

C A M C O R E

ANOVA AND MULTIPLE COMPARISONS FOR PROVENANCE AND FAMILY VOLUME

FIVE YEAR MEASUREMENTS

TEST IDENTIFICATION: 13-06-02D
SPECIES: Pinus tecunumanii - High elevation
COMPANY: EMBRAPA
SITE NAME: CPAC
LATITUDE: 15° 32' S
LONGITUDE: 47° 39' W
ELEVATION: 1190 m
ANNUAL PRECIPITATION: 1546 mm

DATE PLANTED: December 1984
DATE MEASURED: January 1990

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	8	0.00345098	1.90 ns
PROV	6	0.05299966	38.87 **
REP*PROV	48	0.01090804	1.59 *
FAM(PROV)	33	0.01940851	4.11 **
REP*FAM(PROV)	256	0.03664568	1.11 ns
ERROR	1514	0.19502655	
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CORRECTED TOTAL	1865	0.32290902	

ns: Not significant

* Significant at $p < .05$
** Significant at $p < .01$

TEST MEAN
0.02563 m³

C.V. (%)
44.28

***** 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	0.03327	386	Montebello
	A			
B	A	0.03134	47	* M. P. R.
B				
B	C	0.02802	357	Chempil
	C			
	C	0.02647	302	Jitotol
	D	0.02215	391	San Jose
	D			
	D	0.02102	46	* Control 405
	E	0.01748	337	Las Piedrecitas

* Control lots: 200 = P. tec., Commercial control, M.P.R., Belize
 405 = 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>
375	16	46	85.19	7.7	20.13	13.0	0.03939
392	16	50	92.59	7.8	12.37	12.5	0.03800
356	11	43	79.63	7.7	14.30	12.1	0.03580
393	16	49	90.74	7.8	10.38	12.0	0.03494
387	16	46	85.19	7.7	18.10	12.0	0.03434
382	16	49	90.74	7.6	13.17	11.6	0.03250
412	13	40	74.07	7.3	17.09	11.5	0.03157
200	*	47	87.04	7.2	12.80	11.7	0.03134
355	11	45	83.33	7.2	16.80	11.4	0.03123
403	16	51	94.44	7.4	14.82	11.0	0.02990
384	16	46	85.19	7.5	18.71	10.8	0.02963
362	11	50	92.59	7.2	17.61	10.8	0.02841
430	13	39	72.22	7.0	12.12	11.3	0.02823
422	13	46	85.19	6.7	18.09	11.2	0.02799
369	11	43	79.63	7.0	13.60	11.1	0.02782
389	16	49	90.74	7.4	12.14	10.8	0.02770
352	11	47	87.04	6.9	17.56	11.0	0.02714
427	13	42	77.78	6.8	13.08	11.1	0.02632
416	13	46	85.19	6.7	13.07	11.0	0.02565
348	11	41	75.93	6.7	14.70	10.8	0.02521
349	11	49	90.74	6.8	16.29	10.6	0.02470
344	20	47	87.04	6.3	17.75	10.9	0.02433
327	20	50	92.59	6.3	18.71	10.7	0.02424
329	20	46	85.19	6.3	14.83	10.7	0.02383
314	15	43	79.63	6.4	18.63	10.5	0.02373
340	20	50	92.59	6.5	17.04	10.5	0.02365
372	11	39	72.22	6.7	18.41	10.3	0.02362
336	20	50	92.59	6.5	13.97	10.7	0.02355
426	13	42	77.78	6.6	18.97	10.2	0.02350
406	13	47	87.04	6.6	12.14	10.4	0.02276
339	20	48	88.89	6.2	15.60	10.5	0.02252
331	20	50	92.59	6.5	14.85	10.4	0.02239
405	*	46	85.19	6.8	14.36	9.7	0.02102
323	15	50	92.59	5.8	15.74	9.8	0.01829
310	15	48	88.89	6.1	17.07	9.6	0.01800
300	15	49	90.74	5.8	16.40	9.7	0.01770
317	15	47	87.04	5.8	18.03	9.2	0.01644
304	15	50	92.59	5.5	22.79	8.9	0.01568
308	15	50	92.59	5.6	17.16	8.5	0.01336
337	20	51	94.44	5.5	14.16	8.6	0.01321

13-06-02D

***** MEANS BY FAMILY *****

	<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>
OVERALL	1774	86.45	6.7	18.88	10.7	0.02560

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.

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