

C A M C O R E

FIVE YEAR MEASUREMENTS

TEST IDENTIFICATION: 13-02-11C
 SPECIES: Pinus tecunumanii
 COMPANY: Cartón de Colombia
 SITE NAME: Finca San Jose
 ELEVATION: 1750 m
 ANNUAL PRECIPITATION: 1949 - 2060 mm

DATE PLANTED: October 1984
 DATE MEASURED: July 1989

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 | 0.01689750 | 1.16 ns |
| PROV | 9 | 0.21054751 | 12.81 ** |
| REP*PROV | 56 | 0.10223362 | 1.58 ** |
| FAM(PROV) | 31 | 0.11446962 | 3.20 ** |
| REP*FAM(PROV) | 245 | 0.28251595 | 1.12 ns |
| ERROR | 1608 | 1.65232536 | |
| CORRECTED TOTAL | 1957 | 2.37151719 | |

ns: Not significant

** Significant at $p < .01$

TEST MEAN
 0.07907 m³

C.V. (%)
 40.5386

***** 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 | 0.09719 | 404 | San Jeronimo |
| | A | | | |
| | A | 0.09467 | 50 | Comm. Control (200) |
| | B | 0.07690 | 301 | La Soledad |
| | B | | | |
| | B | 0.07401 | 403 | San Vicente |
| | B | | | |
| | B | 0.07345 | 253 | San Lorenzo |
| | B | | | |
| | B | 0.07245 | 404 | Celaque |
| | B | | | |
| | B | 0.07155 | 51 | Agudos (206) |
| | B | | | |
| | B | 0.06906 | 92 | Las Trancas |

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***** 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 DIAMETER (cm)</u> | <u>TREE VOLUME (cubic m)</u> |
|------------|-------------|----------------|---------------|--------------------------------|-----------------|-----------------------------------|--------------------------------------|
| 15 | 5 | 41 | 75.93 | 10.40 | 19.31 | 18.5 | 0.11217 |
| 35 | 5 | 51 | 94.44 | 10.62 | 14.56 | 17.8 | 0.10526 |
| 10 | 5 | 53 | 98.15 | 10.53 | 11.87 | 17.4 | 0.10171 |
| 200 | * | 50 | 92.59 | 9.80 | 18.87 | 17.6 | 0.09467 |
| 33 | 5 | 51 | 94.44 | 10.12 | 15.25 | 17.1 | 0.09422 |
| 39 | 5 | 52 | 96.30 | 10.02 | 19.08 | 16.8 | 0.09369 |
| 37 | 5 | 52 | 96.30 | 10.16 | 15.87 | 17.0 | 0.09285 |
| 18 | 5 | 53 | 98.15 | 10.55 | 8.89 | 16.8 | 0.09142 |
| 31 | 5 | 51 | 94.44 | 9.88 | 15.63 | 17.0 | 0.08930 |
| 283 | 8 | 52 | 96.30 | 9.81 | 18.23 | 16.7 | 0.08689 |
| 136 | 3 | 51 | 94.44 | 9.55 | 15.71 | 17.0 | 0.08659 |
| 6 | 6 | 50 | 92.59 | 9.87 | 16.62 | 16.6 | 0.08645 |
| 272 | 8 | 50 | 92.59 | 9.76 | 14.88 | 16.7 | 0.08481 |
| 83 | 7 | 53 | 98.15 | 9.24 | 14.43 | 17.1 | 0.08365 |
| 89 | 7 | 52 | 96.30 | 9.43 | 18.98 | 16.7 | 0.08185 |
| 97 | 7 | 53 | 98.15 | 9.87 | 14.58 | 16.1 | 0.08121 |
| 264 | 8 | 53 | 98.15 | 9.42 | 13.85 | 16.6 | 0.08074 |
| 144 | 3 | 51 | 94.44 | 9.29 | 19.14 | 16.4 | 0.08001 |
| 73 | 6 | 53 | 98.15 | 9.31 | 19.38 | 16.1 | 0.07835 |
| 70 | 3 | 52 | 96.30 | 9.17 | 17.79 | 16.3 | 0.07698 |
| 262 | 8 | 53 | 98.15 | 9.79 | 16.57 | 15.7 | 0.07515 |
| 146 | 3 | 51 | 94.44 | 8.37 | 27.17 | 16.2 | 0.07321 |
| 193 | 7 | 50 | 92.59 | 8.71 | 21.09 | 16.1 | 0.07278 |
| 44 | 6 | 49 | 90.74 | 8.97 | 16.77 | 15.7 | 0.07250 |
| 60 | 3 | 48 | 88.89 | 8.88 | 23.51 | 15.7 | 0.07229 |
| 138 | 3 | 48 | 88.89 | 8.90 | 22.29 | 15.4 | 0.07173 |
| 263 | 8 | 51 | 94.44 | 9.12 | 23.48 | 15.4 | 0.07167 |
| 206 | * | 51 | 94.44 | 8.99 | 18.75 | 15.4 | 0.07155 |
| 220 | 9 | 38 | 70.37 | 8.95 | 18.27 | 15.8 | 0.07102 |
| 77 | 6 | 51 | 94.44 | 8.99 | 18.53 | 15.4 | 0.07034 |
| 92 | 7 | 48 | 88.89 | 9.70 | 18.34 | 14.9 | 0.07027 |
| 90 | 7 | 51 | 94.44 | 9.01 | 18.50 | 15.8 | 0.06997 |
| 217 | 9 | 54 | 100.00 | 8.80 | 12.15 | 15.8 | 0.06768 |
| 85 | 7 | 53 | 98.15 | 9.14 | 15.23 | 15.1 | 0.06652 |
| 87 | 7 | 43 | 79.63 | 9.00 | 18.11 | 14.8 | 0.06346 |
| 267 | 8 | 51 | 94.44 | 9.21 | 17.49 | 14.8 | 0.06257 |
| 275 | 8 | 47 | 87.04 | 8.63 | 20.59 | 14.4 | 0.05967 |
| 12 | 6 | 50 | 92.59 | 8.36 | 21.32 | 14.7 | 0.05937 |
| 269 | 8 | 49 | 90.74 | 8.36 | 20.84 | 14.3 | 0.05628 |

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| | <u># TREES</u> | <u>% SURV</u> | <u>MEAN HEIGHT (m)</u> | <u>C.V. (%)</u> | <u>MEAN DIAMETER (cm)</u> | <u>TREE VOLUME (cubic m)</u> |
|---------|----------------|---------------|--------------------------------|-----------------|-----------------------------------|--------------------------------------|
| OVERALL | 1859 | 93.04 | 9.41 | 18.71 | 16.1 | 0.07886 |

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 mean does not include control lots.

Provenance code: 3 = La Soledad, Guatemala
5 = San Jeronimo, Guatemala
6 = San Lorenzo, Guatemala
7 = San Vicente, Guatemala
8 = Celaque, Honduras
9 = Las Trancas, Honduras

* Control lots: 200 = Pinus tecunumanii, Commercial control
206 = Pinus oocarpa, Agudos, Brasil