



Differences in wood trials between Norway spruce

Ilze Irbe, Uldis Grīnfelds,

Inese Šāble, Anrijs Verovkins,

Laura Vīķele, Baiba Horste,

Arnis Treimanis, Mārīte Škute,

Āris Jansons e.t.c.



Backgraund



Sample trees cut at age 21 in one site – Madona region

Wood used for analysis of the trunk from 0.5 to 1.3 meters in height from the ground.

Clone	Count of trees
26	3
31	4
A10	3
A15	3
A7	2
B10	3
B15	3
B6	4
KR13	3
V7	3
V9	3



INVESTMENT IN YOUR FUTURE

Materials and method







INVESTMENT IN YOUR FUTURE

Microscopy











		Sum of Squares	df	Mean Square	F	Sig.
Stem diameter	Between Groups	485,497	10	48,550	12,551	,000
	Within Groups	208,879	54	3,868		
	Total	694,377	64			
- Stem hight	Between Groups	124,090	10	12,409	10,145	,000
	Within Groups	66,050	54	1,223		
	Total	190,139	64			
Cellulose content	Between Groups	18,383	10	1,838	1,340	,233
	Within Groups	76,814	56	1,372		
	Total	95,196	66			
Extractives in wood	Between Groups	6,509	10	,651	9,086	,000
	Within Groups	4,011	56	,072		
	Total	10,520	66			
Late wood content	Between Groups	519,623	10	51,962	12,628	,000
	Within Groups	213,965	52	4,115		
	Total	733,588	62			
Density	Between Groups	86006,380	10	8600,638	19,605	,000
	Within Groups	23689,180	54	438,689		
	Total	109695,560	64			
Lignin in wood	Between Groups	22,467	10	2,247	5,794	,000
	Within Groups	21,716	56	,388		
	Total	44.184	66			

ANOVA





































26
31
A10
A15
A7
B10
B15
B6
KR-13
∨7
∨9

kloni











INVESTMENT IN YOUR FUTURE



		- Fiber length	– Fiber width	Runkel - I.w.	Runkel e.w.
Tensile index	Pearson Correlation	,185	-,117	-,305	-,645**
	Sig. (2-tailed)	,151	,364	,114	,000
	Ν	62	62	28	28
Burst index	Pearson Correlation	,150	,037	-,274	-,625**
	Sig. (2-tailed)	,243	,776	,158	,000
	Ν	62	62	28	28
Breaking length	Pearson Correlation	,203	-,110	-,315	-,650**
	Sig. (2-tailed)	,114	,396	,102	,000
	Ν	62	62		

Runkel ratio = 2x fiber wall thickness / lumen diameter













Conclusion



1. More wood produce 26, 31, B10, V7 Sitka spruce clones

2. Kraft pulp yield doesn't differ significant, but more pulp is possible to produce from clone #26.

3. No significant differences found in fiber length, but is found significant differences in fiber width between clones

4. Is significant difference in paper tensile strength between Ax and Bx spruce clones. Bx shows higher results compare to Ax.

5. Fiber morphology microscopy measurments shows, that Runkel ratio in earlywood effect mechanical properties than fiber latewood.

