ADAPTATION OF THE SUGAR BEET TO MEET THE NEEDS OF THE SUGAR INDUSTRY IN AMERICA

H. E. BREWBAKER

The beet sugar industry in America was entirely dependent on European sources of seed for its early development. The varieties then available were developed largely by commercial concerns; and although they were the result of intensive breeding work in producing yield, intermediate and sugar types, the selection work was done in Europe (12). It is not surprising, therefore, that these types, or commercial brands, failed to meet the specific needs of the American grower and sugar industry.

It is pertinent to record that, except for limited cooperative breeding strain tests in this country as early as 1925, the only serious attempt by any European seed producer to meet the specific varietal problems of the American industry was initiated at Brush, Colo., in 1934 and terminated in 1938.

During the first World War the American beet industry was faced with the heavy burden of providing seed for a quickly expanded acreage. Costly attempts were made to develop a domestic seed industry. This war-time seed emergency, coupled with the fact that sugar beet growers in America had been faced for years with two major diseases, namely, curly-top for the areas principally west of the Continental Divide, and leaf spot, *Cercospora beticola*, east of the Continental Divide, focused attention on breeding for varietal improvement and commercial seed production. The development of a self-sufficient domestic seed industry, largely by the overwintering method, as reviewed by G. H. Coons (4, 5), provided the final step needed to effectuate the improvement work in the United States by federal, state, and research agencies of the beet sugar companies.

In the history of plant breeding the development of curly-top-resistant varieties of sugar beets will rank among the important contributions. The curly-top disease is caused by a virus carried by the beet leaf-hopper, *Eutettix tenellus*. It was the principal cause of average yields (3) as low as 1.0 and 1.4 tons, respectively, for the years 1914 and 1919 in the California district, and 5.5 and 6.0 tons, respectively, for the years 1924 and 1926 in southern Idaho. Such low yields, which represent losses of from 60 to 90%, were leading to almost complete abandonment of factories in areas subject to frequent epidemics of this disease. The moderately resistant variety U. S. 1, released to growers in 1934, provided the first positive relief against this disease, seed being available that year for about 35,000 acres of commercial beets. Since that time, continued improvement has been made by the Bureau of Plant Industry, Soils, and Agricultural Engineering,