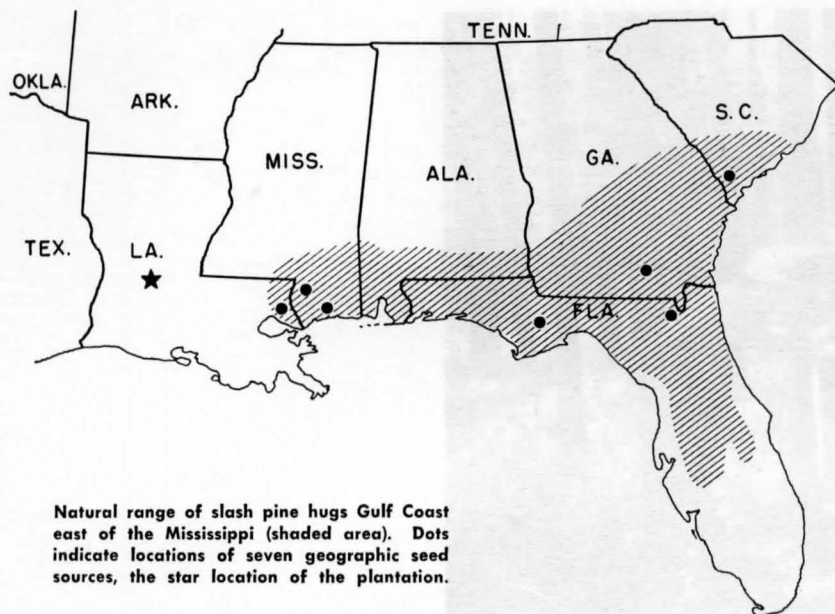




Slash Pine Gum Flow Unaffected by Seed Origin

By JAMES P. BARRETT*

DECISION MAKERS of the reactivated and expanding gum naval stores industry in Louisiana can choose slash pine plantations for chipping without considering the seed source. A recent study showed that gum of slash pine trees from seven different sources was not influenced by where the parents grew.

Briefly, this is what led to the study. In 1960 a group of companies in southwest Louisiana, cooperating in a pilot gum naval stores operation, had a major problem. Their slash pine would not yield enough gum to justify the expense of chipping. They sought help. Ralph Clements, naval stores trouble shooter from the Lake City, Fla., Research Center of

the U. S. Forest Service, came and showed them that slash in Louisiana — properly chipped and attended — could yield well.

The companies also had a question. Their area is outside the natural range of slash pine, although 60 percent of the reforested acreage is planted with slash. The slash pine they wanted to chip, and which they now knew they could chip, was from seed grown across the South. They wanted to know if the geographic source of the seed would influence gum yield.

To find the answer, the Forest Service's Alexandria Research Center launched a study early in 1961 on a nearby 8-acre plantation that had been established in 1936-37 to compare the growth and yields of slash pine from seven geographic seed sources. These sources — in South



To measure the viscosity of gum researchers first collected it in a viscosity tube (in hand) attached to the tree. At right is a capillary tube inserted to measure pressure of exudation, another delicate experiment.

Carolina, Georgia, Florida, Mississippi, and the eastern edge of Louisiana — represent most of slash pine's east-west range and about half of its north-south range (see map). Almost all of the slash pine plantations in the state are from one of these sources. At each one, seed had been collected from 10 or more trees to assure a representative sample. When the gum production study was started, the trees from the seven sources were about equal in size and also appeared to be about equal in susceptibility to fusiform rust (*Forests and People*, Second Quarter, 1960).

The Alexandria workers chose 45 trees from each seed source. Trees were selected at random from those that had at least one-third of their height in living crown and no fusiform cankers on the main stem. They averaged 8.1 inches in diameter and 57 feet in height.

Because most of these trees were too small for commercial naval stores operations, the researchers employed micro-chipping, used at Lake City to estimate gum yielding potential of small trees. With a metal punch, they removed a square inch of bark from the bole about 10 inches above the ground and then sprayed the exposed wood with 50 percent sulfuric acid to open the resin ducts. Gum flowed over a small metal gutter into a can. Every 2 weeks they weighed the gum collected in the can and scraped from the face. Then a new chip was made directly above the old.

Differences in gum production among the seven sources were not im-

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Larry Gillespie (left) takes a can from one of the test trees to weigh collected gum while Hansford Ray weighs the 2-week yield of another micro-chipped slash pine in the experiment.

portant. Yields among trees from the same source often varied more than yields from trees of different sources. This suggests that most slash pine plantations in Louisiana are equally suitable for naval stores operation, regardless of their seed origin. The yields were comparable to those from similar trees at Lake City, which also is good news, for it indicates that the local soils and climate are not limiting factors in gum production.

For all sources, yield varied considerably during the season. From about 38 grams in May, average production increased to 67 grams in August, then dropped to about 33 grams in October. The seasonal trend agrees reasonably well with the trend for slash pine in Florida.

To characterize gum-yielding potential, researchers at Lake City measure gum viscosity and exudation pressure, as well as yield. They have found that high-yielding trees often have thin gum that exudes from the tree with great force. These characteristics of gum flow were measured twice during this study. As with yield, the variation among the seven seed sources was not important.

These findings support other research that indicates no well-defined races of slash pine exist. In other words, they strongly suggest that gum production by planted and native stands of slash pine in the lower Coastal plain—from South



Base of micro-chipped slash pine tree, with metal gutter, collecting can, punch, mallet, and bottle of fifty percent sulphuric acid.

Carolina to Florida and west to Texas—is unaffected by source of seed. More northerly sources of seed, not tested in this study, may differ from the seven sources reported here.

This does not mean that slash pine trees are alike in gum-producing capacity. Individual trees vary considerably, but the variation evidently has nothing to do with the locality from which the seed comes.

The researchers at Lake City are capitalizing on these individual variations to develop strains of slash pine that are superior gum producers. The Alexandria study gives added significance to the development of these new strains, for it suggests that they will be superior over a broad range in the South.