

C A M C O R E

ANOVA AND MULTIPLE COMPARISONS FOR PROVENANCE AND FAMILY VOLUME

FIVE YEAR MEASUREMENTS

TEST IDENTIFICATION: 13-06-06B
SPECIES: Pinus tecunumanii - High elevation
COMPANY: EMBRAPA
SITE NAME: Felixandia
LATITUDE: 18° 45' S
LONGITUDE: 44° 53' W
ELEVATION: 614 m
ANNUAL PRECIPITATION: 1220 mm

DATE PLANTED: December 1984
DATE MEASURED: December 1989

ANALYSIS OF VARIANCE

DEPENDENT VARIABLE: Five Year Volume (cubic meters)

<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>F VALUE</u>
REP	8	0.02115156	2.59 *
PROV	5	0.04838478	9.47 **
REP*PROV	40	0.04088284	1.71 **
FAM(PROV)	28	0.05959561	3.56 **
REP*FAM(PROV)	210	0.12558836	1.61 **
ERROR	1253	0.46499889	
<hr/>			
CORRECTED TOTAL	1544	0.80095650	

* Significant at $p < .05$

** Significant at $p < .01$

TEST MEAN
0.03566 m³

C.V. (%)
54.03

***** MEANS BY PROVENANCE *****

WALLER-DUNCAN MULTIPLE COMPARISONS FOR FIVE YEAR PROVENANCE VOLUME

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

<u>Waller</u>	<u>Grouping</u>	<u>Mean</u>	<u>N</u>	<u>Provenance</u>
	A	0.04598	340	Montebello
	A			
B	A	0.04380	45	* Control 200
B	A			
B	A	0.04103	52	* Control 405
B				
B		0.03766	285	Jitotol
		0.03464	382	Chempil
	D	0.02582	441	Las Piedrecitas

Provenance code: 11 = Chempil, Mexico
 13 = Jitotol, Mexico
 15 = Las Piedrecitas, Mexico
 16 = Montebello, Mexico

* Control lots: 200 = Pinus tecunumanii, San Jeronimo, Guatemala
 405 = Pinus oocarpa, Commercial control, CAFMA

***** 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>
392	16	42	77.78	10.0	19.93	13.8	0.06181
381	16	48	88.89	9.9	15.67	12.7	0.05065
375	16	39	72.22	8.9	24.32	12.5	0.04855
382	16	39	72.22	9.7	15.27	12.4	0.04826
356	11	53	98.15	9.6	17.28	12.5	0.04776
393	16	47	87.04	9.4	22.64	12.1	0.04726
430	13	53	98.15	9.0	19.06	12.3	0.04470
200	*	45	83.33	9.1	25.49	11.8	0.04380
427	13	45	83.33	8.9	11.77	12.2	0.04208
412	13	48	88.89	9.1	15.46	11.8	0.04185
369	11	45	83.33	8.9	20.57	11.7	0.04184
405	*	52	96.30	8.9	19.01	11.6	0.04103
389	16	37	68.52	8.9	29.04	10.9	0.04077
370	11	51	94.44	9.1	18.50	11.5	0.04022
378	16	49	90.74	9.0	23.77	11.0	0.03813
422	13	48	88.89	7.8	21.13	11.3	0.03515
317	15	51	94.44	8.6	14.22	11.2	0.03491
376	16	45	83.33	8.6	26.13	10.6	0.03397
366	11	45	83.33	8.3	20.01	10.7	0.03228
424	13	48	88.89	8.1	23.13	10.4	0.03144
321	15	51	94.44	7.9	15.45	10.9	0.03089
372	11	52	96.30	8.0	24.43	10.3	0.02988
362	11	47	87.04	8.4	21.02	10.1	0.02949
426	13	43	79.63	8.0	19.98	10.5	0.02940
368	11	43	79.63	7.9	21.75	9.8	0.02780
319	15	49	90.74	7.6	22.74	10.2	0.02759
314	15	48	88.89	7.7	23.71	10.0	0.02740
309	15	44	81.48	7.6	18.44	10.1	0.02651
348	11	46	85.19	7.8	24.60	9.7	0.02562
322	15	50	92.59	7.1	23.13	9.9	0.02518
323	15	43	79.63	6.7	23.39	9.2	0.02043
315	15	51	94.44	6.9	24.73	9.0	0.02005
308	15	48	88.89	6.4	29.06	7.7	0.01541

OVERALL		1448	86.50	8.4	23.50	10.9	0.03521

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.