PERFORMANCE OF SOME NON-NATIVE PINES--PONDEROSA, PITCH, PINYON, SCOTCH, AND CORSICAN

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The success or failure of trial plantings with non-native tree species is of general interest to foresters working in either the region of the trial or the natural range of the species. Such plantings are made for one of several reasons--scientific purposes, the search for a foreign species that will perform better than local ones, or because a new species may have a particularly desirable characteristic of wood or some other trait (3, 5, 6). The trial reported here was made so that we could observe the growth of selected non-native trees.

In February 1961, 24 seedlings each of 6 species or varieties (table 1) were outplanted on the George Walton Experimental Forest in south-central Georgia. All seedlings were 2-0 stock except pinyon pine, which was 3-0. They had been produced in nursery beds at Macon, Ga. Seed of both Scotch pine varieties were from central Europe; pitch pine seed, New York State; ponderosa seed, Coconino National Forest, Ariz.; and the Corsican and pinyon pine seed, sources unknown.

The planting site was an old field which had been out of cultivation for more than 10 years.

TABLE 1.--Survival and average total height of 24-tree plots, by year

Species	Remeasurement data							
	March 1962		March 1963		April 1964		April 1965	
	Survival	Height	Survival	Height	Survival	Height	Survival	Height
	Number	*Feet*	*Number*	*Feet*	*Number*	*Feet*	*Number*	*Feet*
Corsican pine (*Pinus nigra* var. *calabrica* (Loudon) Schneid.)	15	0.58	10	0.74	10	0.87	8	0.94
Scotch pine (*P. sylvestris* var. *aquitana*)	10	0.46	2	0.47	2	0.48	2	0.54
Scotch pine (*P. sylvestris* var. *rhodopaea*)	13	0.54	5	0.58	3	0.76	2	0.95
Pitch pine (*P. rigida* Mill.)	23	0.58	18	1.12	18	1.65	18	2.15
Ponderosa pine (*P. ponderosa* Laws.)	20	0.42	17	0.62	15	0.87	10	1.33
Pinyon pine (*P. edulis* Engelm.)	0	--	--	--	--	--	--	--

The soil type was a loamy sand of the Lakeland series with rapid internal drainage and a tendency toward droughtiness. For the 4 years following planting, yearly rainfall was 40, 36, 49, and 72 inches. Weekly rains followed planting for 8 weeks. Summer air temperatures in this vicinity frequently rise into the high nineties (°F.); winter temperatures rarely go below 20 degrees.

Pitch pine, with a 75-percent survival and an average height of 2.1 feet after 4 years, was the most successful species (fig. 1). However, the planting was only about 160 miles south of the southernmost limit of this species' natural range. Pinyon pine, more accustomed to the dry climate of the Southwestern States, was a complete failure in the first year.

The species in table 1 might be compared with slash (P. elliottii Engelm.) and longleaf pine (P. palustris Mill.), which are indigenous to this area. Hand-planted 1-0 slash pine stock in old fields usually has better than 75-percent survival. Height growth on a typical old-field site averages about 0.5, 1.9, and 2.9 feet, respectively, for the first 3 years; the increase thereafter is nearly 3 feet per year to age 20 or beyond (1). Longleaf pine requires careful planting for good survival and this species is not generally grown in plantations. However, one planting not far from the trials reported here averaged 1.5 feet in annual height growth over the first 5 years, in spite of several years in the grass stage (2).

Figure 1.--This pitch pine, although not the tallest on the plot, was 2.4 feet tall at the end of 4 years in the field, and had grown to 3.4 feet when this photo was taken 4 months later.

Similar plantings of these non-native species have also been made in the Olustee Arboretum near Lake City, Fla., approximately 150 miles to the south. All but pitch pine were discarded as failures at the end of 4 to 8 years (4). Results from both plantings closely parallel, the major difference being that Corsican and ponderosa pine survived better in the George Walton trial.

The results from our trial, coupled with the evidence from Olustee, show that ponderosa, pitch, pinyon, Scotch, and. Corsican pine cannot be successfully grown for commercial purposes in south Georgia and north Florida.

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