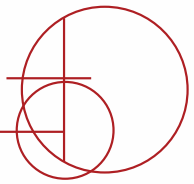
WOODTECH

MEASUREMENT SOLUTIONS

AN EXCELSYS COMPANY

Woodtech - Updates



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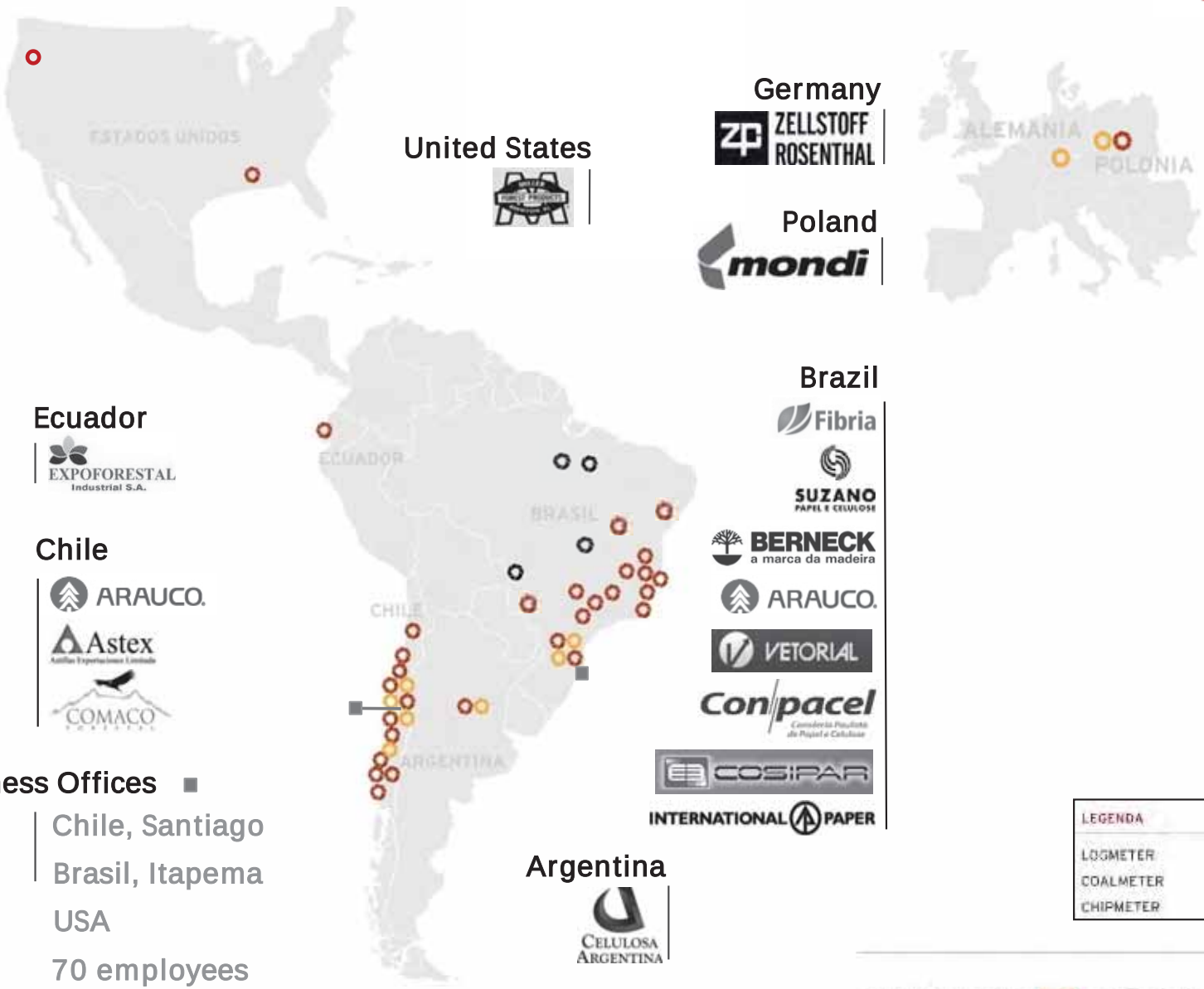
Woodtech - 2012



United States

Germany

ZELLSTOFF ROSENTHAL

Poland

mondi

Brazil

Fibria

SUZANO PAPEL E CELULOSE

BERNECK a marca da madeira

ARAUCO.

VETORIAL

Conpacel

COSIPAR

INTERNATIONAL PAPER

Ecuador

EXPOFORESTAL Industrial S.A.

Chile

ARAUCO.

Astex

COMACO

Argentina

Celulosa Argentina

Business Offices

- Chile, Santiago
- Brasil, Itapema
- USA
- 70 employees

LEGENDA

LOGMETER

COALMETER

CHIPMETER

$2 billion/year wood measured

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Woodtech offers an alternative to:

- Manual measurement
  - Slow & expensive
  - Low reliability (experience and method)

- Weigh-scaling
  - Inaccurate due to wood variables (MC & Density).
  - It is not accurate to estimate cubic volume as a function of green weight.

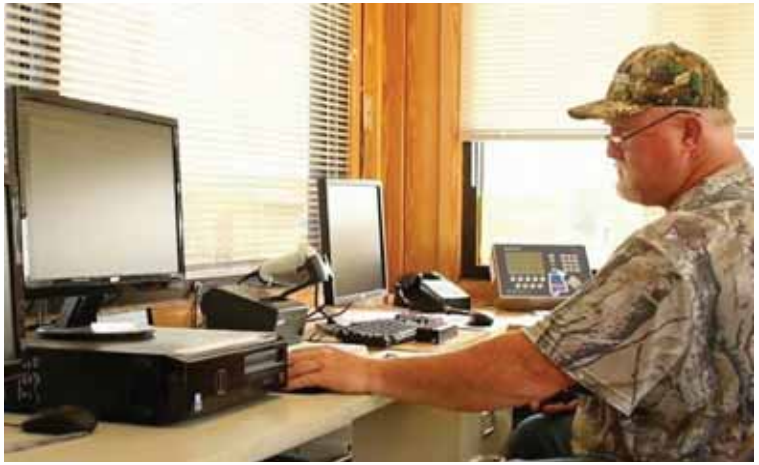
Logmeter 4000

Calibration Frame

Validation load

There are 20 cylinders in the validation load

Log Marker



Operator selects defective logs on the picture and the Log Inspector incorporates defects for deduction.

Logmeter Defect Detection

Defect detection is done before the logs are unloaded

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Log Marker Report

1 Split
2 Swelled butt
3 Uneven butt
4 Outside pre-cut

Logmeter® Estimates

Total Volume (cf)	45
Number of stems	40
% of Butt Diam. Scanned	50%
% of Top Diam. Scanned	60%
Log on Spec	85%

Logmeter® Visual Inspection

Type of Defec	Number
4 - Split	1
6 - Swelled bu	1
8 - Uneven bu	0

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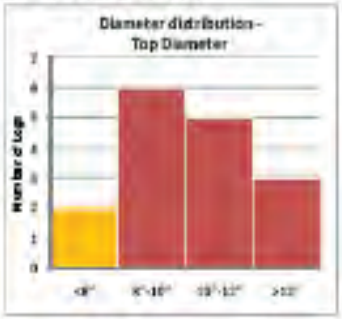
Back Camera

Auditing System

Auditing System Home Page

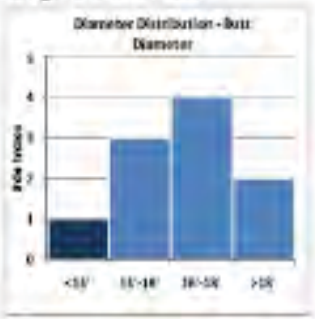
Logmeter® Scanning

Small end diameter



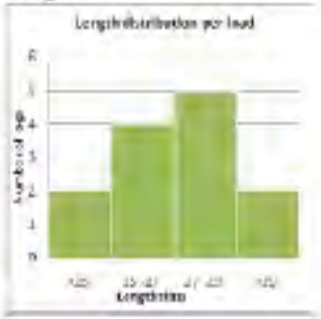
Average SED	10,2"
Total Scanned Lo	17
Defects	2
Crook/Sweep	1

Large End Diameter



Average LED	16,3"
Total Scanned	14
Defects	1

Length



Average lengt	27'
Total Scanned	10
Defects	0

Logmeter® Estimates

Total Volume (cf)	45
Number of stems	40
% of Butt Diam. Scanned	50%
% of Top Diam. Scanned	60%
Log on Spec	85%

Logmeter® Visual Inspection

Type of Defec	Number
4 - Split	1
6 - Swelled bu	1
8 - Uneven bu	0

Report Sample

Analytical Tool

Filters			
Product	Land Owner	Contract No	Vendor No
regular logs			

Time span	
From:	15/Feb/2011
To:	20/Apr/2020

Large End Diameter (LED)		
Range [in]	Count	%
<12	5,345	14%
12-15	18,510	50%
15-20	11,915	32%
20-26	1,152	3%
>26	56	0%
Total	36,978	

Average LED	14.6	inches

Small End Diameter (SED)		
Range [in]	Count	%
<8	3,615	10%
8-10	21,168	57%
10-12	8,963	24%
12-14	2,357	6%
>14	1,198	3%
Total	37,301	

Average SED	9.9	inches

Length		
Range [ft]	Count	%
<25	790	3%
25-35	4,735	16%
35-45	13,398	47%
45-65	8,989	31%
>65	793	3%
Total	28,705	

Average Length	40.9	feet

Sample Data

Item	Count	% Scanned
Scanned Loads	2,516	
Scanned LED	36,978	50%
Scanned SED	37,301	51%
Scanned Length	28,705	39%
Est. No. of stem	73,818	
Est. Stems/Load	29	
Total Volume [c	1,164,841	
Volume/Load	463	
Volume/Stem	16	

Defect Summary

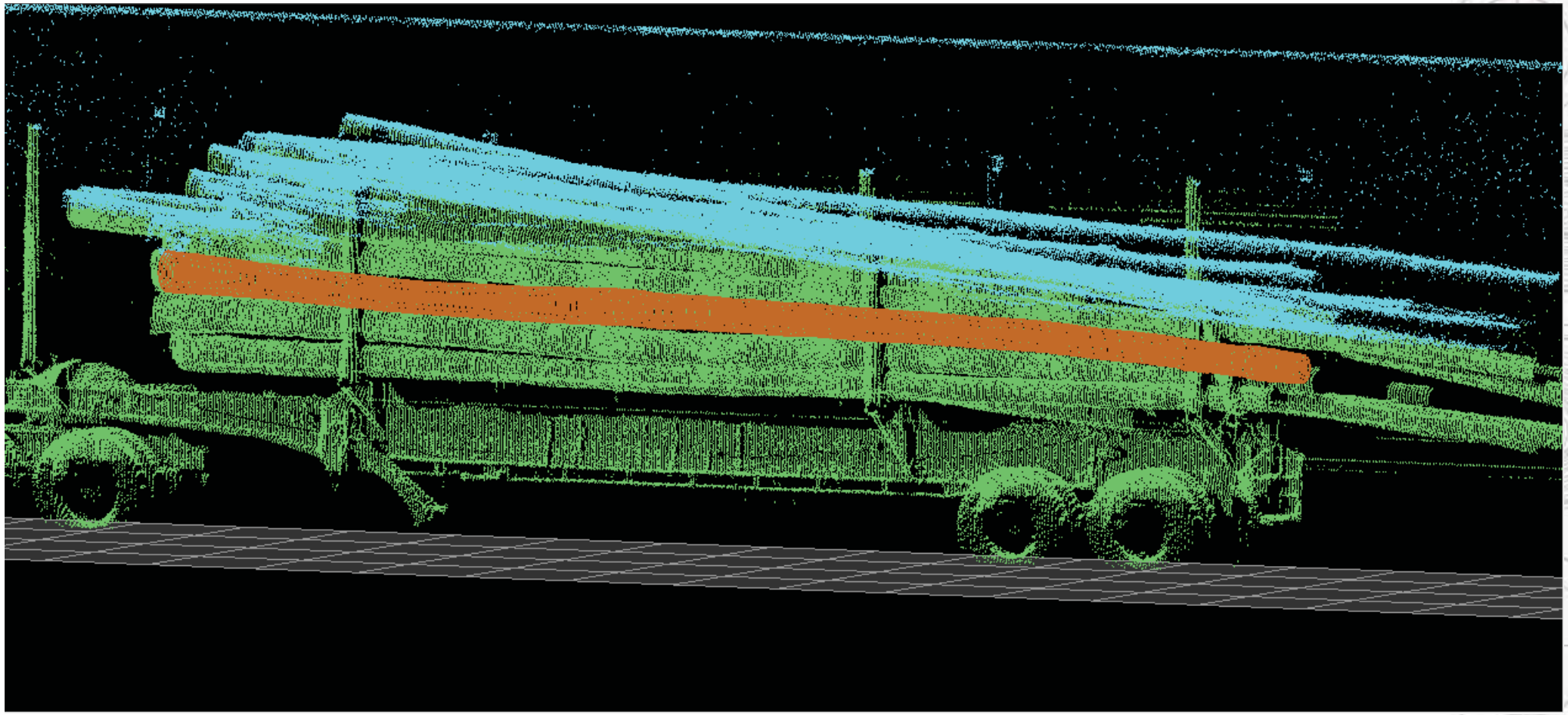
Defect	Count	% of Total Defects
Crook/Sweep	3,954	27.8%
Small SED	3,615	25.4%
Small LED	5,345	37.6%
Oversized LED	56	0.4%
Too Short	790	5.6%
Too Long	-	0.0%
Uneven Butt	422	3.0%
Split Butt	16	0.1%
Swelled Butt	10	0.1%
TOTAL	14,208	

Defects/load	5.6
Defects/log	19%
Logs on spec	81%

Big, Regular & CnS logs

Item		
Average SED	10	in
Average LED	15	in
Average Length	41	ft
Scanned Loads	3,182	loads
Total volume	1,330,273	cf

Automatic Undersize Length and Detection of Sweepy Logs & Taper



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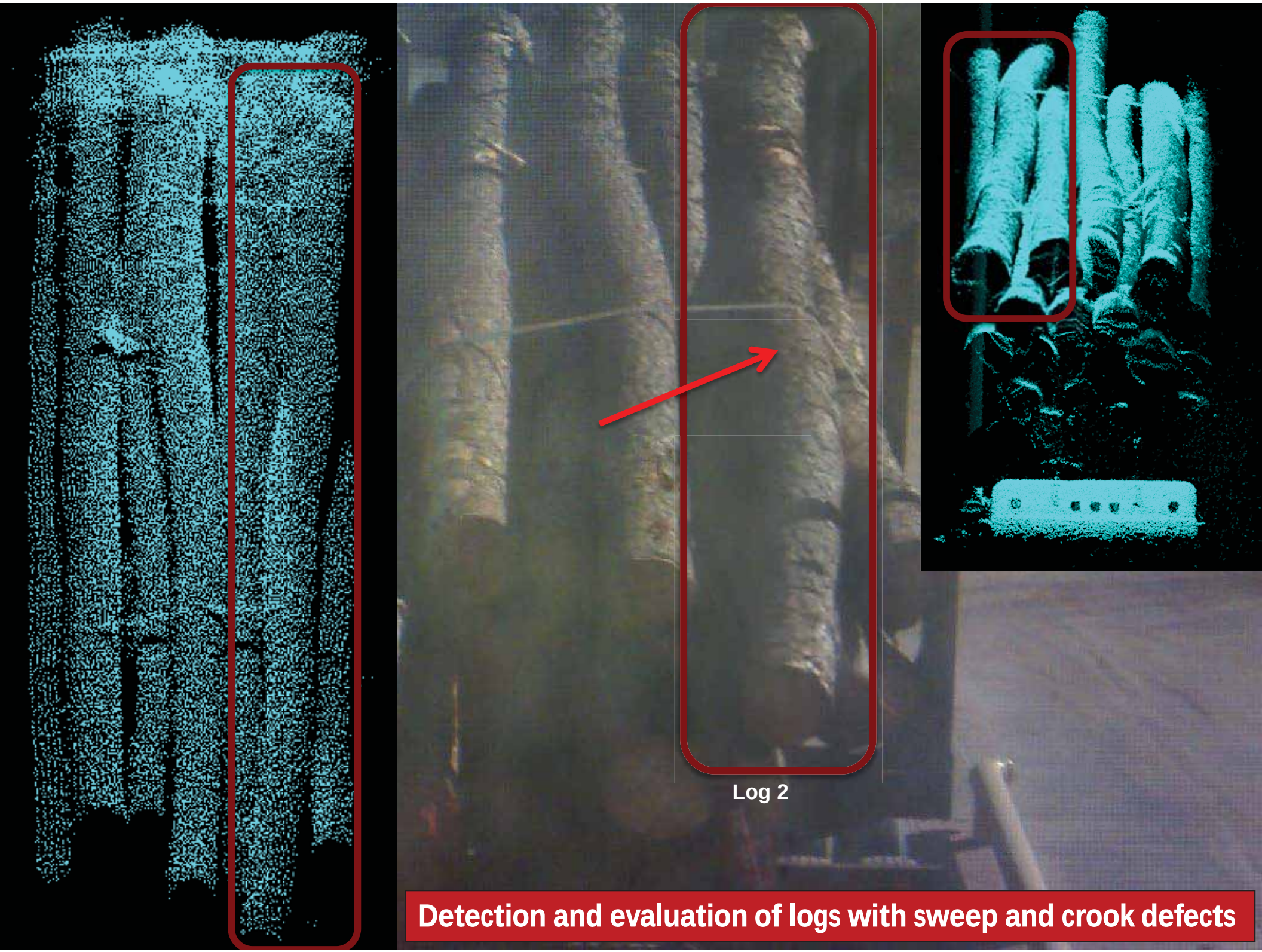
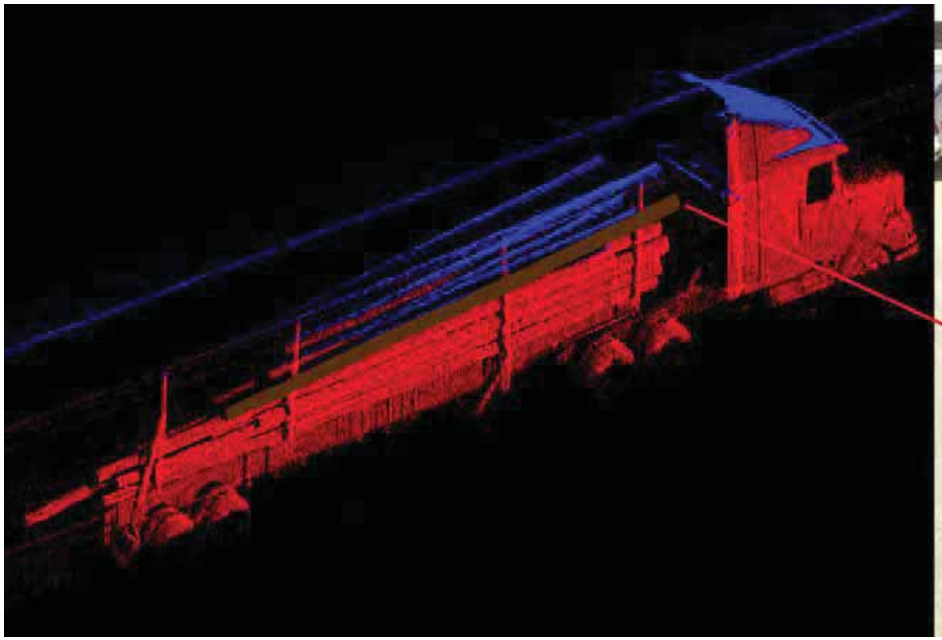

Log 2
Detection and evaluation of logs with sweep and crook defects

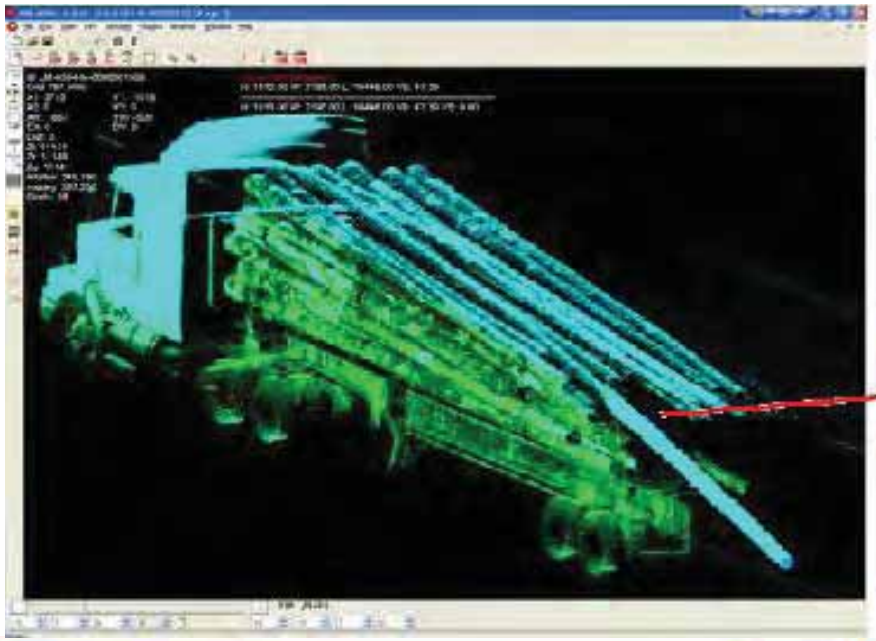
Length Measurement Test

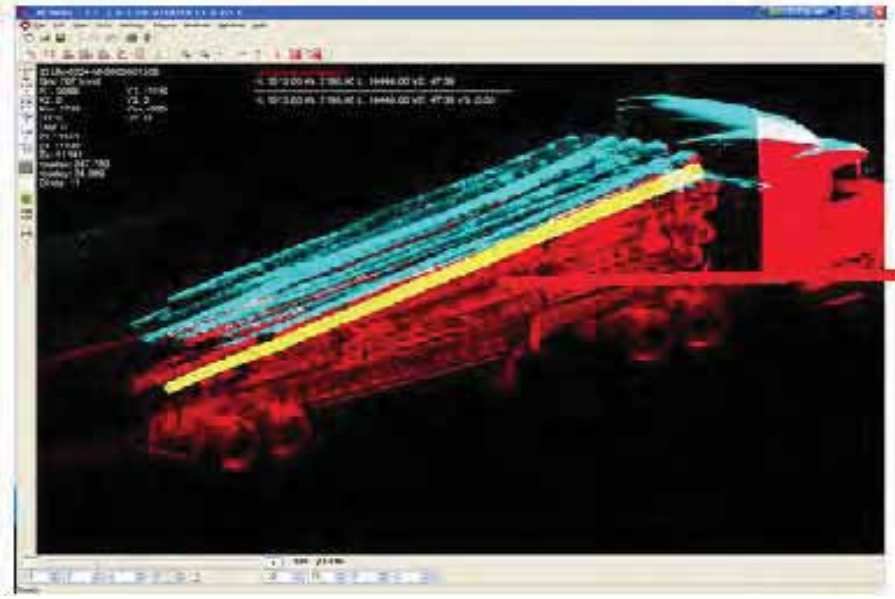


Logmeter Length
Measurement
34.36 feet

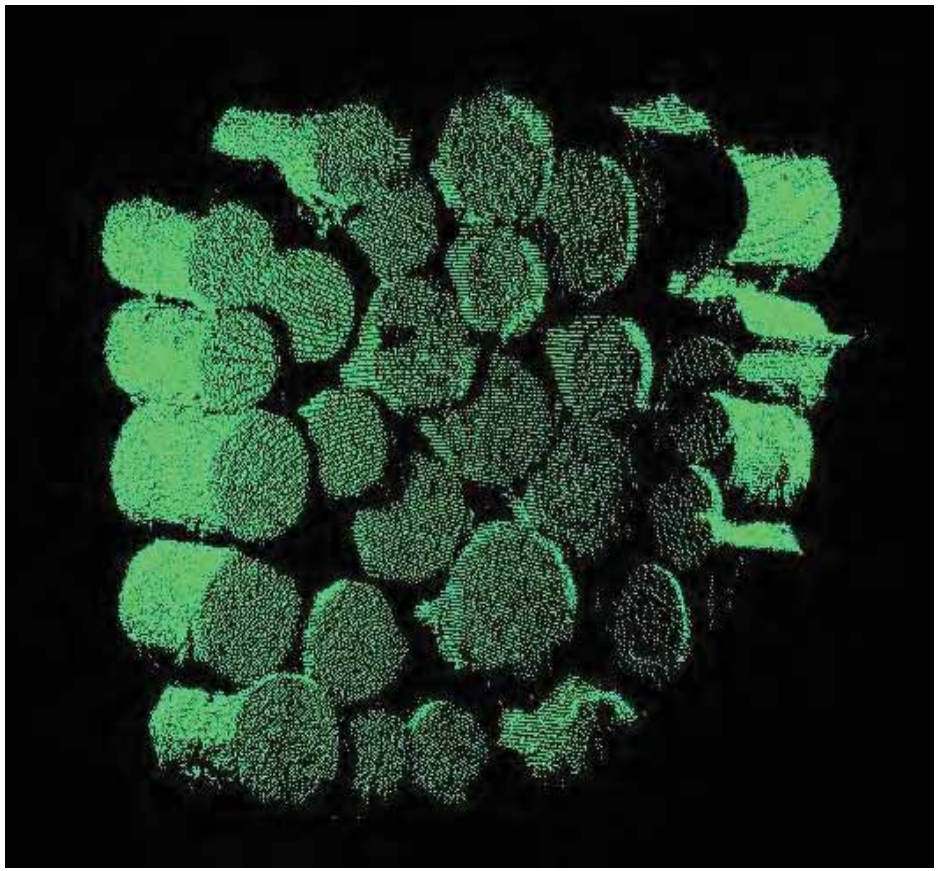
Manual Length
Measurement
34.20 feet

Automatic Undersize and Oversize Diameter Detection



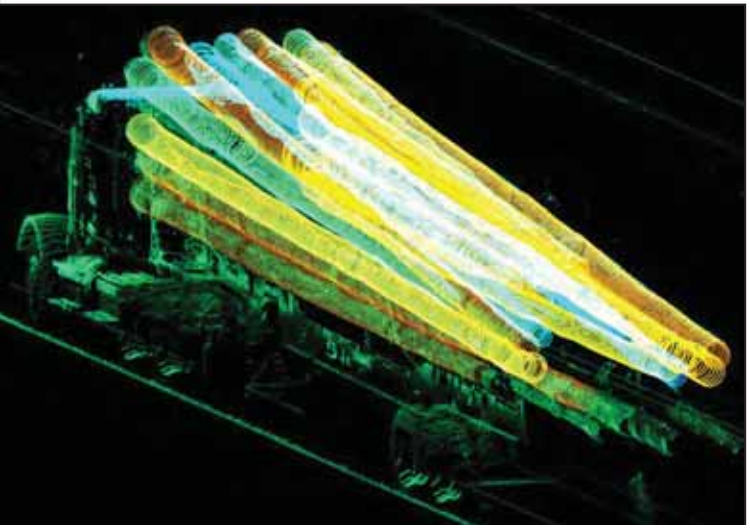


Diagonal Lasers



Using Woodtech's latest Scanning technology the Logmeter estimates precisely the number of logs and the diameter of logs per load.

Benefits



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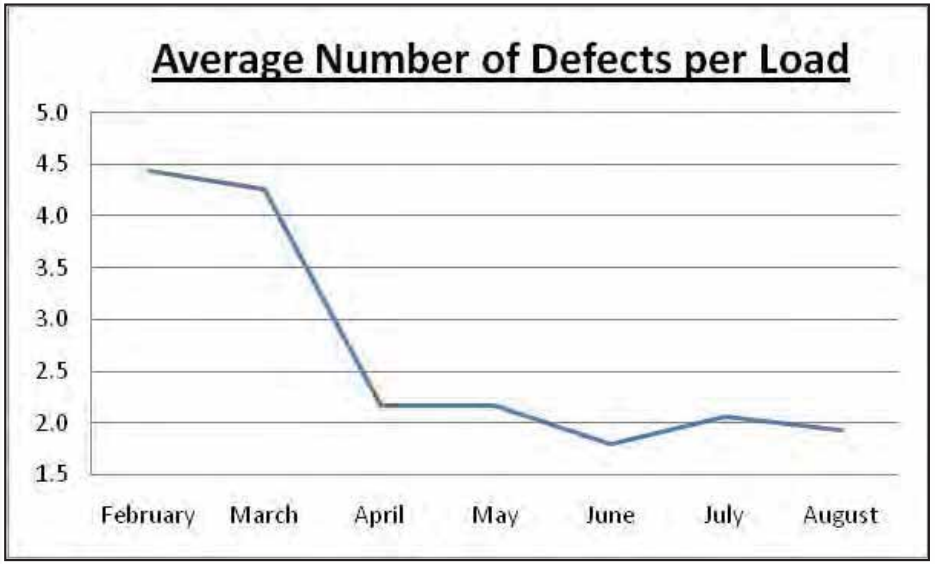
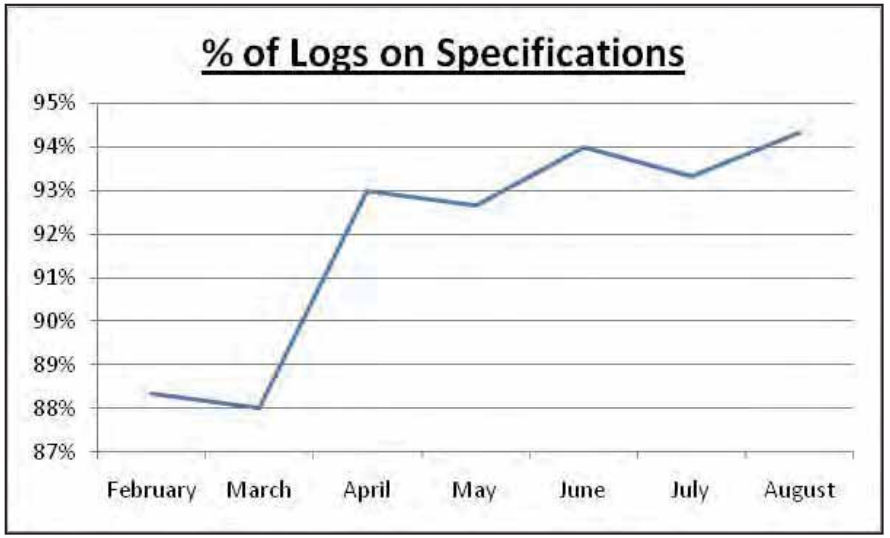
Log Quality Improvement





2011	Big Log		Regular		CNS		Average	
	Defects/load	Logs on Spec	Defects/load	Logs on Spec	Defects/load	Logs on Spec	Defects/load	Logs on Spec
February	5.4	82%	3.0	92%	4.9	91%	4.4	88%
March	5.7	81%	3.1	91%	4.0	92%	4.3	88%
April	2.6	89%	1.7	94%	2.2	96%	2.2	93%
May	2.5	89%	2.2	93%	1.8	96%	2.2	93%
June	1.9	91%	1.6	95%	1.9	96%	1.8	94%
July	2.0	91%	1.8	94%	2.4	95%	2.1	93%
August	1.7	93%	1.7	95%	2.4	95%	1.9	94%

Log Procurement Improvement

- Logmeter allows log buyers, suppliers and third parties to review each log transaction.
- Sawmill managers can identify good and bad suppliers

Large End Diameter (LED)				
Range [in]	Supplier A	Supplier B	Supplier C	Supplier D
<15	50%	43%	67%	0%
15-19	49%	55%	33%	48%
19-23	2%	2%	0%	40%
23-26	0%	0%	0%	10%
>26	0%	0%	0%	3%
Total	100%	100%	100%	100%

Small End Diameter (SED)				
Range [in]	Supplier A	Supplier B	Supplier C	Supplier D
<8	2%	5%	27%	0%
8-10	65%	54%	60%	10%
10-12	25%	37%	13%	36%
12-14	7%	4%	0%	33%
>14	1%	1%	0%	21%
Total	100%	100%	100%	100%

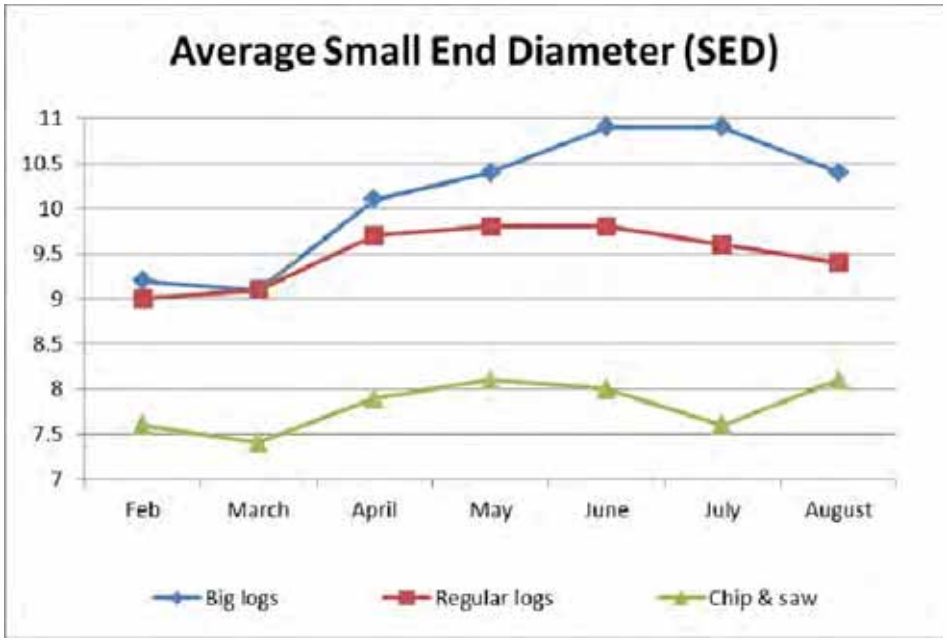
Log Procurement Improvement

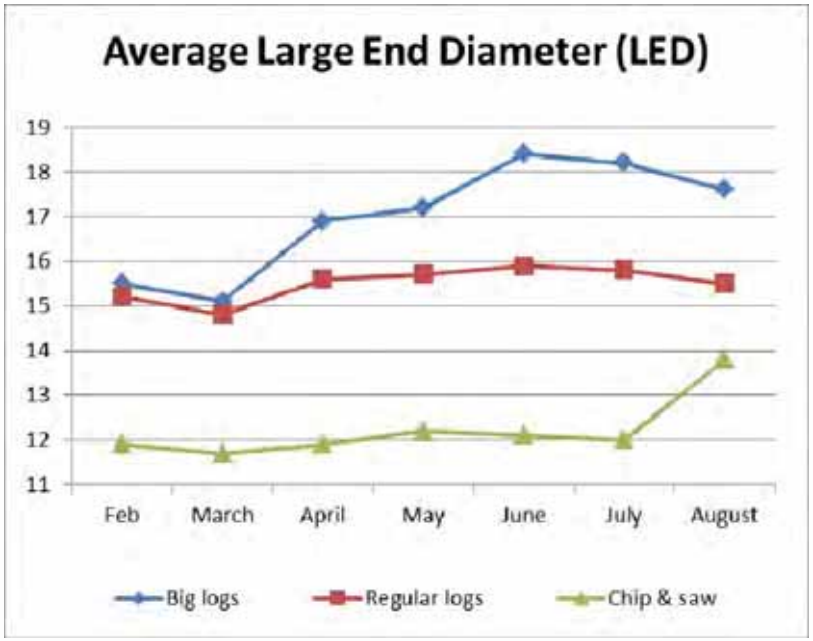
- Logmeter information allows to do load analysis by diameter, length, volume, location, supplier, driver, etc.
  - Mills know which suppliers bring best logs
  - Experience: Mill with Logmeter receives better logs than other mills within the area.

Land Owner	# of loads	Est. No. of stems	defects/log	defects/load	logs on spec
A	2	93	20.4%	9.5	79.6%
B	4	111	15.3%	4.3	84.7%
C	5	98	15.3%	3.0	84.7%
D	3	105	15.2%	5.3	84.8%
E	3	43	14.0%	2.0	86.1%
F	1	29	13.8%	4.0	86.2%
G	8	221	13.1%	3.6	86.9%
H	1	18	11.1%	2.0	88.9%
I	10	264	11.0%	2.9	89.0%
J	3	67	10.5%	2.3	89.6%

Log Quality Improvement = Productivity and Yield Improvement

Sawmills with Logmeter obtain bigger logs improving productivity and yield





Average SED (inches)	Feb	March	April	May	June	July	August	Feb - Aug Improvement
Big logs	9.2	9.1	10.1	10.4	10.9	10.9	10.4	13%
Regular logs	9.0	9.1	9.7	9.8	9.8	9.6	9.4	4%
Chip & saw	7.6	7.4	7.9	8.1	8.0	7.6	8.1	7%

Average LED (inches)	Feb	March	April	May	June	July	August	Feb - Aug Improvement
Big logs	15.5	15.1	16.9	17.2	18.4	18.2	17.6	14%
Regular logs	15.2	14.8	15.6	15.7	15.9	15.8	15.5	2%
Chip & saw	11.9	11.7	11.9	12.2	12.1	12.0	13.8	16%

Bucked Log SED (inches)	Industry Average Yield Log tons/MBF Lumber
< 8	5.0
8 - 10	4.5
10	4.0

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Better Inventory Management

- Greater certainty about inventory level
  - Less inventory variability
  - Detailed information about inventory logs
  - Updated Information
- Reduces risk of running out of logs
- Reduces cost of insurance and safety/winter log stock

Log inventory volume = Logs purchased - logs sold - logs used

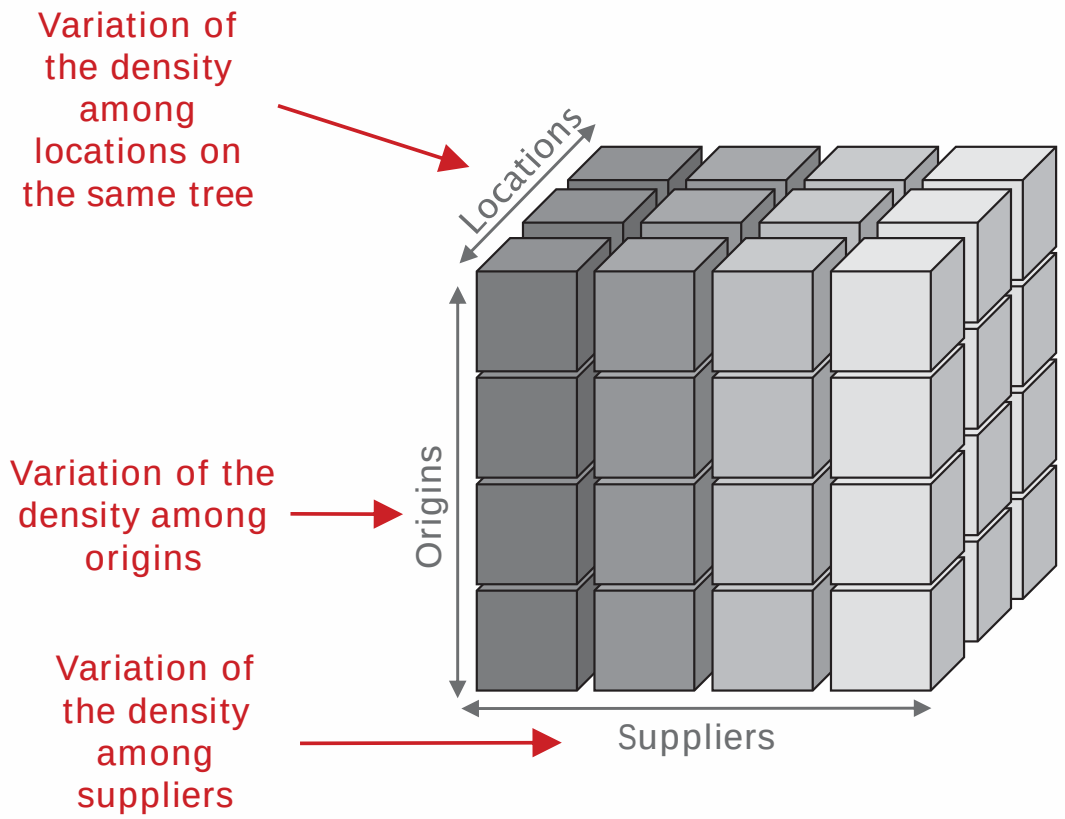
Better inventory control if all measured in Cubic Volume

Elimates Conversion Factor Error

- Eliminates error associated with converting weight to volume (Cubic)

Requires many conversion factors.

In practice: requires a high sampling rate.



Fraud Possibilities Reduction

- Semi Automatic system
- Watches/Controls/Measures all log deliveries
- Updates electronically all deliveries (diameter, length, volume, location, supplier, driver, etc.)

Source: The Chattanoogan

Rome Man Pleads Guilty In Multi-Million-Dollar Timber Fraud Scheme

posted November 3, 2010

A 50-year-old Rome, Ga., man on Tuesday pleaded guilty before Senior United States District Judge Robert L. Vining in federal district court to multiple charges relating to a **$4 million scheme** involving timber that did not exist.

A jury had been selected and Aaron Wilbert Freeman's trial was set to begin Wednesday when he decided to plead guilty.

United States Attorney Sally Quillian Yates said, "Paper is made from trees, but in this case, Freeman created trees out of paper. **He did so by manipulating his employer's computer system to create phony receipts for timber deliveries that never took place.** He also recruited timber truck drivers to redeem the fake receipts for payment, then laundered the proceeds through multiple financial institutions."

Lumber Sales Realization Improvement

Logmeter information allows managers to know what the mill is buying and receiving (SED, LED, Length, Volume and defects distributions) therefore managers project the lumber products those logs will produce (e.g. percentage narrow versus wide lumber) in order to manage lumber production and improve sales realization.

Lumber revenue and manufacturing costs depend on log characteristics.
Better logs = higher lumber revenue and lower manufacturing costs.

Logmeter = Management Tool

Wood Purchase

- Better relationship with suppliers
- Greater transparency –less human intervention
- Reduce truck waiting time & administrative time
- No dependency on conversion factors

Operation

- Production planning
- Log handling cost reduction and possibility of log damage, machinery breakdown and accidents.

Inventory

- Greater certainty about the inventory level
- Reduction in the risk of running out of stock
- Reduction in Safety Stock costs

Quality Control

- Better information about the quality of the wood received
- Better product received
- Greater efficiency

WOODTECH
MEASUREMENT SOLUTIONS

AN EXCELSYS COMPANY

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