

# BEWEGING IN HOUT

*MOVEMENT IN TIMBER*

# Die oorsake van beweging in hout

## *The causes for movement in timber*

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- 1. Vogverlies deur uitdroging
- *Moisture loss by evaporation*
- 2. Struktuur van die hout (anatomie)
- *Wood structure (anatomy)*



# 1. VOGVERLIES / *MOISTURE LOSS*

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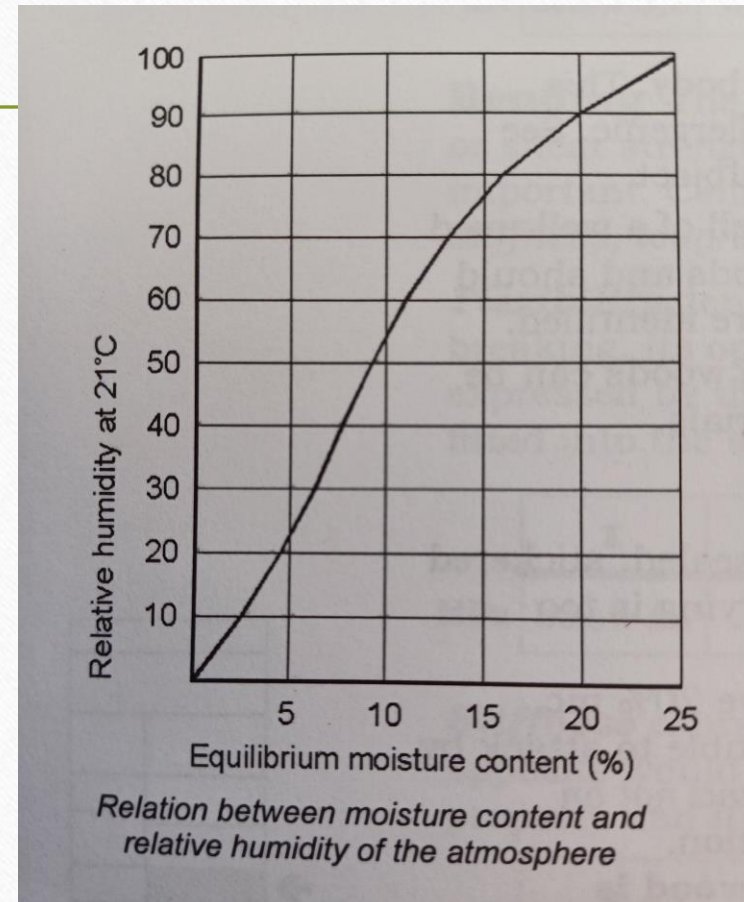
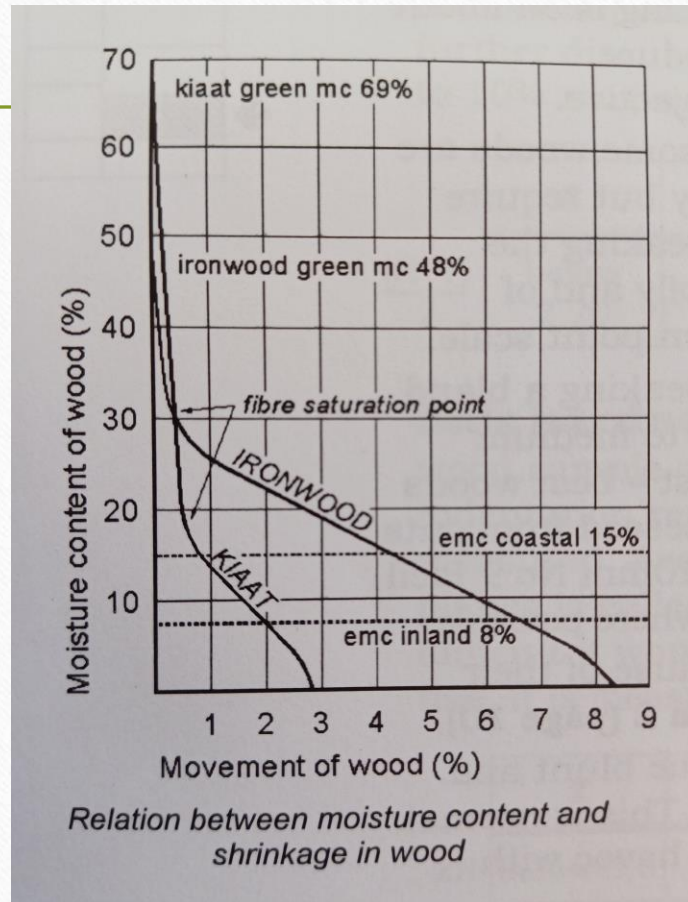
- Aspekte betrokke:

- 1. Voginhoud van hout
- 2. Ekwilibrium-voginhoud
- 3. Relatiewe humiditeit (lug)

- *Aspects involved:*

- *1. Moisture content of timber*
- *2. Equilibrium moisture content*
- *3. Relative humidity (air)*

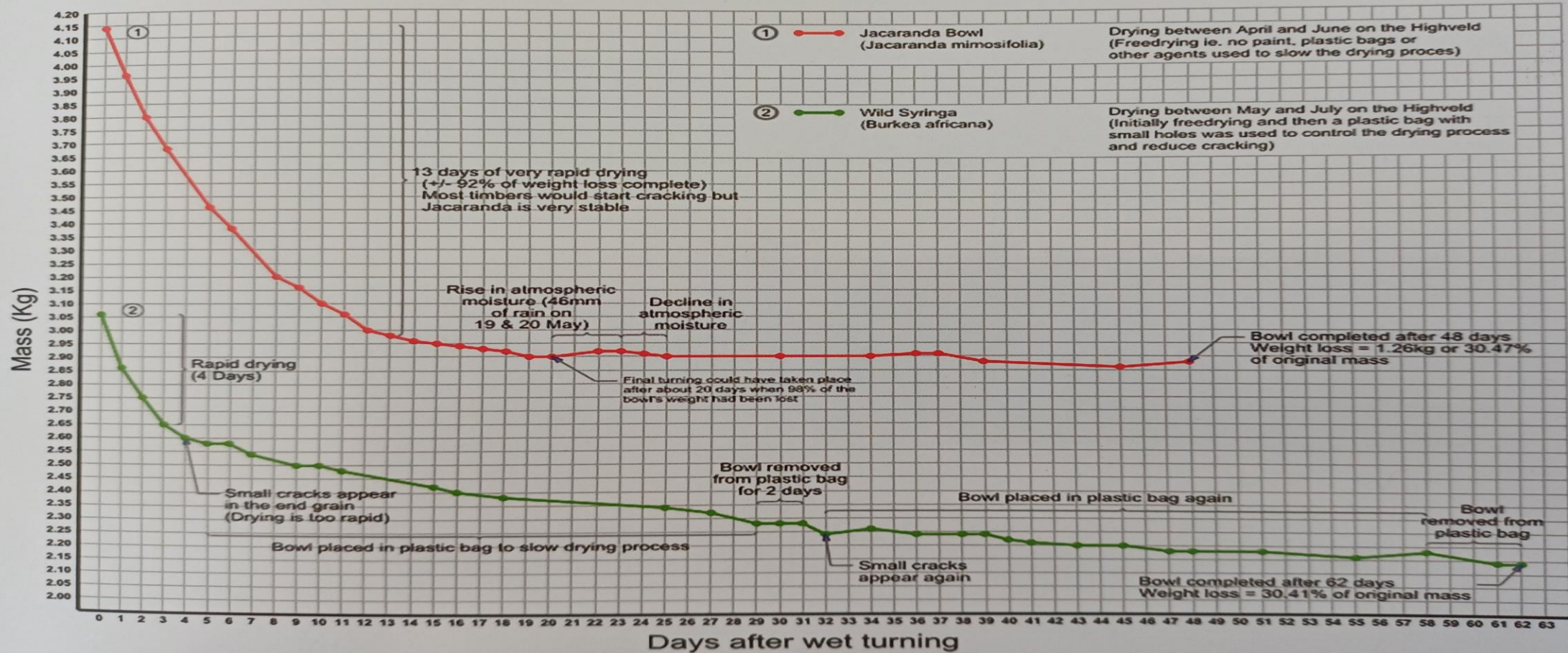
# BEWEGING IN HOUT / *MOVEMENT IN TIMBER*





# Grafiek deur Butch Smuts / Graph by Butch Smuts

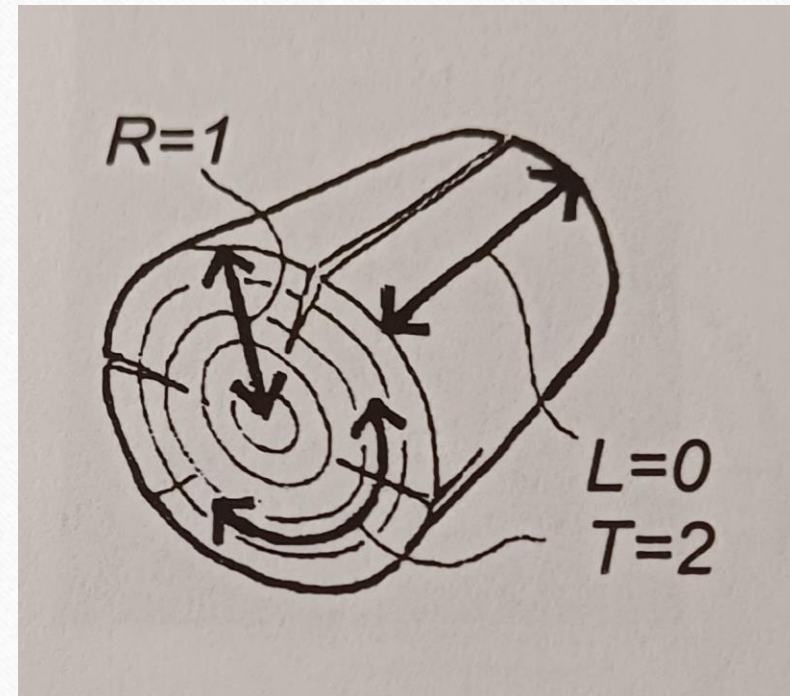
## Drying Curve For Two Wet Turned Bowls In Winter (Johannesburg, South Africa)





# KRIMPRIJTINGS / *SHRINKAGE*

- L = Lengte / oorlangse krimp
- *Lengthwise / longitudinal*
- R = Radiale krimp
- *Radial shrinkage*
- T = Tangensiale krimp
- *Tangensial shrinkage*





# HOUTKRIMPING / *WOOD SHRINKING*





## 2. HOUTANATOMIE *WOOD ANATOMY*

### XILEEM / *XYLEM*

Twee soorte selle – dun- en dikwandig

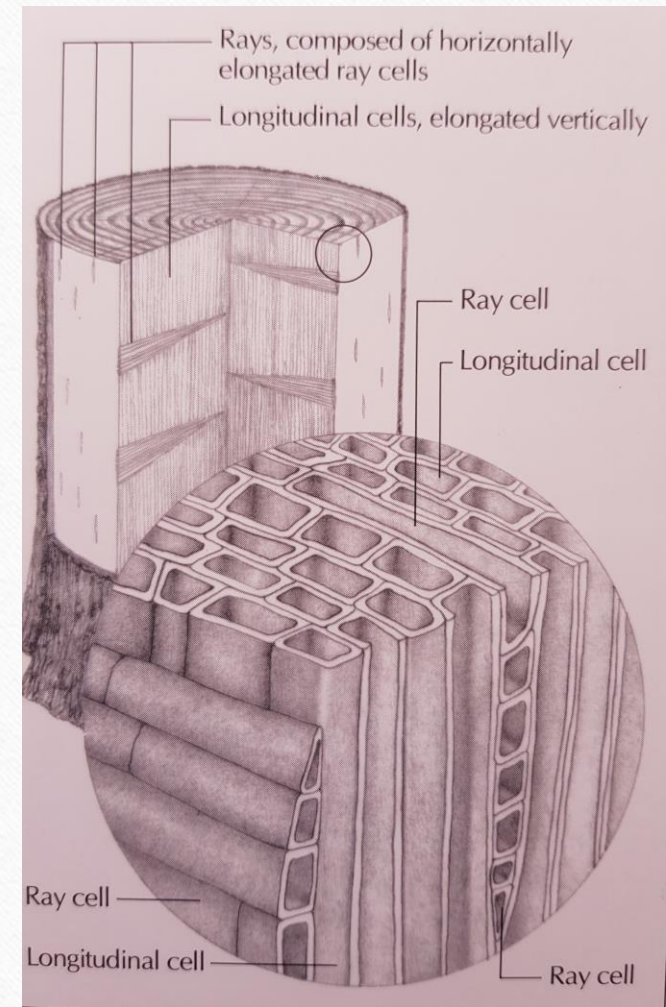
*Two cell types – thin and thick walled*

Dunwandig – slegs 'n primêre selwand

*Thin walled – only a primary wall*

Dikwandig – primêre + sek. wand

*Thick walled – primary + sec. wall*

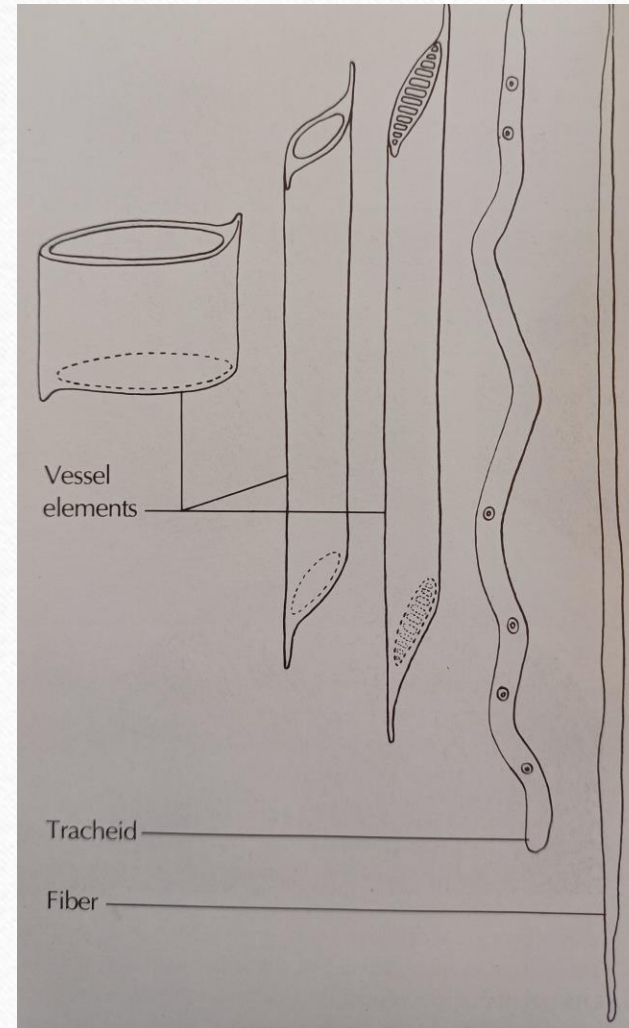




SOORTE  
DIKWANDIGE SELLE  
*TYPES OF THICK  
WALLED CELLS*

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1. Houtvatelemente / *Vessel elements*
2. Trageïede / *Tracheids*
3. Vesels / *Fibers*



# DIE VARIASIE IN TIPES HOUT

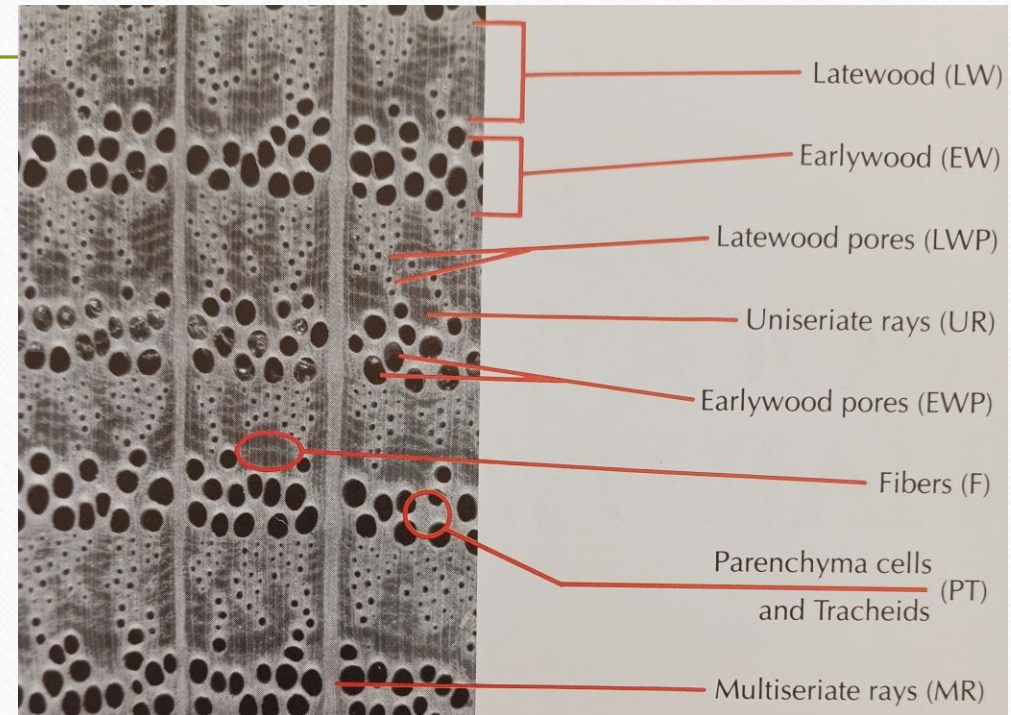
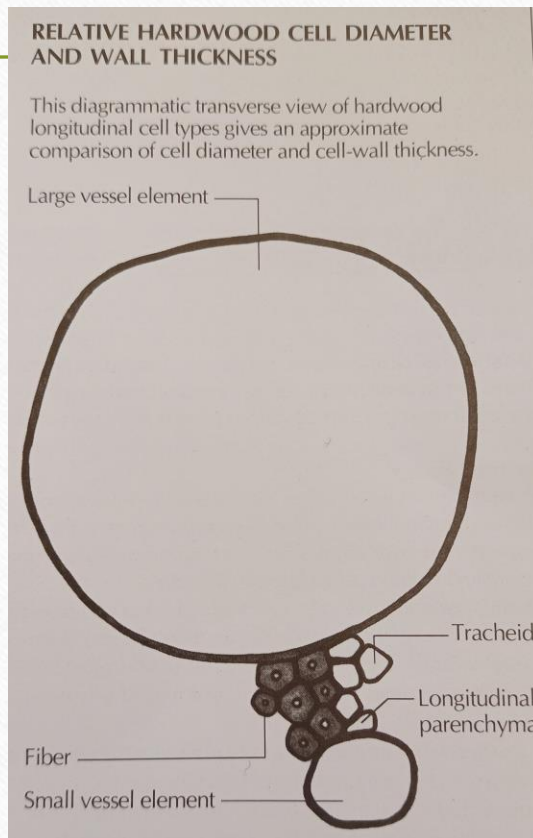
## *THE VARIATION IN WOOD TYPES*

- Verskille in houtsoorte is a.g.v. variasie in die verhouding tussen dun- en dikwandige selle en hulle relatiewe rangskikking in die xileem.
- *Different types of wood is the result of variation in the ratio of thin walled to thick walled cells and their relative arrangement in the xylem.*



# RANGSKIKKING VAN SELLE (TEKSTUUR)

## *CELL ARRANGEMENT (TEXTURE)*





GROEIRINGE EN WEEFSELRANGSKIKKING BY 10X VERGROTING  
GROWTH RINGS AND TISSUE ARRANGEMENT AT 10X ENLARGEMENT

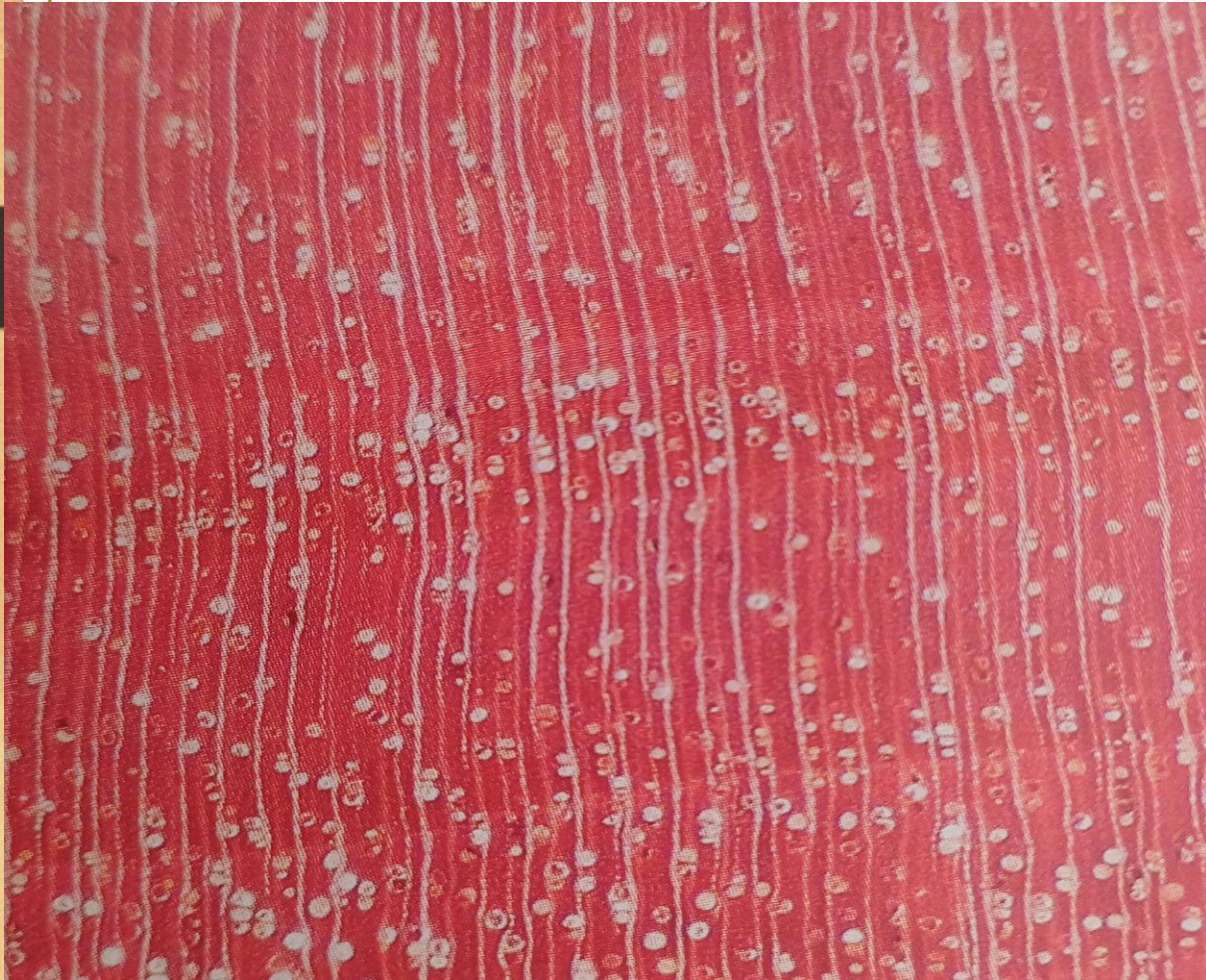
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# BY 40X VERGROTING / AT 40X ENLARGEMENT

- *Berchemia zeyheri* (Rooi-ivoor / Red Ivory)



- *Dalbergia melanoxylon* (Sebrahout / African Blackwood)





## XILEEMTEKSTUUR / *XYLEM TEXTURE*

- Die konstandheid in elke boom se xileem-samestelling is 'n geneties vasgelegde patroon, met min uitsonderings (o.a. afwykende diktegroei soos by knoetse en reaksiehout).
- *The xylem make-up of each tree is a genetically determined pattern with few exceptions (viz. abnormal thickening as in burls and reaction wood).*



# ANOMALE DIKTEGROEI / *ANOMALOUS THICKENING*





# DIGTHEID VAN HOUT / *DENSITY OF WOOD*

- Enkele mees beduidende kenmerk van hout.
  - Hoeveelheid sellulose, lignien en vesels per kubieke eenheid bepaal digtheid.
  - Verspreiding van hierdie seltipes bepaal die hout se tekstuur.
  - Digtheid word uitgedruk in massa (kg) per volume ( $m^3$ ).
- Single most significant property of wood.
  - Amount of cellulose, lignin and fibers per cubic unit determine density.
  - Distribution of these cell types determine texture of the wood.
  - Density is expressed as mass of the wood (kg) per volume ( $m^3$ ).



# VERWERKING VAN HOUT / *PROCESSING TIMBER*

- 1. Kabinetwerk gebruik hoofsaaklik gesaagde en gedroogde hout.

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- *Sawn and dried wood is necessary for cabinet work.*
- 2. Geoesde houtblokke word so vinnig moontlik gesaag en gedroog.
- *Commercially obtained wood is sawn and dried as soon as possible.*
- 3. Verskeie saagtegnieke en saagopsies word in die bedryf toegepas.
- *Several saw techniques and options are standard procedures.*

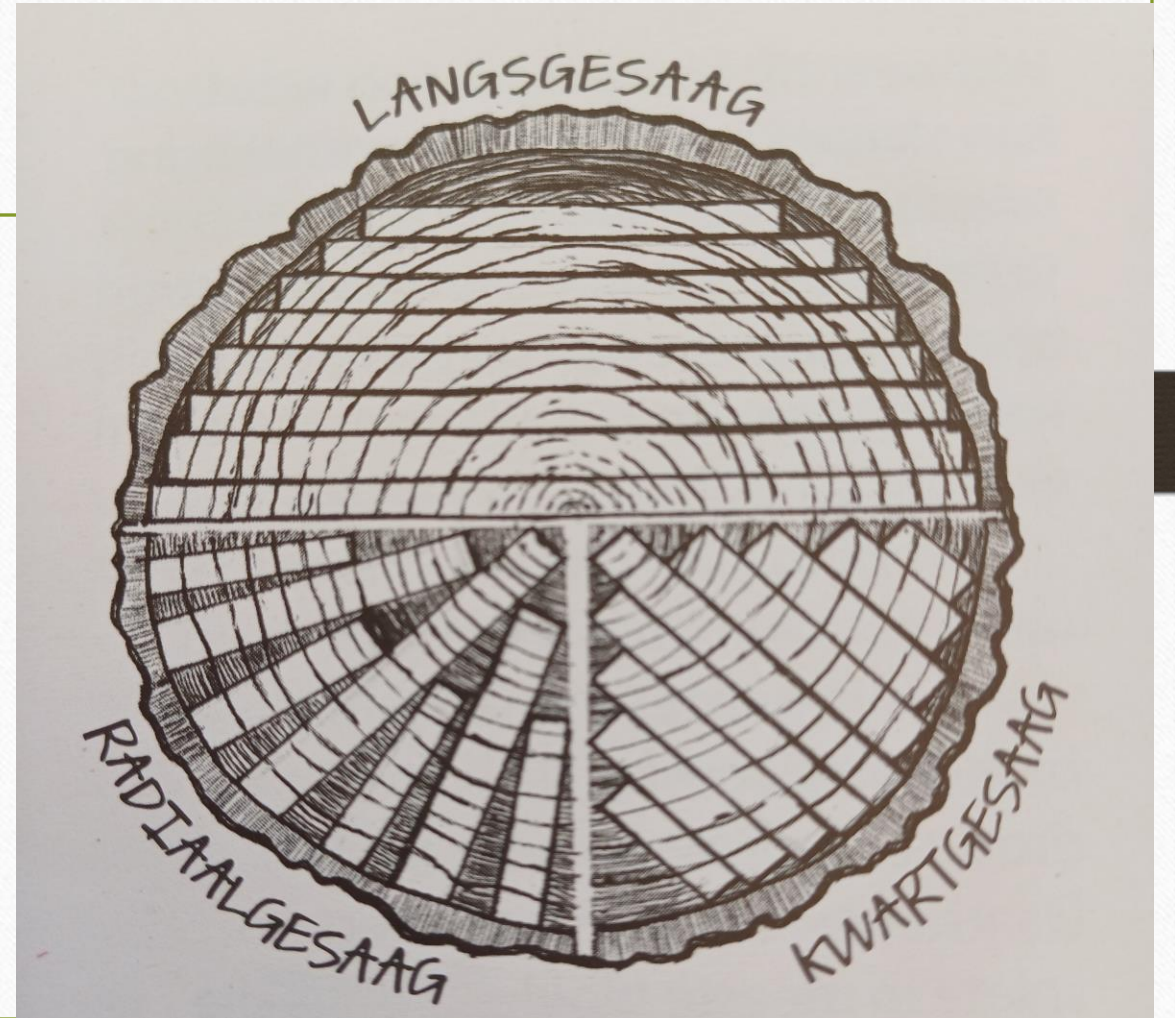


# SAAGOPSIES / *SAW OPTIONS*

- 1. Langsgesaag / tangensiaal gesaag

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- *Flatsawn / tangential-sawn*
- 2. Kwartgesaag / *Quarter sawn*
- 3. Radiaalgesaag / *Radial-sawn*



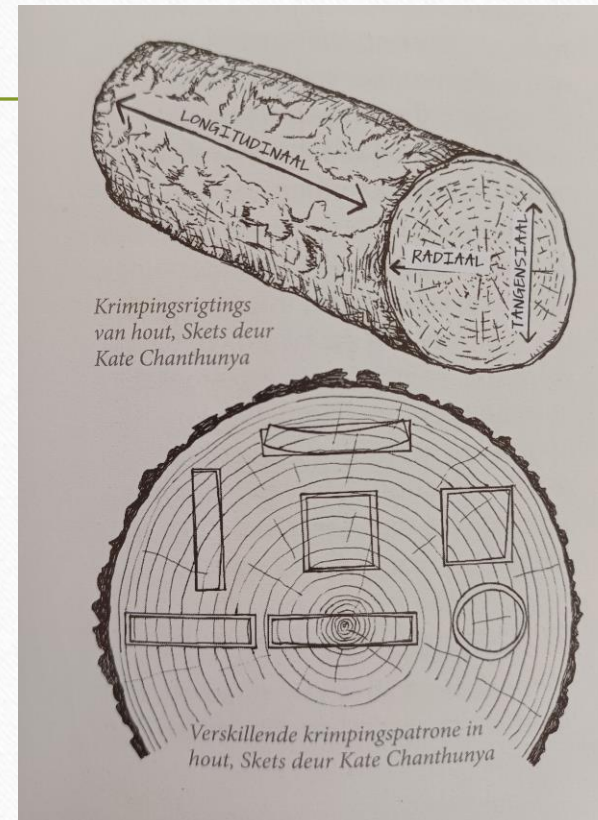


FIGUUR- EN GREINPATRONE / Langsgesaag  
*FIGURE AND GRAIN PATTERNS / Flatsawn*





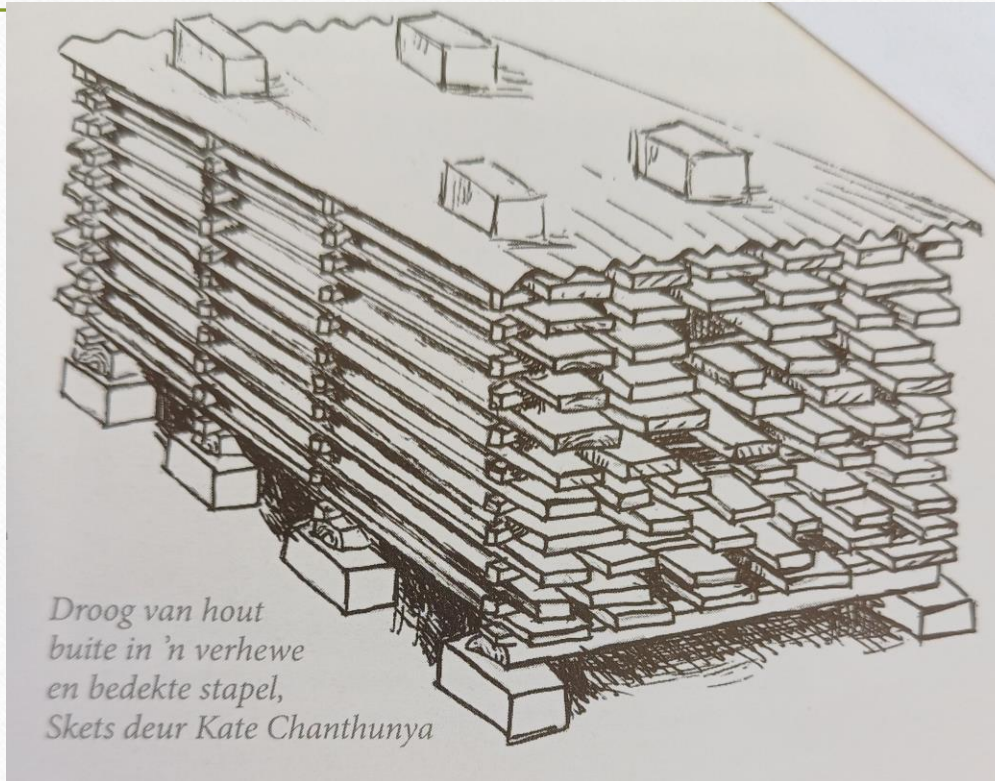
# KRIMPINGSPROBLEME / *SHRINKAGE PROBLEMS*





# STAPELTEGNIENK VIR LUGDROGING

## *STACKING FOR AIR SEASONING*





# Oondroging van gesaagde hout / Kiln drying of sawn lumber





