

C A M C O R E

ANOVA AND MULTIPLE COMPARISONS FOR PROVENANCE AND FAMILY HEIGHT

THREE YEAR MEASUREMENTS

TEST IDENTIFICATION: 12-02-07C
SPECIES: Pinus chiapensis
COMPANY: Cartón de Colombia
SITE NAME: Los Guaduales
LATITUDE: 28° 36' N
LONGITUDE: 76° 36' W
ELEVATION: 1750 m
ANNUAL PRECIPITATION: 1351 - 3115 mm

DATE PLANTED: October 1986
DATE MEASURED: November 1989

ANALYSIS OF VARIANCE

DEPENDENT VARIABLE: Three Year Height (meters)

<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>F VALUE</u>
REP	8	406.24388363	4.67 **
PROV	7	234.79156847	3.08 **
REP*PROV	55	598.18797649	3.52 **
FAM(PROV)	46	495.53537608	3.49 **
REP*FAM(PROV)	367	1132.85047304	3.64 **
ERROR	2078	1762.15083334	

CORRECTED TOTAL	2561	5627.78624903	

ns: Not significant

** Significant at $p < .01$

TEST MEAN
3.80 m

C.V. (%)
24.23

12-02-07C

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

The Duncan-Waller Multiple Comparison procedure shows no significant differences among the provenances.

	<u>Provenance</u>	<u>N</u>	<u>% Survival</u>	<u>Mean Height (meters)</u>	<u>C.V. (%)</u>	<u>Mean Diameter (cm)</u>
7	Pueblo Nuevo	52	96.30	4.68	28.01	4.63
3	La Libertad	48	88.89	4.51	32.95	4.51
*999	South Africa	50	92.59	4.45	24.35	6.20
5	Larrainzar	396	91.67	4.19	40.04	4.00
2	Guevea	136	83.95	4.09	26.32	4.00
6	Pohlo	249	88.89	3.89	38.16	3.64
*998	El Pital	45	83.33	3.63	21.33	5.58
1	Barillas	1595	86.87	3.60	40.17	3.11

* Control lots: 998 = Pinus oocarpa, South Africa
999 = Pinus patula, El Pital

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

<u>Family</u>	<u>Prov</u>	<u># Trees</u>	<u>% Survival</u>	<u>Mean Height (m)</u>	<u>C.V. (%)</u>	<u>Mean Diameter (cm)</u>
106	1	53	98.15	5.08	31.22	5.12
307	5	48	88.89	4.81	40.04	4.47
334	2	46	85.19	4.73	20.20	4.88
64	7	52	96.30	4.67	28.01	4.63
97	3	48	88.89	4.51	32.95	4.51
308	5	52	96.30	4.48	42.34	4.71
352	1	48	88.89	4.46	26.03	4.28
999	*	50	92.59	4.45	24.35	6.20
112	1	50	92.59	4.40	34.24	4.39
262	6	49	90.74	4.37	33.29	4.07
291	5	45	83.33	4.30	36.48	3.91
306	5	53	98.15	4.25	32.07	4.00
294	5	51	94.44	4.21	33.09	3.74
345	1	48	88.89	4.09	34.52	3.35
359	1	47	87.04	4.05	27.20	3.63
348	1	46	85.19	4.05	33.88	3.55
344	1	52	96.30	4.03	34.90	3.52
263	6	52	96.30	4.03	37.30	4.10
299	5	51	94.44	4.00	34.20	3.91
340	1	47	87.04	3.94	26.75	3.43
347	1	46	85.19	3.91	31.06	3.66
371	1	48	88.89	3.91	35.83	3.00
319	2	50	92.59	3.81	28.25	3.42
374	1	49	90.74	3.76	41.84	3.46
301	5	49	90.74	3.76	52.01	3.54
255	6	46	85.19	3.72	36.85	3.48
321	2	40	74.07	3.72	23.81	3.69
250	6	46	85.19	3.71	36.62	3.35
297	5	47	87.04	3.69	45.22	3.68
372	1	49	90.74	3.65	36.97	3.27
365	1	44	81.48	3.63	34.85	3.08
998	*	45	83.33	3.63	21.33	5.58
350	1	51	94.44	3.60	35.03	3.22
256	6	47	87.04	3.57	45.58	3.12
351	1	48	88.89	3.56	48.62	3.23
349	1	46	85.19	3.52	40.47	2.95
367	1	46	85.19	3.51	30.31	2.92
360	1	43	79.63	3.47	35.31	2.93
346	1	46	85.19	3.47	39.85	2.93
354	1	44	81.48	3.45	46.89	2.85
369	1	46	85.19	3.38	38.68	2.93
353	1	46	85.19	3.37	40.96	2.76

<u>Family</u>	<u>Prov</u>	<u># Trees</u>	<u>% Survival</u>	<u>Mean Height (m)</u>	<u>C.V. (%)</u>	<u>Mean Diameter (cm)</u>
370	1	49	90.74	3.36	36.34	2.92
368	1	43	79.63	3.32	41.58	2.77
362	1	48	88.89	3.29	47.82	2.73
356	1	50	92.59	3.27	51.91	2.64
366	1	45	83.33	3.26	39.19	2.46
357	1	44	81.48	3.20	42.43	2.60
373	1	47	87.04	3.17	42.48	2.59
355	1	46	85.19	3.14	43.42	2.42
363	1	47	87.04	3.09	48.07	2.56
341	1	45	83.33	3.01	47.71	2.41
364	1	45	83.33	2.84	38.31	2.21
358	1	43	79.63	2.69	47.47	2.00

OVERALL		2467	87.86	3.79	39.47	3.41

Note: Tree volume with bark was calculated using a formula for juvenile trees: $\text{Volume (cubic meters)} = 0.0003 \cdot D^2 \cdot H$, where D=DBH in centimeters and H = total height in meters.

The overall means do not include control lots.

Provenance code: 1 = Barillas, Guatemala
 2 = Guevea de Humboldt, Mexico
 3 = La Libertad, Mexico
 5 = Larrainzar, Mexico
 6 = Pohlo, Mexico
 7 = Pueblo Nuevo, Mexico