

C A M C O R E

ANOVA AND MULTIPLE COMPARISONS  
FOR PROVENANCE AND FAMILY HEIGHT

FIVE YEAR MEASUREMENTS

TEST IDENTIFICATION: 02-04-01A  
SPECIES: Pinus oocarpa  
COMPANY: CONARE  
SITE NAME: Cerro el Chao  
LATITUDE: 9° 28' N  
LONGITUDE: 70° 13' W  
ELEVATION: 1200 - 1300m  
ANNUAL PRECIPITATION: 700 - 800mm

DATE PLANTED: September 1982  
DATE MEASURED: September 1987

ANALYSIS OF VARIANCE

DEPENDENT VARIABLE: FIVE YEAR HEIGHT (meters)

<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>F VALUE</u>
REP	8	202.14619116	
PROV	7	39.78103345	1.34 ns
REP*PROV	56	238.02845502	
FAM(PROV)	8	18.72265767	3.16 **
REP*FAM(PROV)	64	47.40109875	
ERROR	674	400.58700000	
CORRECTED TOTAL	817	979.04987775	

\*\* Significant at  $p < .01$       ns: not significant

TEST MEAN                      C.V. (%)  
2.0787                          37.0869

The analysis of variance shows no significant differences among the provenances.

<u>PROVENANCE</u>	<u>MEAN</u>	<u>N</u>
San Lorenzo	2.3824	153
Mt. Pine Ridge	2.3415	53
La Unión	2.3275	51
Chiquimila	2.1904	52
La Lagunilla	2.0485	103
La Mina	1.9913	104
San José	1.8930	100
Tapalapa	1.8406	202

WALLER-DUNCAN MULTIPLE COMPARISONS FOR FIVE YEAR FAMILY HEIGHTMEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

<u>WALLER</u>	<u>GROUPING</u>	<u>MEAN</u>	<u>N</u>	<u>FAMILY</u>	<u>PROVENANCE</u>
	A	2.5360	50	54	7
	A				
	A	2.4887	53	55	7
	A				
B	A	2.3415	53	202	*
B	A				
B	A	2.3275	51	441	6
B	A				
B	A	2.2245	49	62	3
B	A				
B	A	2.1904	52	201	*
B	A				
B	A	2.1404	52	29	4
B	A				
B	A	2.1160	50	56	7
B	A				
B	A	2.0558	52	5	1
B	A				
B	A	2.0412	51	9	1
B	A				
B	A	2.0122	49	38	5
B	A				
B	A	1.8804	51	59	3
B	A				
B	A	1.8423	52	31	4
B	A				
B	A	1.7784	51	34	5
B	A				
B	A	1.7462	52	60	3
B					
B		1.5220	50	58	3

ANOVA AND MULTIPLE COMPARISONS  
FOR PROVENANCE AND FAMILY VOLUME

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	0.95143292	
PROV	7	0.90651196	3.86 **
REP*PROV	55	1.84473740	
FAM (PROV)	8	0.03518126	0.22 ns
REP*FAM (PROV)	58	1.18095813	
ERROR	466	10.28591197	
<hr/>			
CORRECTED TOTAL	602	15.88257965	

\*\* Significant at  $p < .01$     ns: not significant

TEST MEAN	C.V. (%)
0.12049	123.3052

Note: Tree vomume with bark was calculated using a formula for juvenile trees:  $\text{Volume} = .00003 D^2 H$ , where D = D.B.H. in centimeters and H = total height in meters.

WALLER-DUNCAN MULTIPLE COMPARISONS FOR FIVE YEAR PROVENANCE VOLUMEMEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

<u>WALLER</u>	<u>GROUPING</u>	<u>MEAN</u>	<u>N</u>	<u>PROVENANCE</u>
	A	0.19869	117	San Lorenzo
	A			
B	A	0.14848	39	Mt. Pine Ridge
B	A			
B	A	0.14377	76	La Mina
B				
B		0.11831	44	La Unión
B				
B		0.09061	42	Chiquimula
B				
B		0.09050	74	San José
B				
B		0.08848	80	La Lagunilla
		0.07560	131	Tapalapa

WALLER-DUNCAN MULTIPLE COMPARISONS FOR FIVE YEAR FAMILY VOLUMEMEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

<u>WALLER</u>	<u>GROUPING</u>	<u>MEAN</u>	<u>N</u>	<u>FAMILY</u>	<u>PROVENANCE</u>
	A	0.20659	34	56	7
	A				
	A	0.20000	42	55	7
	A				
B	A	0.19080	41	54	7
B	A				
B	A	0.15175	39	29	4
B	A				
B	A	0.14848	39	202	*
B	A				
B	A	0.13536	37	31	4
B	A				
B	A	0.11831	44	441	6
B	A				
B		0.10587	37	38	5
		0.09169	38	5	1
		0.09061	42	201	*
		0.08558	42	9	1
		0.08189	36	59	3
		0.07701	40	62	3
		0.07514	37	34	5
		0.07448	33	60	3
		0.06442	22	58	3

Provenance code: 1 = La Lagunilla, Guatemala  
 3 = Tapalapa, Guatemala  
 4 = La Mina, Guatemala  
 5 = San José, Guatemala  
 6 = La Unión, Guatemala  
 7 = San Lorenzo, Guatemala

\* Commercial Control: 201 = P. oocarpa, Chiquimila, Guatemala  
 202 = P. tecunumanii, Mt. Pine Ridge, Belize