times)	
Wood Quality Impact on Product Visids. Grades and Visite MACHINES BATTO (MISSING LIMBER) 73.0	

Wood Quality Impact	on Product Yields	Grades and Val	ue.	
Machine-stress rated lu	ımber yields			
Distribution of MSR Grades for 2x4's				
70 -	700 s/ha 1100 s/ha			
50	1900 s/ha			
40 - 30 -				
(so 20 10 10 10 10 Reject 1650f	2100f 2400f			
80 Tolerand				
50 - 60 -	700 s/ha 1100 s/ha 1900 s/ha			
50 - 40 -				
30 -	_			
20 - 10 -				
Reject 1650f MSR Grade	2100f 2400f			
Distribution of MSR Grades for 2x6's	by Stand Density Impact on Product Visids, Grades and Value MACHINE STRESS RATED (MSR) LUMBER 76.0			

			PF KD Std ngths – 2)		
	US FU FOB N 400 - 350 - 300 - 250 - 200 -		1996	~~	1995
	150 \$	4 8 12	Weeks		1991
	M			on's Canadian Lumber Report Stried—8'/2	
	165 180 210 240	50f \$490 00f 495 00f 495	{450} {455} {460} {480}	\$440 n/a 465 480	{400} n/a {425} {440}
				*Prices are in U.S. fur Prices in () and sereported by Madison's Cal	re f.o.b. Vancouver
			,		
			,	Wood Quality Impact on P	roduct Vields, Grades and \ MACHINE STRESS RATED (MSR) LU
				Wood Quality Impact on P	roduct Yields. Grades and V
				Wood Quality Impact on P	roduct Melds. Grades, and M MACHINE STRESS RATED (MSR), LU
				Wood Quality Impact on P	roduct Melds. Grades, and M MACHIE STRESS BATED (MSR), LU
				Wood Quality Impact on P	roduct Welds, Grades, and W MACHINE STRESS PATED (MSR), LU
				Wood Quality Impact on P	roduct Yields. Grades and V
				Wood Quality Impact on P	rootust Yields. Grades, and W
				Wood Quality Impact on P	roduct Melds. Grades, and M
				Wood Quality Impact on P	PRODUCT VIOLES, GRANDS SERVER MACHINE STRESS RATED (MSR), U

 Breast Height
 Breast Height Relative Density
0.50 - · · · · · · · · · · · · · · · · · ·
0.46
0.44
0.42
0.36
 0.32
0.30
 20 25 30 35 40
Sulphur Springs (MS) = SS
0.50 - D.b.h. Class (cm) 40 45
0.48 - 1
 0.46 -
 0.42 T
0.34
0.32
 0.30 SS SSJCWELI ELML SS JCWELI FLML SS JCWELI ELML SS JCWELI ELML JC LI ELML
 Location Wood Quality Impact on Product Vields Grades and Value
 Wood Quality Impact on Product Yields, Grades and Value LODGEPOLE PINE CONFIRMATION STUDY 78.0

Wood Quality... Impact on Product Yields, Grades and Value.

Wood Quality Impact on Product Yields, Grades and	d Value.
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	od nkage
	ensity d/Sapw in wo
	% % % % % % % % % % % % % % % % % % %
	80%
	70%
	(00)
	60%
	50%
	40%
	30%
	2007
	20%
	Breast ht. 70 cm
	Stump ht.
	Sampling plan for basic wood properties characterization of second-growth western hemlock.
	Wood Quality Impact on Product Vields. Grades and Value. WISTERN HERICOCK BASIC WOOD PROPERTIES 79.0

Wood Quality... Impact on Product Yields, Grades and Value. Second-growth Western Hemlock Disk Densities at 12 Heights for Five Sites Average Relative Density Port Mellon 840 ste Port Hardy 650 ste Lake Cowichan 440 ste Port Hardy M22 1000 st Port Renfrew 986 ste 0.50 0.48 0.46 0.42 ← Old growth species average 0.40 0.38 20 30 40 50 60 70 80 90 100 % of Tree Height Wood Quality... Impact on Product Yields. Grades and Value WESTERN HEMLOCK BASIC WOOD PROPERTIES 80.0 Second Growth Hemlock – Total Stemwood Density Distribution Total Stem Density 0.50 0.45 0.35 Port Mellon Port Hardy Lake Cowichan Port Hardy M22 Port Renfrew

0.3

40 60 Cambial Age 100

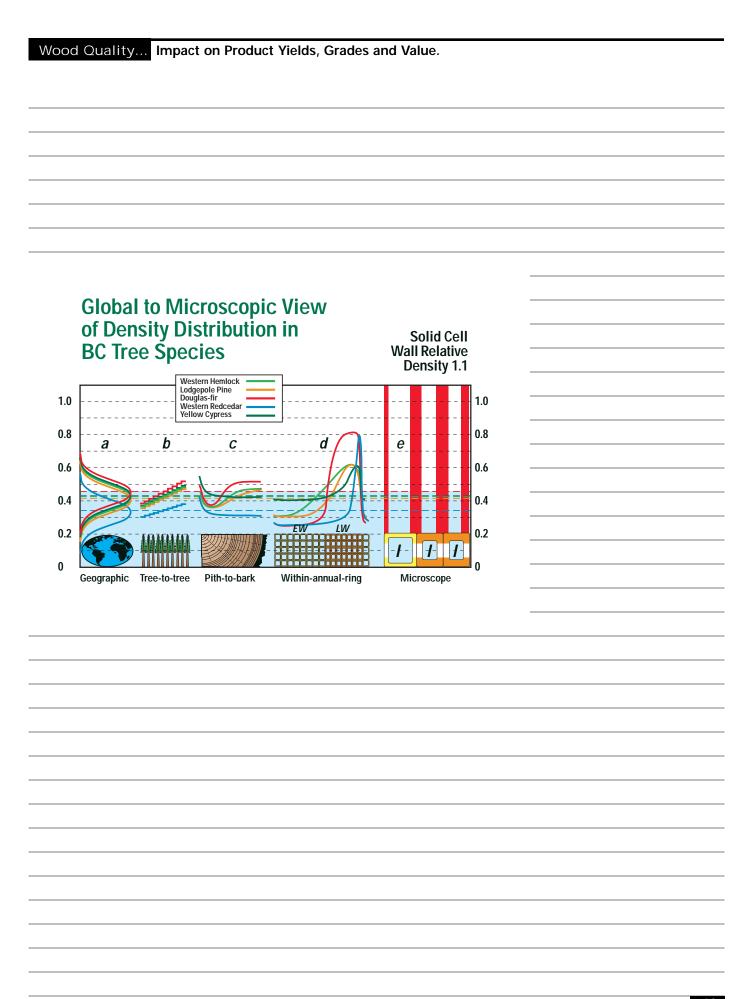
Wood Quality... Impact on Product Yields, Grades and Value. Lake Cowichan Summary of 13 trees (450 stems/ha) 45 _ 42.3 m 42.3 m Tree Height (m) 25 -400 200 0 200 400 600 Area (cm2) Stem Radius (cm) Relative Density Zone: <0.40 0.40 - 0.43 >0.43 Wood Quality... Impact on Product Yields. Grades and Value WESTERN HEMLOCK BASIC WOOD PROPERTIES 84.0 Port Hardy M22 Summary of 13 trees (1000 stems/ha) 39.7 m Tree Height (m) 25 -20 -BH 70 cm stump Stem Radius (cm) Area (cm2) Relative Density Zone: <0.40 0.40 - 0.43 >0.43

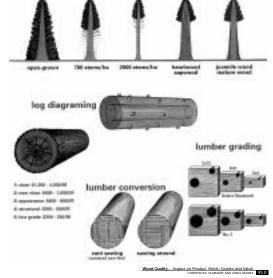
Wood Quality Impact on		Average and Dens	Tree Ste	m Profile ibutions		
	F0	Port Mellon 840 stems/ha	Port Hardy 650 stems/ha	Lake Cowichan 440 stems/ha	Port Hardy M22	Port Renfrew 986 stems/ha
	Tree Height (m) 10 - 45 - 40 - 35 - 20 - 15 - 20 - 50 - 50 - 50 - 50 - 50 - 50 - 5			Stem Radius (cm)		
	50 - 45 - 40 - 35 - 35 - 35 - 20 - 15 - 10 - 5 - 0 - 0 - 10 - 10 - 10 -			Area (cm²)		
		Relativ	e Density Zones:	< 0.40	0.40 - 0.43	> 0.43

Wood Quality Impact on Product Yields,	Grades and Value.
Western Hemlock Port Hardy	
Total Stem Density 0.6	
0.5	
0.4	
0.3	
0 20 40 60 80 100 Cambial Age	
Mood Quality. Impact on Product Yields, Grades and Value. WESTERVIEW.OCK MOOF WOOD PROFESTES. 87.0	
WESTER HEALOCK MADE WOOD PROPERTIES 18740	

Wood Quality... Impact on Product Yields, Grades and Value. **Global to Microscopic View** Solid Cell Wall Relative Density 1.1 of Density Distribution in Western Hemlock Wood Quality... Impact on Product Yields. Grades and Value WESTERN HEMLOCK BASIC WOOD PROPERTIES 88.0 Western Hemlock Log Grade Old-growth Second-growth \$ 10,000 \$ 4,000 small Ø D log length 12 – 36 in. **H** 16 – 24' 12,000 8,000 15 – 36 in. 12 – 14' 12,000 15,000 4 – 11 in. **J** 16 – 24' 5,000 20,000 4 – 14 in. 15 – 36 in. **X** 8 – 14' 8 – 10' 6,000 4,000 4 – 36 in. **Y** < 8' 5,000 4,000 Total \$ 50,000 \$ 55,000 • Stand volume in second-growth 150 – 200m³ higher than in old-growth WFPL - North Vancouver Island od Quality... Impact on Product Yields, Grades and Value WESTERN HEMLOCK BASIC WOOD PROPERTIES 89.0

Wood Quality Impact on Product Yield	s, Grades and Value.	
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Wood Quality... Impact on Product Yields, Grades and Value composites, summary and conclusions 95.0