

RADIAL GROWTH OF NINE SELECTED 18-YEAR-OLD BALDCYPRESS PROVENANCES UNDER PROLONGED DROUGHT

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INTRODUCTION

Coastal and bottomland restoration have prompted an interest in species that tolerate wetland and/or saline conditions. It has been suggested that provenance tests may be used to explore a species' response to global climate change (Matyas 1994). Baldcypress, [*Taxodium distichum* (L.) Rich], a canopy dominant in the lower Atlantic and Gulf coast plains, has a broad distribution. Although the wide range suggests a large degree of genetic variability, no studies have explored the genetic variation in radial growth response to drought.

OBJECTIVES

The purpose of this study was to examine how radial growth of provenances may differ in response to long-term drought.

METHODS

In January 1999, we installed dendrometer bands in an 18-year-old baldcypress plantation, composed of 9 provenances from the Mississippi Alluvial Valley. Dendrometer bands were placed on one tree in each family row in each block, for a total of 280 trees. Changes in circumference were recorded weekly. Growth measurements were converted to basal area for comparisons.

RESULTS AND DISCUSSION

There were significant differences for weekly changes in basal area within each provenance across the 4 years of measurement. Only weekly growth at the beginning and end of the growing season were similar among years. Among provenances, cumulative basal area increases differed in 1999 and 2001, years of normal rainfall. However, growth for all provenances was similar in low rainfall years 2000 and 2002. Despite normal rainfall in 2001, onset of growth was delayed in 2002, and total growth did not reach pre-drought levels. Prolonged drought appears to continue to negatively impact radial growth even after rainfall returns to normal levels.

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LITERATURE CITED

- Matyas, C. 1994. Modeling climate-change effects with provenance test data. *Tree Physiology*. 14: 797-804.
- Keeland, B.D.; Sharitz, R.R. 1993. Accuracy of tree growth measurements using dendrometer bands. *Canadian Journal of Forest Research*. 23: 2454-2457.

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