



Evaluation and Use of Improved Choctawhatchee Sand Pine for Christmas Trees ¹

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This publication offers documentation as to why the Choctawhatchee sand pine--a Florida native shows promise as a fast-growing, reasonably priced Christmas tree with greater freshness than cut trees shipped from out of state.

Background

The use of conifers as Christmas trees is a Florida tradition. Florida, however, is unique in the absence of a traditionally preferred conifer. This phenomenon is attributed to the wide-ranging geographical backgrounds of many adult residents now living in the state.

Florida residents originally cut conifers in the wild for use as Christmas trees. As the population became more urban, the demand was met more by retail lots offering cut trees shipped from northern and Midwestern sources. The availability of locally-grown conifers, managed specifically for use as Christmas trees, developed during the late 1930s and 1940s, and the number of Florida producers has slowly expanded. Membership in the Florida Christmas Tree Association grew from 12 charter members in 1980 to 112 members in 1984. The

number of members is estimated to be about half the number of actual producers of locally-grown Christmas trees in the state.

Species which have been grown in Florida for use as Christmas trees include eastern redcedar (*Juniperus virginiana*), southern redcedar (*J. silicicola*), Arizona cypress (*Cupressus arizonica*), Atlantic whitecedar (*Chamaecyparis thyoides*), Ocala sand pine (*Pinus clausa* var. *clausa*), Choctawhatchee sand pine (*P. clausa* var. *immuginata*), spruce pine (*P. glabra*), shortleaf pine (*P. echinata*), slash pine (*P. elliottii* var. *elliottii*), Virginia pine (*P. virginiana*) and loblolly pine (*P. taeda*).

Of these, Eastern redcedar, Choctawhatchee sand pine, Virginia pine, and spruce pine currently are the most popular. These four Florida-grown species have two market advantages, especially when produced in a "cut-and-choose" management system:

- lower selling price and
- increased freshness contrasted with cut trees shipped from out-of-state.

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Any of these four species may be grown in Florida over 3- or 4-year rotations as contrasted with 7- to 10-year rotations for trees grown in the North or Midwest. In particular, Choctawhatchee sand pine is preferred (Rockwood 1977) because of five features:

1. attractive compact foliage of sheared trees;
2. rapid growth rate;
3. adaptability to droughty, infertile sandy sites prevalent in Florida (Rockwood and Kok 1978);
4. high level of natural resistance to pine tip moth (*Rhyacionia* spp.), mushroom root rot (*Clitocybe tabescens*), and other pests; and
5. positive and rapid growth response to commercial fertilizers.

As the demand for Choctawhatchee sand pine seedling stock increases for use in the Florida Christmas tree industry, so must quality increase-- if local producers are to increase their present 3% share of the market.

Selection of breeding stock for Christmas tree form --e.g.:

stem straightness

branch angle, foliar development, and

retention of needle color following cutting--

are critical aspects in improving the supply of high-quality, Florida-grown sand pine.

Of 158 Choctawhatchee sand pines selected in natural stands in Florida, most have been established in a sufficient number of genetic tests to evaluate growth and other characteristics related to commercial pulpwood production (Flinchum *et al.*, 1985). Twenty-five tests were established from 1975 through 1985 within the Cooperative Forest Genetics Research Program (CFGRP) at the University of Florida.

Materials and Methods

Four Christmas tree tests including 33 open-pollinated progenies were installed beginning in

1981. Of the four tests, those near Newberry (0-77C) and Alachua (0-77D) developed well enough to provide estimates of variability for desired Christmas tree form and color. Test 0-77C received virtually no maintenance since planting in 1981, while Test 0-77D had maximal culture, including thorough site preparation, weed control, and periodic pruning. Ten progenies were common to the two tests.

In January 1985, height, survival, and Christmas tree score on a 1 (poor) to 5 (excellent) scale were determined for Tests 0-77C and 0-77D. Progeny means were obtained for each trait and compared.

Results and Discussion

Under maximal culture (Test 0-77D), nearly all progenies survived well and grew satisfactorily (Table 1).

With minimal culture (Test 0-77C), several progenies had unacceptable survival, but surviving trees generally grew well on the fairly rich site.

Variability for Christmas tree score was considerable on both sites and overall. **On the 1 to 5 scale, 3 was considered to be an acceptable tree.** Eight of 15 progenies averaged acceptable or better under minimal culture, while a similar proportion (15 of 28) of progenies equaled this standard with maximal care. Six of the 10 progenies common to both tests (109-71, 111-71, 112-71, 116-71, 117-71, 118-71) consistently averaged acceptable or better. These six progenies plus acceptable progenies occurring in only one test (121-71, 130-71, 133-71, 162-71, 165-71, 60-81, 65-81, 69-81, 70-81, 73-81) provide an opportunity to expand the number of clones from five (104-71, 105-71, 107-71, 109-71, 124-71) that had been previously selected based on ramet appearance in a seed orchard.

The 16 top-rated progenies for Christmas tree score differed for height growth. Some such as 133-71 and 162-71 exceeded individual test mean height and surpassed checklots in other progeny tests. Others like 69-81 were shorter than the individual test average and were worse than the unimproved checklot in other tests.

Overall, however, these best progenies equaled or slightly exceeded mean heights in Tests 0-77C and 0-77D and bettered the height obtained by unimproved checks in other tests by about two percent.

While height growth *per se* is not of primary importance in Christmas tree production, Choctawhatchee sand pine selected for desirable form can be expected to reach merchantable size at least as soon as unimproved trees.

However, progeny height growth potential can be assessed by using CFGRP progeny evaluations from many other tests (Hodge *et al.* 1994). Just as the 33 progenies varied in Christmas tree score, they vary in growth rate from slow (requiring four years to reach Christmas tree size) to relatively fast (needing perhaps only three years to be harvestable).

Choctawhatchee sand pine that is genetically superior for Christmas tree production may be available from several sources. To request seedlings of the best progenies, contact:

Tree Improvement Manager
Florida Division of Forestry
Milton, FL 32570
Phone (850) 957-6160

Ochard Manager
International Paper Co.
Marianna, FL 32446
Phone (850) 594-6001

By using improved seedlings, Florida growers can produce more high-quality Choctawhatchee sand pine Christmas trees.

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Table 1. Height, Christmas tree score and survival of 33 Choctawhatchee sand pine progenies grown under minimal (Test 0-77C) and maximal (Test 0-77D) culture.

| Progeny | 0-77C/4th-Year | | | 0-77D/2nd-Year | | | Overall Score |
|---------|----------------|-------|-------------|----------------|-------|-------------|---------------|
| | Ht(m) ft | Score | Survival(%) | Ht(m) ft | Score | Survival(%) | |
| 102-71 | (3.3) 10.2 | 2.0 | 94 | | | | 2.0 |
| 104-71 | (2.4) 7.9 | 2.2 | 43 | (1.2) 3.9 | 2.5 | 100 | 2.4 |
| 106-71 | | | | (1.2) 3.9 | 1.4 | 67 | 1.4 |
| 107-71 | | | | (1.2) 3.9 | 2.8 | 96 | 2.8 |
| 108-71 | (2.4) 7.9 | 2.1 | 62 | (1.4) 4.6 | 3.0 | 100 | 2.7 |
| 109-71* | (2.9) 9.5 | 3.1 | 56 | (1.4) 4.6 | 3.8 | 100 | 3.5 |
| 110-71 | (2.9) 9.5 | 2.6 | 61 | (1.2) 3.9 | 2.2 | 93 | 2.4 |
| 111-71* | (2.6) 8.6 | 3.1 | 64 | (1.2) 3.9 | 3.3 | 100 | 3.2 |
| 112-71* | (2.7) 8.9 | 3.0 | 35 | (1.3) 4.3 | 3.4 | 100 | 3.1 |
| 116-71* | (2.5) 8.2 | 3.0 | 50 | (1.3) 4.3 | 3.4 | 100 | 3.3 |
| 117-71* | (2.7) 8.9 | 3.1 | 77 | (1.3) 4.3 | 3.0 | 100 | 3.0 |
| 118-71* | (2.8) 9.2 | 3.3 | 80 | (1.5) 4.9 | 3.4 | 100 | 3.3 |
| 121-71* | (2.9) 9.5 | 3.4 | 84 | | | | 3.4 |
| 124-71 | (2.7) 8.9 | 2.7 | 43 | (1.3) 4.3 | 2.8 | 100 | 2.8 |
| 130-71* | | | | (1.3) 4.3 | 3.0 | 100 | 3.0 |
| 131-71 | | | | (1.3) 4.3 | 2.8 | 100 | 2.8 |
| 133-71* | (3.1) 10.2 | 4.5 | 67 | | | | 4.5 |
| 140-71 | | | | (1.3) 4.3 | 2.7 | 97 | 2.7 |
| 141-71 | | | | (1.2) 3.9 | 2.7 | 97 | 2.7 |
| 153-71 | | | | (1.3) 4.3 | 2.8 | 95 | 2.8 |
| 162-71* | | | | (1.5) 4.9 | 4.1 | 100 | 4.1 |
| 165-71* | | | | (1.4) 4.6 | 3.6 | 100 | 3.6 |
| 181-71 | (3.0) 9.8 | 2.7 | 90 | | | | 2.7 |
| 60-81* | | | | (1.3) 4.3 | 3.3 | 100 | 3.3 |
| 65-81* | | | | (1.5) 4.9 | 3.6 | 100 | 3.6 |
| 67-81 | | | | (1.2) 3.9 | 2.4 | 100 | 2.4 |
| 69-81* | | | | (1.2) 3.9 | 3.0 | 95 | 3.0 |
| 70-81* | | | | (1.5) 4.9 | 3.2 | 96 | 3.2 |
| 71-81 | | | | (1.3) 4.3 | 2.8 | 100 | 2.8 |
| 73-81* | | | | (1.3) 4.3 | 3.1 | 100 | 3.1 |
| 76-81 | | | | (1.1) 3.6 | 2.5 | 92 | 2.5 |
| 79-81 | | | | (1.3) 4.3 | 2.8 | 91 | 2.8 |
| Godd | (3.3) 10.2 | 2.4 | 48 | | | | 2.4 |
| Mean | (2.8) 9.2 | 2.9 | 64 | (1.3) 4.3 | 3.0 | 97 | 2.9 |

1 meter = 3.28 feet

*Progeny with acceptable Christmas tree score in one test or overall.