Soil-Guayule Relationships

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More than half of the world's agricultural wealth is derived from products of plants originally obtained from the New World. The cultivation and improvement of these plants begun by the American Indians has been continued for several hundred years. Guayule (y-oo'-lay), _Parthenium argentatum_ Gray, is the only crop recently developed from the wild state which may assume prominence in American and world agriculture. Domestication and improvement of the shrub began about 1907, several years following the first milling of the wild shrub in Mexico. Plant improvement work, consisting largely of selection from many strains, was carried on in California, beginning in 1912, and later in Arizona. In 1925-26 operations were centered at Salinas, Calif. An intensive research program was launched in 1942 dealing with all phases of guayule improvement and culture.

The object of this investigation was to study plantation guayule under different soil conditions. Differences were measured by comparing pounds of rubber produced per acre on the several soils. Some 31,000 acres of guayule were distributed over California under different climatic and soil conditions. Smaller plantings were located in Arizona, New Mexico, and Texas.

GUAYULE BELT
NATIVE HABITAT

Guayule is indigenous to the Chihuahuan desert of Northern Mexico and the Big Bend region of Texas (Fig. 2). It grows in scattered patches of from less than one to several hundred acres in size. Plant size and density vary greatly, in part a result of harvesting and grazing practices, but also because of the environmental pattern throughout its range. Typically, guayule is a foot-slope or foothill growth where the very shallow and stony soils are developed from limestone rocks (Fig. 1A, B). It avoids gently sloping lands or valleys where the soils are deep, possibly because of competition with grasses and weeds for the limited moisture. Excess moisture during periods of flood is detrimental. Native guayule is a greenish-gray, spreading, low-growing shrub averaging about 20 inches in height. Weight of 20 pounds per shrub have been reported, but common weights range between 1 and 4 pounds. Lloyd (4) reports that the native shrub has a dual root system, that is, a tap root and a spreading shallow system of fine roots which pick up moisture from desert showers. This shallow root system (Fig. 1C) is not common for cultivated shrub. The plant is not abundant at altitudes greater than 7,000 feet.

CLIMATE

The northern limits of guayule production in the United States are determined...