

RESEARCH IN THE DIVISION OF SUGAR PLANT INVESTIGATIONS  
U. S. D. A.

E. W. Brandes, Chief

E. W. Brandes, Principal Pathologist in Charge, Division of Sugar Plant Investigations, U.S.D.A., gave an informal, extemporaneous address on research of the Division, tracing the development of work on sugar beets from 1918 to the present.

The purposes and results of four main projects and numerous accessory projects were presented. The principal projects are: Study of the causes of reduced stands and other losses mainly due to disease; breeding for resistance to curly top; breeding for resistance to leaf spot, and investigation of principles involved in sugar beet seed production in North America.

Progress in solving these problems includes restoration to productivity of 100,000 acres of land by development of curly top resistant strains, inauguration of an American beet seed industry which now supplies nearly two-thirds of the national requirement and conserves millions of dollars that formerly flowed to central Europe for purchase of seed, definite advances in the development of strains of beets resistant to leaf spot and development of practices that curtail the losses heretofore caused by minor diseases.

The accessory projects mentioned were botanical investigations in the fields of plant anatomy, cytology and physiology, ecological studies in connection with curly top control, study of agronomic methods and plot technique, testing of sugar beet varieties by application of these methods, and studies in sugar beet genetics and biometry.

Some remarks were made on the organization of the U. S. Department of Agriculture in relation to functions of various Bureaus and Services other than the Division of Sugar Plant Investigations that give attention to problems of the sugar beet industry.

SUGAR AND WESTERN CIVILIZATION

Governor Henry H. Blood

Consideration of the human side of the sugar industry may enable the sugar technologist to see his work in its true perspective, to perform it more intelligently, and to find pride and joy in the service he and his associates are rendering to mankind. Although I am not unacquainted with this human side of the sugar industry, I know something about its beginnings in the West; something of the farmers' viewpoint; something of the processors problems. One hundred years ago this great basin district was a land where the deer and antelope played on the foothills and the buffalo roamed the plains--an arid land, bathed in sunshine, covered only with sage brush and sunflowers and such other vegetation as might exist along the water channels, or was able to withstand several months of summer with only an occasional shower.

The other day I participated in the relocation of a plaque commemorating the birth of irrigation as it is practiced in the modern west. The date on that bronze memorial is July 23, 1847, not yet ninety-one years ago. But even before Brigham Young passed through the gap in the mountains which we now know as Emigration Canyon, and told his followers, "This is the place," the advance guard of that band was endeavoring to plow and prepare for planting a soil so hard that it broke their plowshares. Necessity brought trial of something new. The new comers dammed one of the branches of a stream they later called City Creek and softened the soil by flooding it. Thus irrigation was commenced here. Irrigation has meant everything to the sugar industry in Utah.

We do not understand aright the history of the sugar industry in Utah unless we have some comprehension of the character, and viewpoint and determination of the early settlers of this state.

Pioneers were ambitious, adventurous, aspiring. They learned to depend on themselves and developed ingenuity in their daily tasks and in their relations with their associates. Eager to live their own lives and to advance their station and fortune, they were receptive to new inventions and new ideas--anything that would lead to a solid, enduring and high type of civilization.

Some of the arrivals in the first company to reach Salt Lake Valley were from Mississippi, and perhaps knew a little about the manufacture and the value of sugar.

Brigham Young, then governor of the newly formed territory of Utah, in his address to the Legislature of 1852, said: "Let home industry produce every article of home consumption," and again:

"Produce what you consume; draw from the native elements the necessities of life."

The Governor asked for passage of laws to protect local industries and to encourage manufacturing interests.

There was need for home production. It is recorded that one Captain Grant, a representative of the Hudson Bay Company from Fort Hall, Idaho, sold coffee and sugar at \$1 a pint. In Salt Lake forty cents a pound appears to have been a prevailing price for sugar. The Deseret News advised its readers to "let all trading shops severely alone, where they ask you forty cents a pound for candles, forty cents a pound for sugar and soap---and will only give you ten dollars a ton for hay." The latter medium of barter, the News said, had a fair market price of fifteen dollars, and would soon reach twenty dollars a ton.

The year 1852 was a noted one for several reasons in this mountain region and ambitious plans were afoot. In August of that year machinery arrived in Utah for the construction of a sugar factory.

I am indebted to the Utah Idaho Sugar Company and particularly to Mr. Scalley for most of the details in the following account of that venture, the chief vestige of which survives in the name of Sugarhouse, given to a thriving business center in the southeastern part of Salt Lake City, I quote from Mr. Scalley's notes:

"When John Taylor, one of the European missionaries of the Mormon church, learned of the strides made by the beet sugar industry in France, he and an associate, Phillip Delamar, persuaded the Deseret Manufacturing Company to purchase from Faucett, Preston and Company, of Liverpool, for \$12,500 a complete outfit of machinery for making sugar. This equipment, accompanied by the late Elias Morris, arrived in New Orleans in April, 1852, from where it was taken on another boat to Fort Leavenworth, Kansas. Here it was loaded into covered wagons drawn by fifty two ox-teams. (Another authority says 200 yoke of oxen). At that time the cost of hauling freight from the Missouri river to Salt Lake City was five hundred dollars per ton. From the river to Utah was a slow and painful journey, and it was not until late fall that the party conveying the machinery arrived, hungry and cold, at the Green River, Wyoming. There it was met by a detachment sent out by Brigham Young, and the remainder of the journey to Provo, Utah, where it had been decided to erect the sugar factory, was made in comparative comfort. Five hundred bushels of beet seed had also been sent with the machinery.

"However, the expense of the enterprise was more than the Deseret Manufacturing Company had expected. The machinery was, therefore, purchased by the Mormon Church and moved to Salt Lake City, where it was installed in an adobe building at the outskirts of the city, later known as Sugarhouse."

In 1853 additional machinery was received; a small crop of beets was raised, and the attempt made to produce marketable sugar. Right here sugar technology was sorely needed but, unfortunately, was not available. Undoubtedly, through lack of experience, technical knowledge of the manufacturing process and probably because of inadequate machinery, the effort failed. The factory produced only a syrup, due to the difficulty that was experienced in getting sugar to crystallize. The syrup was so sharp in flavor that (and here my authority uses quotation marks) "It would take the end of your tongue off."

The initiation of one factory does not make an industry; nor was Utah the only state in the Union, as you gentlemen will know, which did not succeed at first, and tried again. The settlers from Vermont, New York and other territory had had some experience with maple sugar; those from the south may have known about cane sugar production, and Utah was drawing its share of population from other sugar areas. Sugar cane and sorghum provided some substitute for the granulated product in molasses and even a variety of raw sugar. Meanwhile the study went on, and though railroad and other transportation improvements reduced the price of sugar, Utah still had men of vision who could realize some of the possibilities of home production of this essential of modern life.

Among these was Arthur Stayner, whom I recall very well. I remember seeing a container, in the possession of his son, Arthur, Jr., once my school teacher, said to hold the first refined sugar successfully produced in Utah. But Mr. Stayner did establish a mill at Farmington and later at Spanish Fork about 1886 or 1887, and produced sugar from sorghum cane. He was successful in obtaining a territorial bounty, and a diploma. His enterprise otherwise was not a commercial success; but he later turned his attention to beet sugar, succeeded in interesting the authorities of the L.D.S. Church and the Lehi sugar factory of the present Utah-Idaho Sugar Company is the result. That enterprise was commenced in 1891 and began production in November of that year, thirty-eight years after the Sugarhouse factory had been given its trial.

It is remarkable, perhaps, as the first sugar factory ever constructed using American-made machinery, previous attempts having relied on French or German machines. It is also said to have been the first to use beets grown by irrigation.

The first year the output was about 11,000 bags; by the third year this had been stepped up to 41,000 bags. Ultimately the factory more than paid its way, and about eight years after its construction the company began its program of expansion which has carried its activities into several states. Other states have surpassed Utah as beet sugar producers, but this state still ranks high, as you know.

The industry has its problems, to aid in their solution we look to you technologists for help and assistance. Your skill and vision and inventive genius have brought sugar manufacture to its present standing.

The field is yours, technologists. For what you have done we honor you and thank you. For what you may still do we shall be deeply grateful.

#### THE DEVELOPMENT OF THE SUGAR INDUSTRY IN UTAH

Heber J. Grant, President of the L.D.S. Church

President Heber J. Grant of the L.D.S. Church gave an extemporaneous address on the early struggles of those connected with the sugar beet industry in the West. He told of the establishment of a factory at Lehi, Utah, which was wiped out by the depression of 1883; of his endeavors to raise capital for building another factory and the final interest taken by Wells-Fargo Company and the late David Eccles. He eulogized the pioneers of the sugar beet industry and held out high hopes for its future development.

#### LOOKING FORWARD TO BETTER SUGAR BEET PRODUCTION MACHINERY

H. B. Walker

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Aristotle, the famous Greek philosopher, defined hope as a waking dream. For many years the producers and processors of sugar beets have lived in the hope that some genius, philanthropist, scientist or inventor might devise suitable equipment and machines, which would eliminate from sugar beet production problems, the back-breaking, tedious stoop labor which now seems to be necessary for growing this crop. Our progress in overcoming these problems has been slow. We have yet to find the talent and the method of attack to bring to reality this waking dream.

The sugar beet industry, however, has not attained the hopeless stage. This sugar beet machinery problem is very much alive and, therefore, still in the hopeful stage.