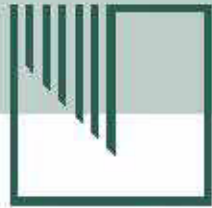


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THE GROWING ROLE OF EUCALYPTUS PULP IN TISSUE PRODUCTS


Ana Vianna
Chief Commercial Officer
Jari Celulose
Pará, Brazil
sales@jari.com.br
55 21 3687 7500

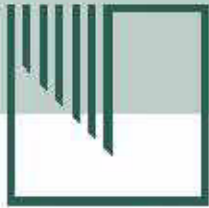
Tissue World 2003
Nice, France
March 2003



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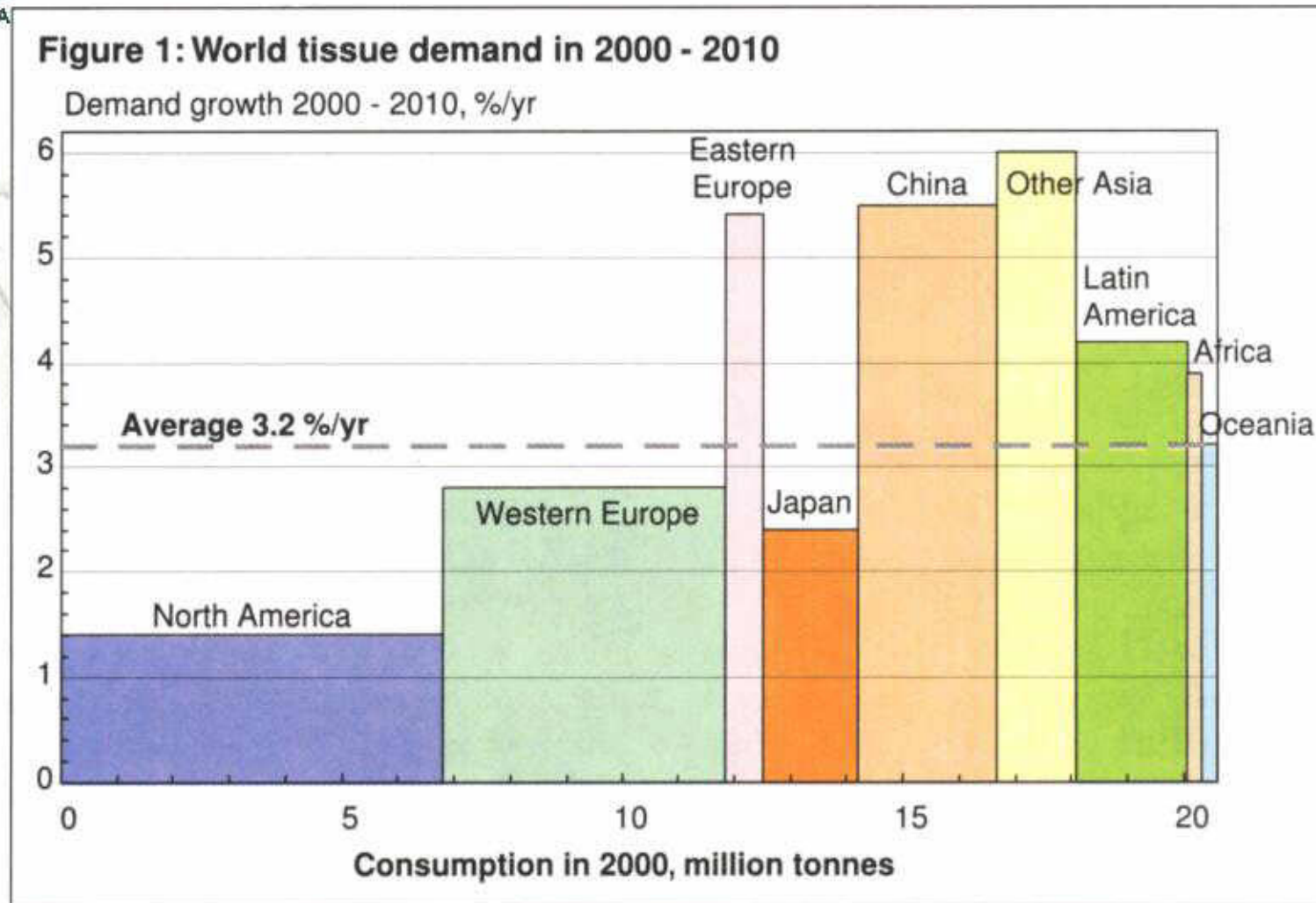
AGENDA

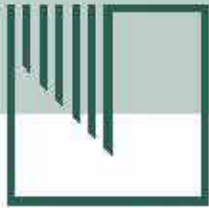
- 
- **MARKET PERFORMANCE AND PERSPECTIVES**
 - **BRAZILIAN EUCALYPTUS**
 - **QUALITY ATTRIBUTES**
 - **CONCLUSIONS**



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WORLD TISSUE DEMAND IN 2000 - 2010



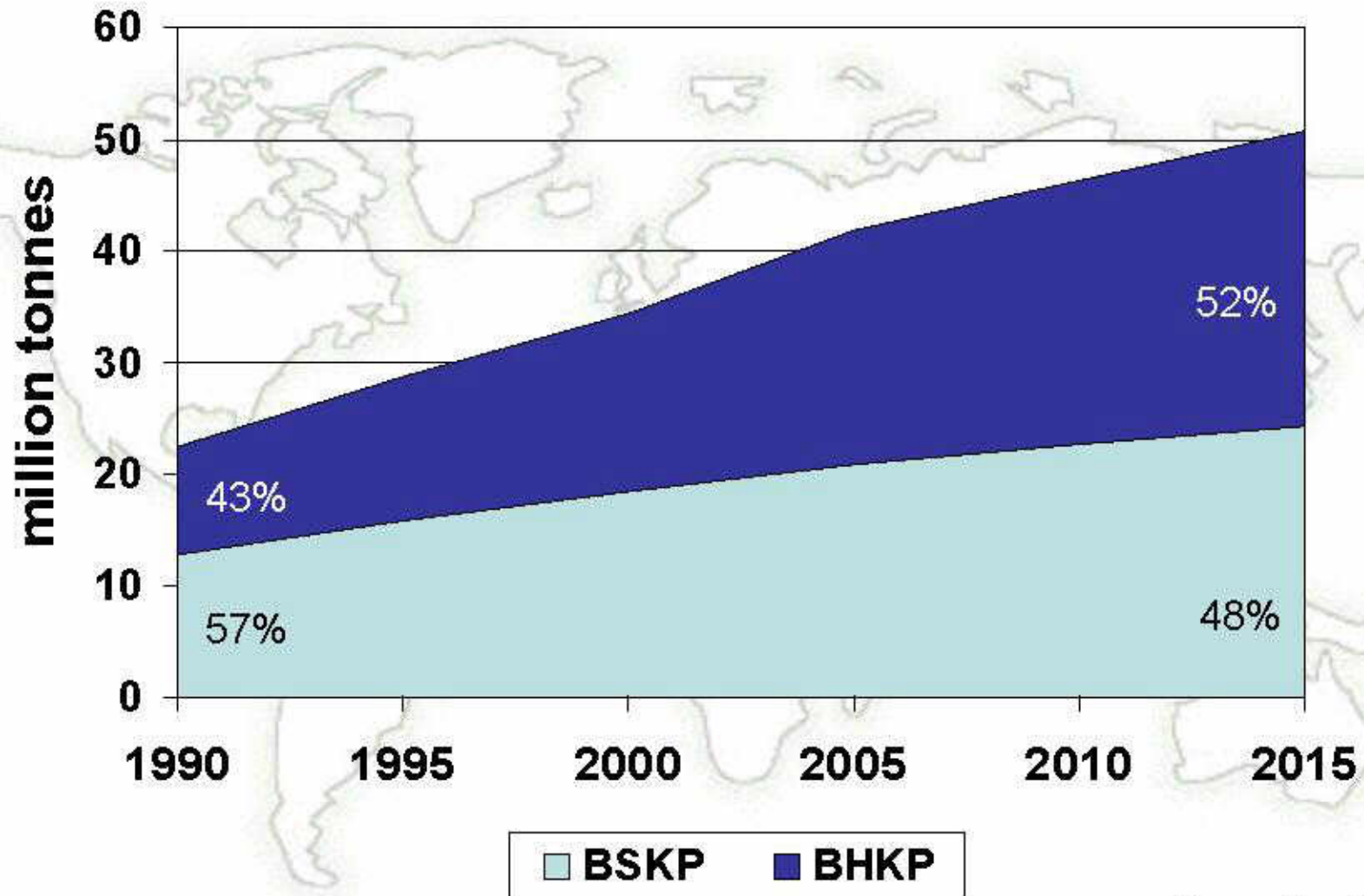


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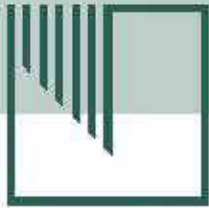
WORLD DEMAND – BHKP & BSKP

Real

Forecast

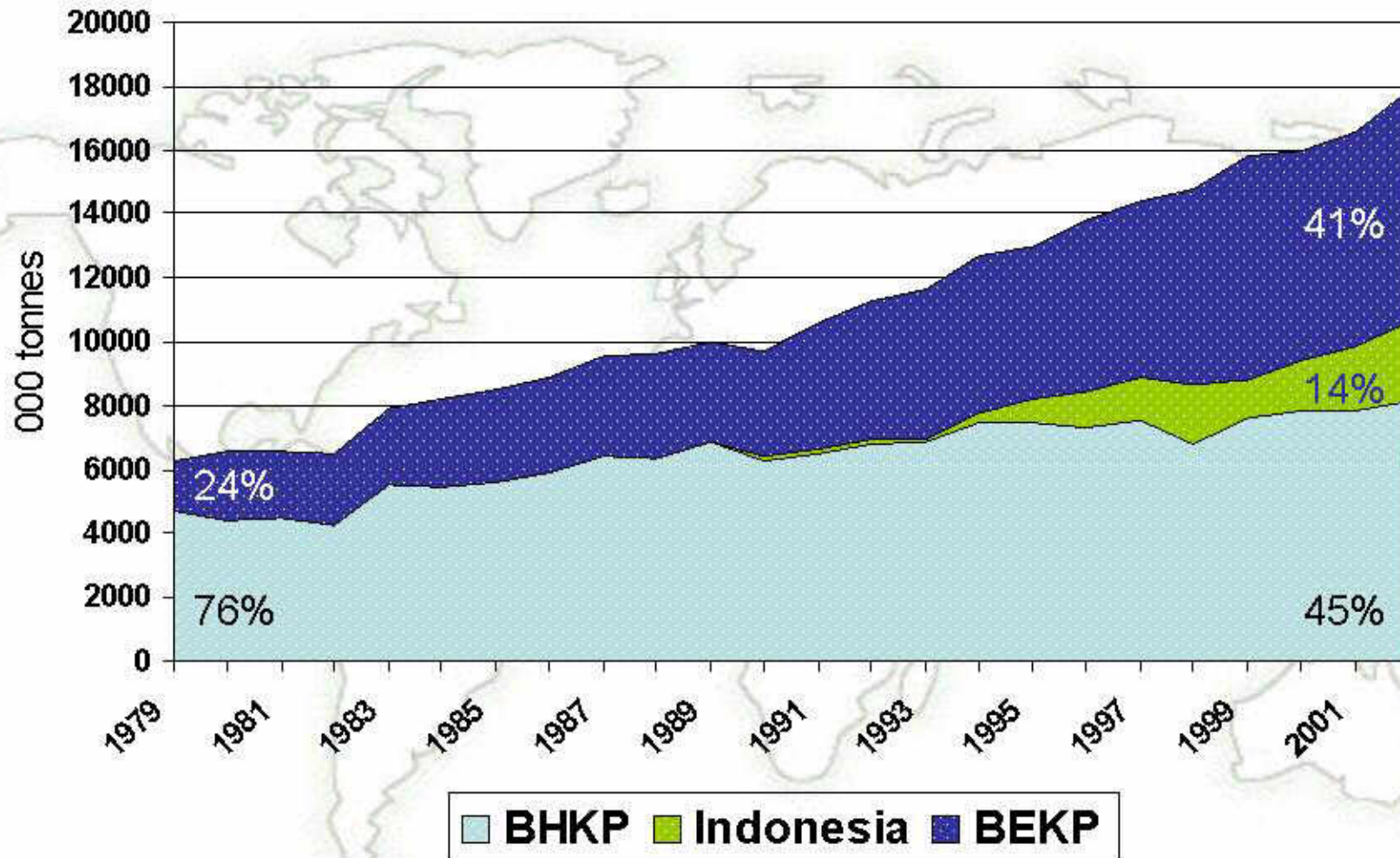


Source : Hawkins Wright

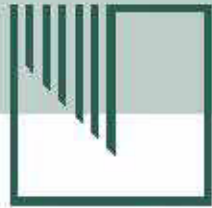


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WORLD DEMAND – BEKP and other BHKP



Source : Hawkins Wright

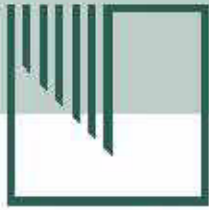


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FORECAST BEKP DEMAND

	Real		Forecast		
	2000	2002	2004	2006	% av.yr
North America	888	905	920	1000	2,1%
Europe	3745	3945	4204	4359	2,5%
Latin America	595	651	750	800	5,0%
Asia	1074	1016	1105	1306	3,4%
China	262	525	690	1200	28,8%
Total	6564	7042	7669	8665	4,7%

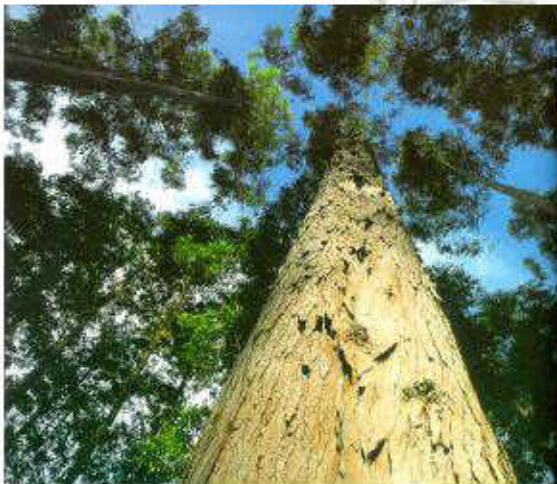
Source : Hawkins Wright

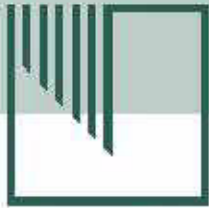


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EUCALYPTUS HISTORY

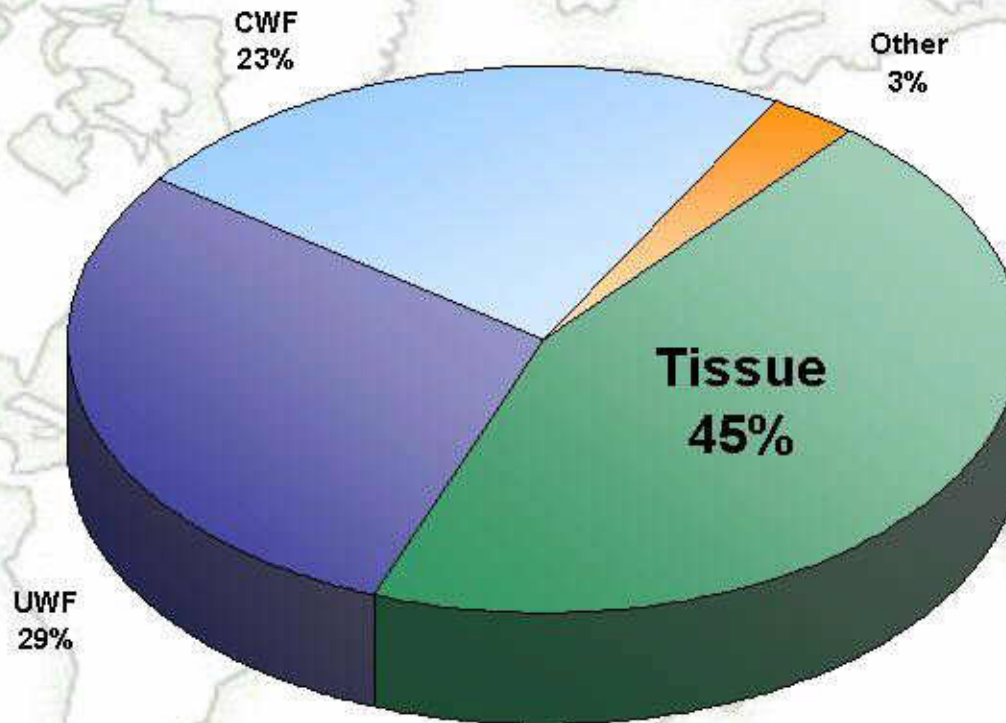
- 1903 – Eucalyptus is first planted for coal used in railways;
- 1949 – Eucalyptus is first planted for pulp;
- 1957– The first eucalyptus pulp unit was produced;
- 1980 – Eucalyptus gains Market Share of 30%;
- 2000 – Total of 980.000 ha of Eucalyptus planted in Brazil;



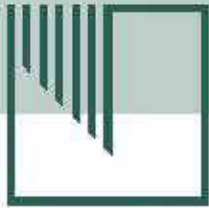


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“The eucalyptus industry dedicates 45% of its market pulp sales to the tissue segment”



Total BEKP demand = 6.7 million t in 2001



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TECHNOLOGICAL CHARACTERISTICS OF TISSUE

TISSUE

USUAL REQUIRED CHARACTERISTICS

TOWEL

High Dry and Wet Strength, High Bulk, and High Absorbency

SANITARY

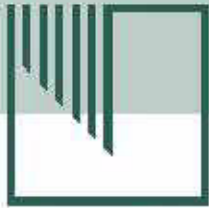
High Bulk and Good Hand feel

NAPKINS

High Dry Strength, High Bulk and Good Hand feel

FACIAL

High Dry Strength and Good Hand feel



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FIBER

TECHNOLOGICAL CHARACTERISTICS OF FIBERS

Technological Characteristics

SOFTWOOD

EUCALYPTUS

High Resistance

Handfeel, formation and Bulk

Handfeel

- High fiber counting per weight unit
- Low coarseness

Formation

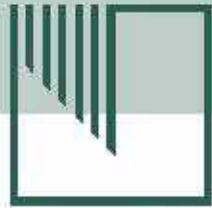
- Short fiber length
- High fiber counting per weight unit

Bulk

- High (wall thickness / fiber diameter) Index
- High (wall thickness / fiber length) Index
- High (fiber diameter / fiber length) Index
- Low (fiber lumen / fiber diameter) Index
- Low (fiber lumen / fiber length) Index



SOFTNESS



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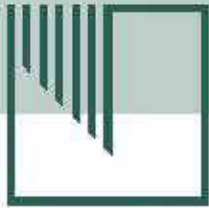
HOW IS SOFTNESS PERCEIVED?

▪ **Surface Softness**

- The surface softness has been accepted as the perception of softness obtained when the fingertips are lightly touched over the surface of the tissue sheet. It is mostly related to the fiber surface.

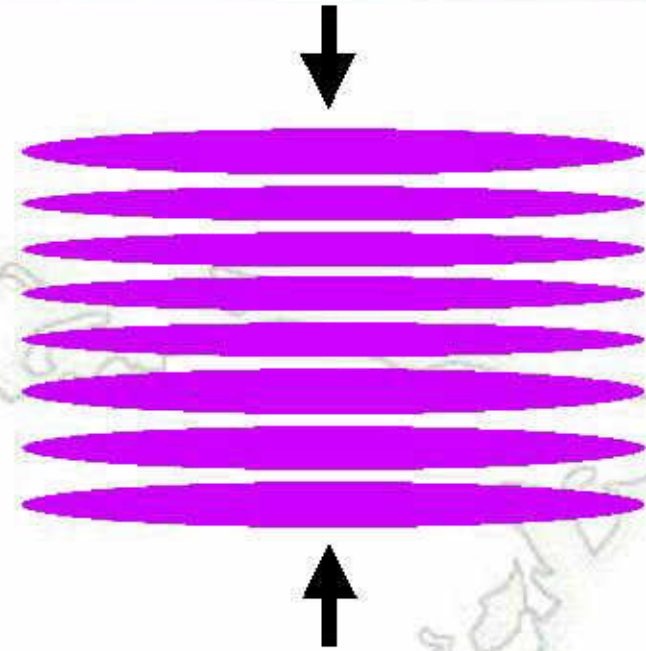
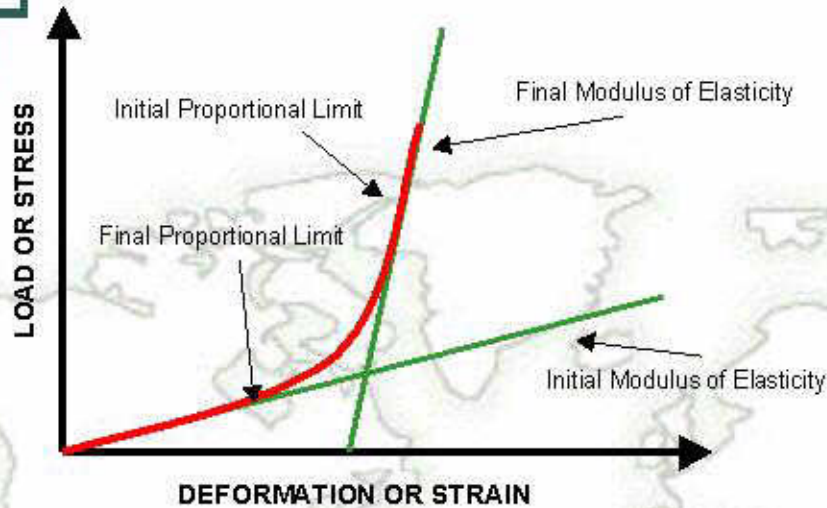
▪ **Bulk Softness**

- Accordingly, bulk softness definition has been commonly accepted as the perception of softness obtained when the hands crumple the tissue sample. Related to the fiber structure (Initial Modulus of Elasticity)

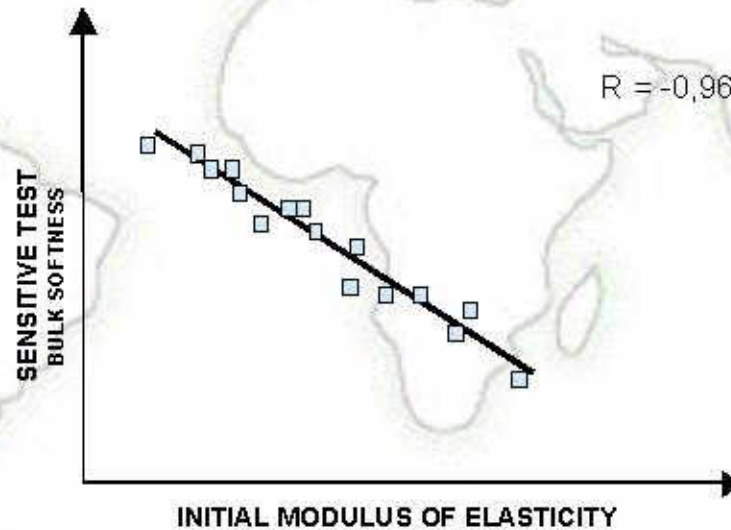


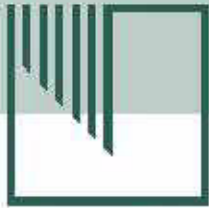
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STRESS-STRAIN RELATIONSHIP



INTERRELATION OF LOAD-DEFORMATION and SOFTNESS

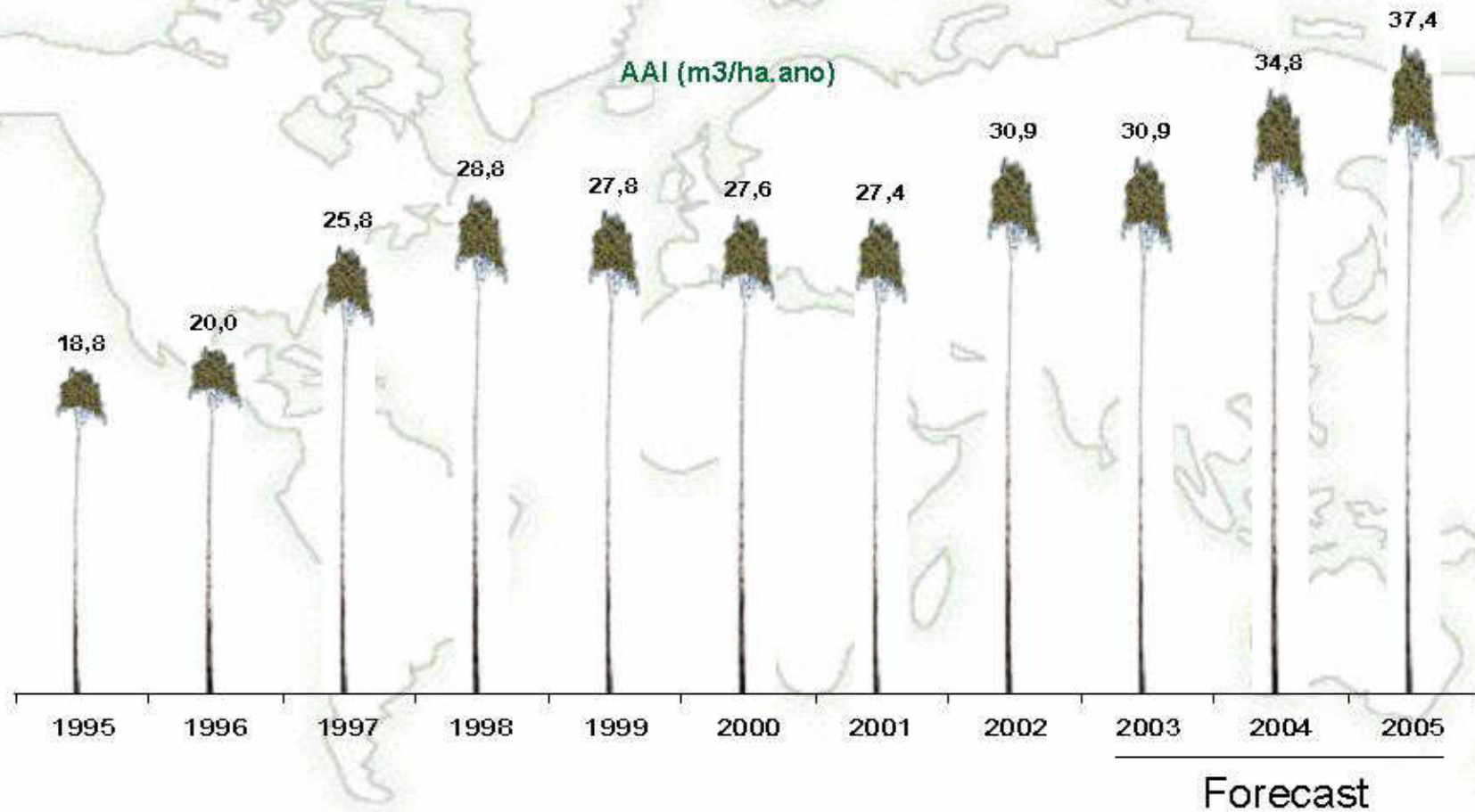


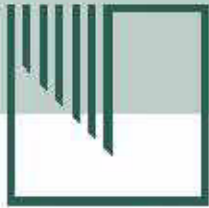


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FORESTRY IMPROVEMENTS

“The nature of the fiber has a **DIRECT** influence on the quality of the end product”



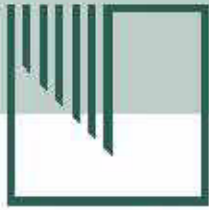


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WHO WE ARE...

Competitive Advantages

- Short cut cycle of 100% planted eucalyptus;
- Smallest forest-mill distance in Brazil;
- High productivity forests;
- Privileged geographical location;
- Private port adjacent to mill;
- Dedicates 90% of sales to export;
- 34% for tissue segment;
- Present in all 5 continents;
- Socially oriented company;



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JARI CELULOSE
100% ECF Brazilian eucalyptus pulp
330.000 tons

Tel. +55 21 3687 7500
Fax. +55 21 2512 3025

Our presentation can be downloaded at

www.jari.com.br

(Press Room)

