The Natural History of Jojoba (Simmondsia chinensis) and Its Cultural Aspects

Simmondsia chinensis is unique in many ways. Endemic to the Sonoran Desert of Mexico and the United States, its broad, persistent, heavy leaves are unlike any of its associates. Its large edible seeds contain about 50% oil, which is directly used as a cooking oil and as a hair oil. The oil has excellent qualities for many industrial and medicinal uses. Chemically it is a liquid wax and by hydrogenation is easily converted to a hard white wax. Jojoba’s singular characteristics as a desert shrub, however, present many problems facing its development as a cultivated plant.

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Introduction

Jojoba, the gray box bush, is a drought-resistant, long-lived, evergreen, desert shrub bearing fruits like an acorn set in sepals. Usually bushy, it may grow to three meters in stature or mature only as a low mound two to five decimeters tall, depending upon its environment (Figs. 1, 2). The natural life span appears to be over 100 years and may exceed 200 years. A stem of a wild shrub four to five centimeters in diameter shows over 85 annual rings. This grew in the arid San Matias Pass of Baja California, where a year may pass without rainfall. It is, therefore, a shrub in space and a tree in time; Simmondsia chinensis (Link) Schneid. in botany.

Several writings have appeared on jojoba during the last 25 years announcing the presence of a liquid wax in the seed, its potential in industry, and the possibilities of the shrub as a cultivate (7, 8, 10, 12). More recently, Daugherty, Sineath, and Wastler (5) presented their survey of jojoba as a potential raw material source for industry. They fairly established an economic potential for the product. Because of limited information, however, much of the real character of the plant and its problems in cultivation have remained obscure. The following account presents in a brief or generalized way the writer’s study of the plant as a field subject together with his limited knowledge of the few attempts to cultivate it. The observations are based primarily upon a field study from March to October 1957 and upon less intensive periods of observation between 1946 and the present.
Wild Jojoba

The Natural Area. The natural area of jojoba is shown in Fig. 3 and comprises approximately 100,000 square miles between latitudes 25° and 31° North and between longitudes 109° and 117° West. This area closely approximates that of the Sonoran Desert as defined by Shreve (262). It occupies elevations between 2000 and 4000 feet, rarely going lower. It can be expected in the Sonoran Desert mountains generally between these altitudes, but it is lacking over large extents of plains and valleys. In Baja California (Fig. 4), however, it occurs down to sea level along the outer coast, in an environment outside the limits of the Sonoran Desert. This species extends as far south as the peninsular cape district, where it meets, but does not enter, the Tropical Short-tree Forest. Although jojoba has a wide ecologic range from sea level to 4000 feet altitude, its intolerances restrict it to specific habitats within the region. The plants are completely lacking in areas which appear ideally

Fig. 1. A very large male plant of jojoba in the Calentura valley of Baja California. The "trunk" is composed of many intertwined stems. The lower foliage has been browsed. (13). The population incidence within this area varies from a few individuals to 200 per acre. There are many small separate populations covering few to many acres and some extensive massive populations with millions of individual plants, as along the slopes of the Pinal Mountains of Arizona and upon the high desert plain of San Matias Pass in Baja California. In the Sonoran Desert jojoba