

C A M C O R E

ANOVA AND MULTIPLE COMPARISONS FOR PROVENANCE AND FAMILY HEIGHT

FIVE YEAR MEASUREMENTS

TEST IDENTIFICATION: 06-04-18A
 SPECIES: Pinus oocarpa
 COMPANY: CONARE
 SITE NAME: Nirgua
 LATITUDE: 8° N
 LONGITUDE: 65° W

DATE PLANTED: July 1983
 DATE MEASURED: August 1988

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	1020.29861910	
PROV	8	214.22893581	1.71 ns
REP*PROV	58	908.09174794	
FAM(PROV)	45	374.92842477	1.28 ns
REP*FAM(PROV)	242	1579.47342423	
ERROR	1562	9478.87033334	
CORRECTED TOTAL	1923	13901.69648129	

ns: not significant

TEST MEAN C.V. (%)
 5.5757 .44.1811

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

	<u>PROVENANCE</u>	<u>MEAN</u>	<u>N</u>
	La Lagunilla	6.0902	276
	Tablazon	5.7589	168
	San Marcos	5.7444	293
(FUD)	Nirgua	5.6575	40
	El Castaño	5.6491	293
	Las Crucitas	5.4460	163
	San Luís	5.4171	351
(202)	Mt. Pine Ridge	5.3422	45
	Guaimaca	5.0346	295

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	9.1625	16	188	9
	A				
B	A	7.3383	47	130	3
B	A				
B	A	6.8750	8	242	8
B	A				
B	C	6.2214	28	238	8
B	C				
B	C	6.1412	17	193	9
B	C				
B	C	6.0632	19	6	3
B	C				
B	C	6.0447	38	147	2
B	C				
B	C	5.9719	32	125	3
B	C				
B	C	5.9319	47	95	4
B	C				
B	C	5.9264	53	134	3
B	C				
B	C	5.9255	51	155	2
B	C				
B	C	5.9213	47	232	8
B	C				
B	C	5.8800	20	122	3
B	C				
B	C	5.8612	49	162	3
B	C				
B	C	5.8300	30	279	6
B	C				
B	C	5.8195	41	97	4
B	C				
B	C	5.8098	41	140	2
B	C				
B	C	5.7556	9	152	2
B	C				
B	C	5.7059	34	275	6
B	C				
B	C	5.6857	21	128	3
B	C				
B	C	5.6761	46	257	8
B	C				

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<u>WALLER</u>	<u>GROUPING</u>	<u>MEAN</u>	<u>N</u>	<u>FAMILY</u>	<u>PROVENANCE</u>
B	C	5.6692	39	251	8
B	C				
B	C	5.6615	26	254	8
B	C				
B	C	5.6575	40	FUD	*
B	C				
B	C	5.6154	39	115	4
B	C				
B	C	5.6115	26	171	9
B	C				
B	C	5.6080	50	247	8
B	C				
B	C	5.5795	39	320	7
B	C				
B	C	5.5533	30	398	9
B	C				
B	C	5.5060	50	137	2
B	C				
B	C	5.4773	22	169	9
B	C				
B	C	5.4717	53	149	2
B	C				
B	C	5.4686	35	135	3
B	C				
B	C	5.4261	23	295	6
B	C				
B	C	5.4245	49	234	8
B	C				
B	C	5.3422	45	202	*
B	C				
B	C	5.3136	44	93	4
B	C				
B	C	5.2549	51	145	2
B	C				
B	C	5.2545	44	114	4
B	C				
B	C	5.2478	46	337	7
B	C				
B	C	5.2400	45	113	4
B	C				
B	C	5.2244	45	118	4
B	C				
B	C	5.2096	52	272	6
B	C				
B	C	5.1784	37	328	7
B	C				
B	C	5.1696	23	178	9

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<u>WALLER</u>	<u>GROUPING</u>	<u>MEAN</u>	<u>N</u>	<u>FAMILY</u>	<u>PROVENANCE</u>
B	C				
B	C	5.1400	50	332	7
B	C				
B	C	5.1292	24	266	6
B	C				
B	C	5.0593	27	316	7
B	C				
B	C	4.9804	46	112	4
B	C				
B	C	4.8812	16	199	9
B	C				
B	C	4.8056	18	175	9
B	C				
B	C	4.7238	42	341	7
B	C				
B	C	4.6730	37	318	7
	C				
	C	4.1000	17	321	7

**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	0.03544598	
PROV	8	0.00235557	1.09 ns
REP*PROV	58	0.01571129	
FAM(PROV)	45	0.01092638	1.71 **
REP*FAM(PROV)	242	0.03435065	
ERROR	1530	0.12037461	
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CORRECTED TOTAL	1891	0.22903975	

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

TEST MEAN	C.V. (%)
0.01262	70.2968

Note: Tree volume 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.

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The analysis of variance shows no significant differences among the five year volume measurements.

	<u>PROVENANCE</u>	<u>MEAN</u>	<u>N</u>
	Tablazon	0.013758	168
	San Marcos	0.013663	293
	La Lagunilla	0.013622	276
	El Castaño	0.013209	293
(FUD)	Nirgua	0.012359	40
	San Luis	0.012291	351
(202)	Mt. Pine Ridge	0.012052	45
	Las Cricitas	0.011575	163
	Guaimaca	0.010441	295

WALLER-DUNCAN MULTIPLE COMPARISONS FOR FIVE YEAR 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>PROVENACNE</u>
	A	0.024642	16	188	9
	A				
B	A	0.019548	8	242	8
B	A				
B	A	0.019205	17	193	9
B	A				
B	A C	0.018016	9	152	2
B	A C				
B D	A C	0.017730	46	95	4
B D	A C				
B D	A C	0.017663	19	6	3
B D	A C				
B D	A C	0.017195	28	238	8
B D	A C				
B D	A C	0.015692	25	171	9
B D	A C				
B D	A C	0.015274	47	232	8
B D	A C				
B D	A C	0.015116	21	128	3
B D	A C				
B D	A C	0.015021	36	320	7
B D	A C				
B D	A C	0.014937	46	234	8
B D	A C				
B D	A C	0.014845	47	130	3
B D	A C				
B D	A C	0.014817	51	155	2
B D	A C				
B D	A C	0.014373	53	134	3
B D	A C				
B D	A C	0.014341	41	97	4
B D	A C				
B D	A C	0.014051	20	122	3
B D	A C				
B D	A C	0.013889	39	115	4
B D	A C				
B D	A C	0.013794	38	147	2
B D	A C				
B D	A C	0.013516	49	137	2
B D	A C				
B D	A C	0.013334	49	247	8
B D	A C				

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<u>WALLER</u>	<u>GROUPING</u>	<u>MEAN</u>	<u>N</u>	<u>FAMILY</u>	<u>PROVENACNE</u>	
B	D	C	0.013323	34	135	3
B	D	C				
B	D	C	0.013222	41	140	2
B	D	C				
B	D	C	0.012996	21	169	9
B	D	C				
B	D	C	0.012981	30	398	9
B	D	C				
B	D	C	0.012880	33	275	6
B	D	C				
B	D	C	0.012759	22	295	6
B	D	C				
B	D	C	0.012504	50	149	2
B	D	C				
B	D	C	0.012485	14	321	7
B	D	C				
B	D	C	0.012359	40	FUD	*
B	D	C				
B	D	C	0.012262	32	125	3
B	D	C				
B	D	C	0.012104	39	251	8
B	D	C				
B	D	C	0.012080	26	254	8
B	D	C				
B	D	C	0.012052	44	202	*
B	D	C				
B	D	C	0.011961	44	337	7
B	D	C				
B	D	C	0.011907	43	114	4
B	D	C				
B	D	C	0.011469	30	279	6
B	D	C				
B	D	C	0.011205	52	272	6
B	D	C				
B	D	C	0.010970	44	93	4
B	D	C				
B	D	C	0.010703	51	145	2
B	D	C				
B	D	C	0.010348	49	162	3
B	D	C				
B	D	C	0.010219	50	332	7
B	D	C				
B	D	C	0.010117	44	118	4
B	D	C				
B	D	C	0.010077	26	316	7
B	D	C				

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<u>WALLER</u>	<u>GROUPING</u>	<u>MEAN</u>	<u>N</u>	<u>FAMILY</u>	<u>PROVENANCE</u>
B	D C	0.010059	45	257	8
B	D C				
B	D C	0.009778	45	112	4
B	D C				
B	D C	0.009775	45	113	4
B	D C				
B	D C	0.009647	23	178	9
B	D C				
B	D C	0.009631	24	266	6
B	D C				
B	D C	0.009569	14	199	9
B	D C				
B	D C	0.009262	36	328	7
	D C				
	D C	0.008066	36	318	7
	D C				
	D C	0.007775	42	341	7
	D C				
	D	0.006952	18	175	9

Provenance code: 2 = El Castaño, Guatemala
 3 = La Lagunilla, Guatemala
 4 = San Luís, Guatemala
 6 = Las Crucitas, Honduras
 7 = Guaimaca, Honduras
 8 = San Marcos, Honduras
 9 = Tablazon, Honduras

* Commercial Control: 202 = P. tecunumanii, Mt. Pine Ridge, Belize
 FUDECO = P. oocarpa, Nirgua, Venezuela