← Canaigre plant showing root growth.

Canaigre Tested

Not An All Purpose Crop for Arizona

By N. W. Gilbert
U. S. D. A.

Sixty years ago, canaigre held promise of becoming an important commercial source of vegetable tannin needed in leather manufacture. This native dock plant was found widely distributed in Arizona and the other border states. The possibilities of economic production of canaigre was one of the first projects of the University of Arizona Agricultural Experiment Station.

Roots were dug by hand from thousands of acres of desert land, hauled in wagons to the nearest railroads and shipped to tanneries in Eastern United States and in Europe. Acreages were planted at a number of locations in the border states, including nearly 2,000 acres on the Heard Ranch in the Salt River Valley. Extraction plants sprang up at several points in the Southwest.

Interest in canaigre died out around the turn of the century, however, because of the development of other sources of tannin, such as chestnut. Today the United States is dependent upon foreign sources, primarily Argentina, for 85 percent of its tannin requirements.

Modern uses of vegetable tannin include not only leather manufacture, but other industries, such as oil well drilling. At the present rate of use, the existing stock pile of chestnut wood will be exhausted within eight or ten years. After that, practically 100 percent of this nation's tannin requirements will have to be imported unless new domestic sources are developed. In view of present world conditions, the development of an adequate domestic source is strategically important.

Of the several possible domestic sources of vegetable tannin that exist, canaigre appears to offer the best prospects. It has a low water requirement and is adapted to soil and climatic conditions of the Southwest. It can be grown as an irrigated farm crop and lends itself well to mechanized production.

USDA Program

The U.S. Department of Agriculture began work on the development of canaigre as a modern cultivated crop on a limited scale in 1937. Ten years later, the program was intensified until at present a full scale research project is in progress under the leadership of the Bureau of Plant Industry, Soils and Agricultural Engineering. The Agricultural Experiment Stations of both Texas and Arizona are cooperating in the work. Project headquarters are located at the Mesa Experiment Farm.

Canaigre requires light, sandy soil. Consequenty, none of the actual experimental plantings can be made on the Mesa Farm and suitable land must be leased elsewhere. Currently, experimental plantings of the crop exist on about 50 acres near Queen Creek, Mesa, and Tempe, and on eleven acres near Portales, New Mexico, and Lubbock, Texas.

Former experimental plantings were made in Cochise, Pinal, Maricopa and Yuma Counties, as well as at points in California, New Mexico and Texas. These plantings demonstrated that canaigre may be grown under irrigation through a wide range of territory.

Canaigre may be grown either from seed or from roots. The seed, like that of lettuce, germinates poorly at high temperatures. In most seasons, however, it probably can be planted as early as September 15 in the Salt River Valley From seed, the crop may have to grow for two seasons before the most economical yield of high quality roots may be harvested.

During the first season, each seedling usually produces a single, carrot-like root. During the second season, these roots multiply in number, greatly increasing the harvestable tonnage and possibly the percentage of tannin.

However, during the hot summer months, from June 15 to October 1, when roots are dormant and the tops are dead and dry, the expense of controlling weed growth may be a serious obstacle to the growing of canaigre as a two-year crop. For this reason in particular, the possibilities of obtaining satisfactory yields of good quality roots at the end of one season of growth are being investigated.

20 Tons per Acre

Experimentally, on good potato ground on the Ernest Hawes ranch at Queen Creek, canaigre has exceeded 20 tons of roots per acre after two seasons of growth. However, in the same field over 10 tons of roots were harvested at the end of only one season. Thus, as a one-year crop the ground was occupied only for an eight-month period, while as a two-year crop at least 20 months were required from planting to harvest, and added expense was incurred in controlling summer weeds.

In the past two years, small scale nursery plantings have indicated that yields of 10 tons or more per acre may be expected. Selected material yielded at rates of 15 to 20 tons per acre, raising hopes that the breeding program now in progress may develop strains with yield potentialities comparable to potatoes.

At present, canaigre as a crop is entirely in the experimental stage of development. No commercial production exists and no price has been established, either on the roots or on the extract. Consequently, it is impossible to estimate the returns which a grower might expect from the crop.

Canaigre is not likely to become a high value crop, since it will have to compete with foreign sources. Probably also it may not be able to compete with ordinary farm crops on land having abundant irrigation water supplies.

It appears that canaigre can be grown on 1½ acre feet of water per acre on most soils to which it is adapted. Thus, it may find a place as an important farm crop on light textured soils having insufficient water for other crops.