

# C A M C O R E

## ANOVA AND MULTIPLE COMPARISONS FOR PROVENANCE AND FAMILY VOLUME

### FIVE YEAR MEASUREMENTS

TEST IDENTIFICATION: 13-01-11E  
SPECIES: Pinus tecunumanii - High elevation  
COMPANY: ARACRUZ Florestal  
SITE NAME: Santa Tereza  
ELEVATION: 650 - 900 m  
ANNUAL PRECIPITATION: 1500 - 1700 mm

DATE PLANTED: August 1984  
DATE MEASURED: November 1989

### ANALYSIS OF VARIANCE

DEPENDENT VARIABLE: Five Year Volume (cubic meters)

<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>F</u> <u>VALUE</u>
REP	6	0.13067461	20.94 **
PROV	5	0.00705557	1.36 ns
REP*PROV	30	0.03120795	5.12 **
FAM(PROV)	23	0.01097987	2.35 **
REP*FAM(PROV)	138	0.02801562	0.88 ns
ERROR	870	0.20070589	
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CORRECTED TOTAL	1072	0.43162651	

ns: Not significant

\*\* Significant at  $p < .01$

TEST MEAN  
0.03175 m<sup>3</sup>

C.V. (%)  
47.84

## \*\*\*\*\* MEANS BY PROVENANCE \*\*\*\*\*

The Waller-Duncan multiple comparison procedure shows no significant differences among the mean provenance volumes.

<u>Provenance</u>	<u># Trees</u>	<u>% Survival</u>	<u>Mean Height (m)</u>	<u>C.V. (%)</u>	<u>Mean D.B.H. (cm)</u>	<u>Tree Volume (cubic m)</u>
La Soledad	40	95.24	8.0	23.75	11.2	0.03583
* Control 202	41	97.62	7.9	26.50	11.0	0.03506
San Jeronimo	283	84.23	7.8	21.36	11.2	0.03451
San Vicente	196	93.33	7.9	18.14	11.0	0.03227
San Lorenzo	251	85.37	7.4	22.92	10.6	0.03017
Celaque	264	89.80	7.5	21.60	10.5	0.02878

Provenance code: 3 = La Soledad, Guatemala  
 5 = San Jeronimo, Guatemala  
 6 = San Lorenzo, Guatemala  
 7 = San Vicente, Guatemala  
 8 = Celaque, Honduras

\* Control lot: 202 = P. tec., Commercial control, Mt. Pine Ridge, Belize

## \*\*\*\*\* MEANS BY FAMILY \*\*\*\*\*

<u>Fam</u>	<u>Prov</u>	<u># Trees</u>	<u>% Surv</u>	<u>Mean Height (m)</u>	<u>C.V. (%)</u>	<u>Mean D.B.H. (cm)</u>	<u>Tree Volume (cubic m)</u>
84	5	40	95.24	8.2	21.10	12.1	0.04069
86	5	31	73.81	8.1	19.12	11.8	0.03980
73	6	32	76.19	7.9	20.48	11.2	0.03717
15	5	38	90.48	7.9	19.12	11.7	0.03597
195	7	40	95.24	8.0	20.59	11.7	0.03591
144	3	40	95.24	8.0	23.75	11.2	0.03583
1	6	38	90.48	8.0	21.94	11.3	0.03510
202	*	41	97.62	7.9	26.50	11.0	0.03506
193	7	34	80.95	7.9	18.30	11.3	0.03481
37	5	34	80.95	7.9	25.95	10.6	0.03425
31	5	35	83.33	7.5	19.05	11.3	0.03400
263	8	39	92.86	8.0	19.03	11.1	0.03348
272	8	38	90.48	7.7	19.19	11.4	0.03256
89	7	42	100.00	8.1	18.90	10.7	0.03201
85	7	39	92.86	8.0	14.24	11.0	0.03142
3	6	27	64.29	7.6	15.49	11.3	0.03091
18	5	39	92.86	7.6	28.89	10.4	0.03077
10	5	37	88.10	7.5	17.22	11.0	0.03030
12	6	33	78.57	7.3	26.28	10.4	0.02996
35	5	29	69.05	7.6	15.12	11.1	0.02954
269	8	38	90.48	7.6	23.17	10.2	0.02802
97	7	41	97.62	7.7	18.48	10.4	0.02778
267	8	30	71.43	7.6	19.83	10.1	0.02775
77	6	40	95.24	7.5	21.26	10.2	0.02770
44	6	40	95.24	6.8	30.36	10.1	0.02736
275	8	40	95.24	7.2	24.71	10.3	0.02707
262	8	40	95.24	7.2	18.64	10.3	0.02637
283	8	39	92.86	7.3	25.30	10.0	0.02614
72	6	41	97.62	7.2	19.38	10.1	0.02497

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OVERALL	1034	87.93	7.7	21.42	10.9	0.03161
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Note: Tree volume with bark was calculated using a formula for juvenile trees: Volume (cubic meters) =  $0.0003 \cdot D^2 \cdot H$ , where D=DBH in centimeters and H = total height in meters.  
The overall values do not include control lots.