



TREE DIAMETER GROWTH IN THE DRY LIMESTONE HILLS

C. B. Briscoe

Division of Forest Management Research

The dry limestone hill region of southwestern Puerto Rico, because of heavy, shallow soils and scant rainfall, is not farmed, and is recognized as an area best suited for the growth of trees. With a mean temperature near 80°F and with rainfall averaging no more than 30 inches annually and much less during dry years, the site is adverse even for tree growth. Studies on this area have been under way for several years to determine the diameter growth rates which can be expected.

The largest and most important native species appears to be úcar (*Bucida buceras* L.), which yields good post and structural timber. The most promising introduced species is small-leaf mahogany (*Swietenia mahagoni* Jacq.). Growth study of the two species was begun in 1944 on the Guánica Insular Forest. The úcar trees were naturally established and are of unknown age; the mahogany trees were planted in 1931.

After six years diameter growth of the úcar was found to average only 0.05 inch per year (1950 Annual Report), but the growth was thought to be atypical because prolonged droughts preceded measurements. Small-leaf mahogany grew nearly five times as fast during the same period.

In 1961 the thriftiest and most vigorous appearing trees of both species, 18 úcar and 22 mahogany, were measured again. Results are shown in Table 1 below.

Table 1. Growth of crop trees in Guánica Insular Forest, 1944-61.

Year	Mean crop tree DBH, Inches	Period	Periodic annual diameter growth, Inches
		Ucar	
1944	3.16		
1950	3.58	1944-50	0.07
1954	3.69	1950-54	0.03
1961	3.95	1954-61	0.04
		1944-61	0.05
		Small-leaf mahogany	
1944	3.97		
1950	5.41	1944-50	0.25
1956	6.06	1950-56	0.11
1961	6.35	1956-61	0.06
		1944-61	0.14

* Operated in cooperation with the University of Puerto Rico.

At the mean rate for the 17-year period úcar would require 80 years to produce a 4-inch tree suitable for fence posts; and the production of a saw log, would require 240 years. Small-leaf mahogany would require 23 years for the production of fence posts and 71 years for the production of a 12-inch saw log.

Only vigorous-appearing trees with crowns fully exposed to the sunlight were chosen for this study, assuming that their growth rates approached the maximum to be expected through silviculture. However, the periodic decline in the growth rate of the mahogany is so marked that it suggests competition among the trees as a cause. Thus current diameter growth, at least of the mahogany and possibly the úcar as well, may be increased by thinning.

Summarizing the diameter growth of the most promising native species in the dry limestone hills of southwestern Puerto Rico, úcar, and the most promising introduced species, small-leaf mahogany, is slow. However, there is some basis for hoping that thinning will speed growth rates, even for trees already well exposed to sunlight.

September 12, 1962.