

**PROCEEDINGS OF THE TENTH
SOUTHERN CONFERENCE
ON FOREST TREE IMPROVEMENT**

Houston, Texas

June 17-19.1969

**PROCEEDINGS OF THE TENTH
SOUTHERN CONFERENCE ON FOREST TREE IMPROVEMENT**

Houston, Texas

June 17-19, 1969

**Sponsored Publication No. 30 of the
Southern Forest Tree Improvement Committee
Eastern Tree Seed Laboratory
Box 1077, Macon, Georgia**

**Published by the Texas Forest Service
Texas A&M University, College Station, Texas**

These Proceedings are dedicated to Thurman E. ("Ted" or "Berc") Bercaw. Berc's death in a crossing accident at Livingston, Louisiana, on June 2, deprived his company and his profession of a singularly able man, and the Southern Forest Tree Improvement Committee of a charter member whose contributions were outstanding.

Berc was born in Columbus, Ohio, November 26, 1914. He obtained the B.S. in Forestry at the University of Michigan in 1938, with subsequent work there and at Harvard in forest photogrammetry and photo interpretation. From 1940 to 1946 he served in the U.S. *Army Air Corps*, attaining the rank of Major, and after the War became a Colonel in the Air Force Reserve. After various Federal and State jobs before and after the War, he came to Gaylord Container Corporation (later merged with Crown Zeilerbach Corporation) in **September** 1946, serving successively as Management Forester, Head of the Forest Management Section, and Head of the Research and inventory Section. A scant two months before his death he was promoted to the position of Chief Forester of Crown Zellerbach's Southern Timber Operations. He was active in numerous professional, civic, and trade associations, perhaps his most notable professional appointment was to the U.S. Department of Agriculture's Forestry Research Advisory Council, on which he served with great effect for several years.

I first met Berc in November 1947 on a memorable tour of the Southern Forest Experiment Station's planting and brown-spot-control experiments at Bogalusa, Louisiana, and an inspection of damage by the September hurricane to Gaylord Container's 17-year-old, rust-infected, planted slash pine. From then on until my own retirement in 1964 he and I shared data and ideas on tree diseases and artificial regeneration **In** the mid-Fifties he contributed **the services** of his highly skilled continuous-inventory crews to the 30-year remeasurement of some 20,000 trees **in** the Southern Station's oldest experimental plantations and helped me set up the computer analysis of the results. He and I "cut, our teeth together, so to speak, on forest genetics when, in 1951, **we** were both appointed to the newly formed Committee on Southern Forest Tree Improvement. As Head of Gaylord Container's Forest Management Section he unhesitatingly engineered, in 1952-53, the largest single installation in the Committee's Southwide Pine Seed Source Study.

A big, brilliant, versatile, breezy, rollicking man, Berc galvanized every enterprise in which he took part. Clear-headed boldness and decisiveness always seemed to me his outstanding personal and professional characteristics. He was quick to perceive the essence of a problem, and prompt, imaginative, and thorough in handling it. Work with him was a pleasure as well as an inspiration, and many beside myself will miss him as a forester and as a friend.

Philip C. Wakeley
U.S. Forest Service, Retired

TABLE OF CONTENTS

KEYNOTE ADDRESS

Physiological limitations of productivity, C. H. van Bavel	1
--	---

SESSION I

FIRST AND SECOND GENERATION SELECTION	6
---------------------------------------	---

Recurrent selection in forest tree breeding, Roy Stonecypher	7
--	---

Progress and problems in forest tree selection, J. P. van Buijtenen	17
---	----

A selection system for superior black walnut trees and other hardwoods, Walter F. Beineke and William J. Lowe	27
---	----

Natural variation in seed characteristics and seed yield of black walnut in the Tennessee Valley, T. G. Zarger, R. E. Farmer, Jr. and K. A. Taft	34
--	----

Preliminary selection of eastern cottonwood clones, C. A. Mohn and W. K. Randall.	41
--	----

Intraspecific variation in growth and wood characteristics of two slash pine varieties grown in south Florida, Joseph R. Saucier and Keith W. Dorman	49
--	----

SESSION II

GENETIC GAINS AND PROGENY TEST RESULTS	58
--	----

Genetic improvement in forest trees--growth rate and wood characteristics in young loblolly pine, Bruce Zobel, Robert Kellison, and Martha Matthias	59
---	----

Progeny testing for intensive management, R. E. Goddard and W. H. Smith	76
---	----

Parental selection versus half-sib family selection of longleaf pine, E. Bayne Snyder.....	84
--	----

Clone-site interaction of eastern cottonwood, W. K. Randall and C. A. Mohn.....	
---	--

Variations in height growth and conelet set in two-year-old F ₂ seedlings of loblolly pines, James T. Greene	92
---	----

Testing slash pine for rust resistance in artificial and natural conditions, Ronald J. Dinus.....	98
---	----

Inbreeding as a means of genetic improvement of loblolly pine, E. C. Franklin	107
---	-----

SESSION III

GEOGRAPHIC VARIATION	116
Results of the southwide pine seed source study through 1968-69, O. O. Wells	117
Phenotypic and genotypic variation in eastern cottonwood in the southern Great Plains, Clayton E. Posey.....	130
Pathogenic variability in <u>Cronartium fusiforme</u> , G. A. Snow, H. R. Powers, Jr., and A. G. Kais	136
Electrophoresis separation of general protein and isoenzymes of black cherry seed (<u>Prunus serotina</u> Ehrh.), Ralph A. Lewis, and Franklin C. Cech.....	140
Nonoptimality of local races, Gene Namkoong	149
Provenance testing Mexican pines in the United States and Brazil, L. C. Saylor	154
Early evaluation of a seed source study in eastern redcedar (<u>Juniperus virginiana</u> L.) in South Carolina, Roland E. Schoenike....	165
Geographic variation in growth and wood quality of loblolly pine in North Carolina, Clark W. Lantz and Julian Hofmann	175

SESSION IV

SEED AND SEEDLING ORCHARD MANAGEMENT	189
Seed orchard problems--in retrospect and anticipation, R. L. Marler	190
Some practical aspects of seed orchard management in the South, Frank Vande Linde	199
Soil moisture stress and tracheid length in loblolly pine, A. R. Gilmore	205
Uniform seedling density is important in hardwood progeny test nurseries, Charles D. Webb	208
Fertilization of an eight-year-old slash pine plantation thinned for seed production, John E. Morris and Walter L. Beers, Jr	217
Female-strobilus production in a slash pine seed orchard following branch pruning, R. J. Varnell	222
Influence of rootstock on flowering in shortleaf pine, R.C. Schmidtling .	229
Comparing grafting techniques for black walnut, William J. Lowe and Walter F. Beineke	231