

THE SUGAR-BEET INDUSTRY IN KANSAS

by

TIBURCIO JOE BERBER

B. S., Kansas State College
of Agriculture and Applied Science, 1947

A THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of History and Government

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

1949

1.D
3465
F#
174/9
E 43
C. 2

Document

TABLE OF CONTENTS

PREFACE.....	111
CHAPTER I - A HISTORY OF THE SUGAR-BEET.....	1
CHAPTER II - THE SUGAR-BEET IN KANSAS.....	11
CHAPTER III - THE GARDEN CITY COMPANY.....	24
CHAPTER IV - SOME FEATURES OF SUGAR-BEET PRODUCTION.....	43
ACKNOWLEDGMENT.....	57
BIBLIOGRAPHY.....	58

PREFACE

The United States is the greatest sugar consuming nation in the world. It is estimated that the average individual consumes 65 pounds of sugar per year. The manufacture of sugar from sugar-beets is an industry that is very much an infant in the United States. Kansas, with its rolling plains well-suited for agriculture, is one of the several states that produces and manufactures beet sugar.

Yet, one of the least known, but most important industries in the State is the sugar-beet industry. Hardly anyone outside the Arkansas River Valley near Garden City knows that Kansas has one of the largest beet sugar refineries in the country, and that sugar-beet farming supports thousands of Kansans. This study presents some significant aspects of one of Kansas' greatest industries. The major emphasis is placed on the evolutionary development of the sugar-beet industry in Kansas. The final concentration of sugar-beet production came to be in the Arkansas Valley around Garden City. The sugar refinery at Garden City is the heart of the industry.

Sources of material which were found to be most useful in this study were the Reports of the State Board of Agriculture, newspapers, and personal correspondence. Also, personal interviews with the Garden City factory officials and beet-growing farmers proved valuable. The author of this study was able to draw on personal experience as a laborer in the beet fields and

as a resident of the Arkansas Valley beet area for most of his life.

CHAPTER I
A HISTORY OF THE SUGAR-BEET

The sugar-beet came to the United States from Europe. The development of the sugar industry the world over has a fascinating history that reaches back far in the mists of time. The history of the sugar-beet industry in the United States is only a part of the story of sugar itself. So it is that, if the position of Kansas in sugar-beet production is to be shown in its proper perspective, then the story must be told from the beginning.

Primitive man satisfied his sugar hunger with honey and plants containing sugar. Sugar cane was apparently known in India and the rest of the Orient hundreds of years before the Christian era. Also, the Old Testament mentions it twice.¹ The art of crystallizing sugar was discovered in the fourth century in Europe. However, refining, in the modern sense, was not practiced until the fourteenth century. Sugar became an article of household use during the Elizabethan period. Prior to this time the sweet crystals were used largely for medicinal purposes.

The Arabs became acquainted with sugar when they over-ran Persia, moved across north Africa, and into Spain. Crusaders, in the twelfth century, found sugar in Tripoli, Mesopotamia, and Syria. Once having acquired the sweet taste, they were in no mood

¹ "The Sugar Beet in the United States." The Silver Wedge, (Washington, D.C.: U. S. Beet Sugar Association, 1936), p. 10.

to discontinue its use. The Italian port of Venice was especially well located to handle the trade of sugar and spices from the East. As the demand for sugar grew, prices were increased until all Europe grumbled impatiently and angrily. However, Venice continued to retain a monopoly on the trade by taking advantage of opportunities whenever they arose.

One such way offered itself in 1420 when an unnamed inventor perfected an improved method of refining. Venetians determined to control the process, and they generously rewarded the inventor with an amount equivalent to \$120,000, which was easily ten times more than it cost to finance the first voyage of Columbus across the Atlantic.²

Columbus brought sugar cane to the New World where it became firmly rooted in the West Indies. Cane had been grown in the tropical areas of the New World many years before sugar extracted from the sugar-beet made its first appearance in Europe. This does not mean that sugar-beets were unheard of before this time because many scholars believe that beets were eaten for food centuries before Christ. The laborers who piled up the pyramid of Gheops were supposed to have eaten the beets.

There is an inscription in Egyptian characters on the pyramid, "Herodotus wrote," which records the quantity of roots, onions, and garlic consumed by laborers who built it; and I perfectly well remember that the interpreter who read the writing to me said the money expended in this way was 1,600 talents of silver.³

The literature of the Middle Ages is filled with stories of the beet and its importance in the diet of people. Although it was known that the taste of the beet was sweet, no one ever really

² Ibid., p. 10.

³ Ibid., p. 12.

looked at it as being sugar as is the case today. It was not until 1747 that Andreas Marggraf, a German chemist, proved that the beet root stored a sugar identical to cane sugar. Nobody was very excited because it was merely looked upon as another scientific laboratory trick. Forty years later Frans Karl Achard, a pupil of Marggraph, planted a small patch of beets and succeeded in obtaining sugar from them. Immediately, the French government looked into the situation as did governments of other leading countries.

Frederick William III, King of Prussia, became interested in the work and provided funds for the erection of the first beet sugar factory at Cunern, Silesia, in 1802. The French continued to be interested, but lacked technical knowledge and experience to carry out the enterprise. France was in deep earnestness because the Napoleonic Wars found them cut off from the sugar they needed from the West Indies. A chemist, Benjamin Delessert, erected a small factory and in January, 1811, made a quantity of well-crystallized beet sugar. Napoleon was deeply interested in the discovery which led to an order which he dictated to his Minister of Council.

The Minister of Interior will make a report to be sent to the Council of State, in which the advantages of developing the manufacture of beet sugar will be included...All steps shall be taken to encourage this culture...The Minister will take steps to make trials in a very extensive manner and to establish schools for teaching the manufacture of beet sugar.⁴

⁴ Ibid., p. 16.

Thus, did the sugar-beet gain strength under Napoleon who spent hundreds of dollars for its development from plant seed to sugar.

The industry born of economic necessity was soon to experience difficulties. The downfall of Napoleon at Waterloo was also the downfall of the sugar-beet industry in France. The West Indies trade flourished again, prices fell, and the new beet factories erected under the Napoleonic decree operated no longer. Yet, even in these desperate straits the industry did not become decadent in Europe. A few brief years had seen the definite value of the beet in agriculture. Little by little, the process of manufacture was improved, and this in turn encouraged improvements in beet production.

The first attempt to establish the sugar-beet industry in the United States was made by the Beet Sugar Society of Philadelphia in 1836. The Society, having heard of the success of the industry in Europe, decided to send a representative to France to make a first-hand investigation. For this purpose they selected Mr. James Pedder, a gentleman who had, both here and in Europe, given much attention to the subject. After six months of study, Mr. Pedder delivered an enthusiastic report. His report was favorable as he had been deeply impressed by the crop and the farming methods he had observed. He predicted a future in the industry with America leading the way as she had already done in cotton, rice, and tobacco. The Society accepted Mr. Pedder's work with praise but did nothing about it. Not until years later, and then at Northampton, Massachusetts, was the first beet sugar produced in the United States.

Meanwhile, there were other people who had given attention to the developments on the Continent. New Englanders in particular had become interested as early as 1837 when the work of Edward Church appeared called "Notice on the Beet Sugar." This gentleman had gone to France in 1830 to study and establish a sugar factory on his estate near Paris. A revolution had changed his mind so he returned to his farm in Kentucky. There he established a warm friendship with Henry Clay, whom he interested in beet sugar. Later he moved to Northampton where he continued to talk about the possibilities of beet-growing.⁵

The actual Northampton factory was established by David Lee Child who had spent eighteen months in the sugar factories of Europe in consultation with manufacturers distinguished for science and success. The operations began in 1838 and ended in 1839, but not before Child had written a book telling of the factory operations.

The general result of the first season was unsatisfactory. The quantity of the sugar obtained, except on particular days, when the operations were upon select material, was too small; the molasses super-abundant and very bad...The sugar is not inferior in flavor or appearance to West Indian muscovados.⁶

Child's factory produced 1,300 pounds of sugar that was none too good and then folded up. This experience did not encourage such sugar-beet growing and manufacturing. More than a decade passed before the production of sugar in continental United States reasserted itself.

⁵ Ibid., p. 20.

⁶ Loc. cit.

In the 1830's and 1840's a new religious movement, Mormonism, was growing in the United States. Led by Brigham Young, the Mormons drove westward across the prairies to Utah. They determined to create, so far as possible, a self-sufficient community.

Thus, when John Taylor, one of the European missionaries of the Church, learned of the strides made by the beet sugar industry in France, he persuaded the Desert Manufacturing Company to buy, at a cost of \$12,500, a complete sugar manufacturing outfit...The machinery arrived in New Orleans in April, 1852, and was taken by boat to Fort Leavenworth, where it was loaded into covered wagons drawn by fifty-two ox-teams.⁷

The Desert Manufacturing Company, which had promoted the industry, became insolvent because of the many unexpected expenses. The Mormon Church purchased the machinery and moved it to Salt Lake City where it was installed at Sugar House Ward. The courageous attempt was not a success; the factory produced only a syrup, and the project was finally abandoned in 1855.

Colorado apparently was interested in sugar during the exciting period of the Gold Rush, for as early as 1865 Peter Magnes, a German immigrant, had prophesied: "If we had beet sugar factories in Colorado, I imagine Colorado farmers would produce more gold than all the mines in the mountains."⁸ Magnes had his prophecy fulfilled. Colorado farmers, during the first quarter century of beet culture, were paid more for their beets than the total value of all metals taken from the mines in the state. Today, the yearly output of beet sugar has many times the value of all the gold,

⁷ Ibid., p. 22.

⁸ Ibid., p. 23.

silver, and copper taken from the mines of Colorado. However, it was not until the turn of the 20th century that Colorado saw her first sugar-beet factory in operation.

In 1864, the Gennett brothers, who were Germans living in New York, became interested in the sugar-beet industry. They purchased 2300 acres of prairie land at Chatsworth, Illinois, and established a factory there in 1866. The mill had a capacity of fifty tons a day, but it was able to extract only a small part of the sugar from the beets. A series of unfavorable years forced the company to move to Freeport, Illinois, then to Black Hawk, Wisconsin. All attempts failed, partly because of the indifference of the farmers toward the whole industry. Indeed, between 1838 and 1879, failure overtook many small sugar factories that had been erected in Maine, Massachusetts, Delaware, Wisconsin, Utah, and California.⁹

Again two Germans, by the name of Otto and Bonestell, erected a small beet plant at Fond des Lac, Wisconsin, only to abandon the enterprise. Otto went to Alvarado, California, in 1870 where he became associated with E. H. Dyer. To Dyer goes the credit for establishing the beet sugar industry in the United States on a successful basis. This was not accomplished without a series of failures, but finally he did demonstrate that beets could be grown with a profit. Dyer and Otto erected a factory at Alvarado that did not pay for several years.

⁹ Franklin S. Harris, The Sugar-Beet in America, (New York, The Macmillan Co., 1894), p. 18.

The \$125,000 factory which they erected produced 250 tons of sugar in 1870, 400 tons in 1871, 560 tons in 1872, and 750 tons in 1873. The plant did not pay and was later moved to Santa Cruz County.¹⁰

Finally in 1879, the factory was re-established on a profitable basis, and is generally regarded as the first successful sugar-beet factory in the United States. It is still in operation. Charles Sprehals built the second successful sugar-beet factory at Watsonville, California, in 1889. Thus, in 1889, there were two beet sugar factories in the United States, both of them in central California.

Until the 1890's there were many other unsuccessful attempts to establish the industry in the United States. The failures were due to various causes: lack of experienced beet-raisers, poor quality of beets, poor machinery, and general lack of interest in the new industry.

About this time the Oxnard brothers interested themselves in the sugar-beet industry. They went to Europe and made careful studies while there. In 1890, they built a factory at Grand Island, Nebraska. Then in 1891 they built a factory at Norfolk, Nebraska, and also one at Chino, California. These factories served to arouse interest in the industry over a wider section of the country. From this time on the sugar-beet industry grew steadily with its development stimulated by favorable legislation. The Sugar Bounty Act of 1890 gave a big boost to the industry by encouraging farmers to grow sugar-beets with the federal govern-

¹⁰ Loc. Cit.

ment paying two cents on every pound of sugar grown from sugar-producing crops. In 1894 it was repealed by the Wilson Act which was not so favorable to beet growers. The passage of the Dingley Act in 1897, which taxed imported sugars heavily, helped the beet sugar industry a great deal. Favorable reports on the new industry prompted the United States Department of Agriculture to urge better beet culture. Government recognition resulted in government investment. The Department of Agriculture began to make an intensive study of areas in states where sugar-beets might be raised successfully. The nation over, largely through the Department's determination, awakened to the potentialities of beet sugar. The United States had always imported far more sugar than she produced at home. The idea that the nation might become self-sufficient in a very important commodity caught fire quickly all over the country.

In 1892 there were only a half dozen factories with an average output of 13,000 tons of sugar, but by 1902 there were 41 factories producing more than 2,000,000 tons.¹¹ In 1912 there were 77 factories operating in the United States, and by 1915 the number had increased by only two. This period of slowness in factory building was caused mostly by the passing of the Underwood-Simmons Tariff Bill in 1913. The bill reduced the tariff on imported sugar 25 per cent after March 1, 1914, and provided that all the duty should be removed after May 1, 1916. However, this last provision was amended before it went into effect.¹² The reten-

¹¹ *Ibid.*, p. 19.

¹² *Ibid.*, p. 20.

tion of the tariff plus World War I greatly stimulated the growth of factories in 1917. The high price of sugar, resulting from the war, made it possible for the farmers to get more money for their beets. Naturally, this called for more beet-growing which brought in a demand for more factories. At the present time there are 99 factories from Ohio west to California. Colorado has 18; Michigan, 16; Utah, 14; California and Idaho, 9 each; Montana, 4; Wisconsin and Iowa, 3 each; Minnesota, 2; and 1 each in Kansas, Indiana, Washington, and South Dakota.¹⁵

¹⁵ "The Sugar Beet in the United States," Op. Cit., p. 25.

CHAPTER II

THE SUGAR-BEET IN KANSAS

Kansas first made sugar from beets in 1889 and 1890 at the sugar plant in Medicine Lodge, Kansas. The Medicine Lodge experiment was due largely to the efforts and enthusiasm of Henry Heintze, sugar-boiler and superintendent of the Medicine Lodge Sugar Works and Refining Company. His practical experience in sugar-beet work in German methods made him thoroughly familiar with the job he held at Medicine Lodge. Heintze secured seed from Germany and planted 4.7 acres near the sorghum-sugar factory in 1889. The yield was about 60 tons of cleaned beets which produced about 10,000 pounds of sugar and 380 gallons of syrup. The company reported that it was satisfied with the results, and that, with proper machinery, the sugar-beet industry would succeed in Kansas. Also, the favorable weather would be very valuable in the beet production. Every load of beets was comparable to that of beets grown elsewhere in the United States and abroad.¹ A still larger return would have been obtained if the factory had been equipped with the proper machinery for slicing the beets and treating the juice according to the report of the State Board of Agriculture.

An attempt was made to secure a crop of about 100 acres of

¹ George F. Kelly, "The Sugar Industry of Kansas," Seventh Biennial Report of the Kansas State Board of Agriculture, 12:143, January 15, 1891.

beets at Medicine Lodge again in 1890. However, contracts and instruction specifications were not closely adhered to. Even so, the harvest this time was 290 tons, from which 48,260 pounds of sugar were obtained. A test of 15.25 per cent sugar content was given to the experimental crop. The company immediately stated that they would be willing to enlarge their plant if the farmers would raise sufficient crops to meet the company's expenditures. The factory management changed ownership before the next season with the enthusiasm eventually dying down completely.

The idea of sorghum-sugar was still prevalent in the state with some thought of combining the manufacture of both beets and sorghum at the same place.

The sorghum-sugar factory at Ness City, Kansas, planted several acres in beets in 1890, but the factory was burned in August, and the only result was a very satisfactory analysis of the beets grown. The Topeka sorghum-sugar factory reported a net profit of \$11.60 per acre on a small crop of beets.²

The possibility of sorghum for sugar-making purposes was beginning to subside a great deal during the last decade of the 19th century. In its place sugar-beets were making a determined bid for recognition as a staple sugar-producing crop.

There were other experiments tried in different sections of the State. Kansas State Agricultural College conducted experiments in sugar-beet growing on the college grounds in 1890. However, the beets grown at the college gave an unsatisfactory an-

² Geo. B. Harrison, "The Sugar-Beet Industry in Kansas," 15th Biennial Report of the Kansas State Board of Agriculture, 80:209, June, 1907.

alysis. Nearby Topeka and areas around Newton grew beets of fairly good sugar content. Experiments by the college were extended in 1891 on a small scale. The experiments were under the direction of the State Board of Agriculture, and many localities were visited by a representative of the college department of chemistry. Thus, the plan for growing sugar-beets was explained to the farmers by first-hand accounts. The experiments were conducted on a small basis through the season of 1893. Analyses were then not made again until 1897, when once again the sugar-beet growing experiments were undertaken through extensive research by the Kansas State Experimental Station at Manhattan, Kansas.

Realizing the importance of intensive and diversified agriculture, this department began answering the question, "Can rich sugar beets be grown in Kansas?", some eight years ago, and continued it for several years. The beets produced were not of a high order of excellence, due in part doubtless to improper culture. With the revival of interest in the subject last year we again took up the work, this time in connection with the U. S. Department of Agriculture. The station received 200 pounds of seed from the Department. We applied for a larger amount but this was adjudged to be our proper quota.³

The growing importance of the beet sugar industry was recognized everywhere there was agriculture in the United States. Particularly in the Mid-West were the States of Kansas, Nebraska, and Colorado all eager for a try at the new sugar crop. The Federal government saw fit to get beet projects started by working direct-

³ J. T. Willard, "Sugar Beets," 11th Annual Report of the Kansas Report of the Kansas State Agricultural College Experiment Station, Bulletin No. 78, p. 65, April, 1898.

ly with and through the state agriculture experiment stations and state agricultural colleges. Kansas, with Dr. J. T. Willard as head chemist in charge of experiments at the Kansas State Experimental Station at Kansas State College, was very fortunate in having such an outstanding man to lead the way. It was largely through his efforts that the careful fact-finding experiments were made in the State of Kansas.

The seed received from the United States Department of Agriculture in 1898 was distributed to 396 farmers over the state. Directions for sampling and forwarding were sent also. The different farmers were asked to send samples of 10 beets each by freight. Later, due to a conflict with the provisions of the postal law, six beets in three packages not weighing over four pounds were to be sent instead.

The faith of the people in the efficiency and care of our postal service received ample confirmation in this work. From half a dozen to half a bushel of loose beets mixed with weeds of strings and newspaper were received daily. Not infrequently too, well-packed samples would be received with no name attached.⁴

One-hundred fifty-six persons of the 396 receiving seed sent beets with legible names; 104 had no beets to send; and the remaining 133 were never heard from. The beets were, in almost all cases, analyzed the day of arrival at the experiment station. Tables were kept filled with data recording the grower, county, serial number, date of planting, kind of soil, average weight of beets, specific gravity of juice, and final purity of juice. The experiment station recorded the average gross weight of the beets

⁴ Ibid., p. 66.

as being 1.51 pounds, and average coefficient purity of juice as being 1.33. The actual results of this first test experiment as far as average percentage of sugar in the juice was concerned was better than the later experiments.⁵

Willard's report on the state-wide experiment stated that the quality of beets in the State of Kansas would improve with better culture. The influence of climate did not tend to show up from the first results, but later Willard changed his mind after future experiments. Kansas may be said to have been in a transition stage at this time with the farmers gradually getting away from one or two stable crops. The general advice from the state experimental station was that Kansas could definitely grow sugar-beets, but that no great haste should be made in investing capital without assurance of good business.

We need healthy growth of industrial enterprises, but no voting bonds for expensive experiments. A beet sugar factory costs a great deal of money, and it requires much besides good beets for success. Cheap fuel, a great abundance of water, cheap limestone, and convenient markets are prominent essentials. To these must be added a hearty cooperation between the beet producers and the sugar manufacturer.⁶

It was the belief of the Kansas State Agricultural Experiment Station that an important function of the station was to guard the people from unwise and disastrous ventures.

The sugar-beet experiment continued very much the same again in the season of 1899. Beet seed was sent out to different farmers for the purpose of making isolated tests under unusual cir-

⁵ Ibid., p. 74.

⁶ Ibid., p. 76.

circumstances. The same difficulty in obtaining valuable information regarding the sugar-beet producing capacity of the state by voluntary culture still existed. However, the Department of Agriculture at Washington, D. C., continued to be interested and sent seeds, literature, and much other useful information. The influence of climate upon beet production became recognized as being of highest importance. The experiment station at Kansas State College held the view that it was very probable Kansas had too high a summer temperature and too little summer rainfall for sugar-beets. The Department of Agriculture published a map of the United States showing the location of a temperature belt for the summer months. The belt did not touch Kansas at all with its nearest approach about 60 miles from the northwest corner. In this general region the belt generally ran a northeasterly direction.⁷ The ultimate conclusion was that the northwest corner of the State was the coolest; the southeast corner the warmest. Therefore, according to the best beet-growing temperature in Europe, the counties of Kansas would run from southeast to northwest in arrangement with their probable favorableness for producing sugar-beets.

Temperature was not the only climatic consideration given research by the experimental station at Manhattan, Kansas. Rainfall was equally as important. The western and northwestern part of the state needed more rainfall, and irrigation seemed to pre-

⁷ J. T. Willard and R. W. Clothier, "Sugar Beets," 12th Annual Report of the Kansas State Agricultural College Experiment Station, Bulletin No. 88, p. 5, April, 1899.

sent the solution. The two test years had shown that the sugar-beet required a good supply of water during the early and middle part of the season, followed by a period of little water before harvest.

The Kansas State Experiment Station planned again for a third successive season of sugar-beet planting on a state-wide basis. This time, however, the seed was to be furnished to farmers in representative regions of the state who would grow only one-fourth or one-half an acre of beets. They were to keep an accurate account of all expenses, and weather charts. Also, groups of farmers of six or more throughout the state would cooperate to test their respective neighborhoods for beet-producing power.

The final report on these early experiments was published in June, 1901. It showed the production of beets the previous season with percentages of sugar in the different states. New York had 10 to 17.65 content; Nebraska, 13.5; Indiana, 13.7; Michigan, 14 to 15; Washington, 18; California, 17; and Colorado, 17 to 22. Kansas had a content of 12.50.⁸ The average results obtained in Kansas during the four years 1898-1901 were lower than in any of the States referred to above. The chemical department at the station arrived at the conclusion that, unless beets could be grown with a certain degree of certainty, it would be a waste of capital to establish the beet sugar industry in Kansas to any

⁸ J. T. Willard and E. W. Clothier, "Sugar Beets," 14th Annual Report of the Kansas State Agricultural College Experiment Station, Bulletin No. 103, p. 285, June, 1901.

great extent. It was also concluded that the eastern half of Kansas was not adapted to the production of beets rich in sugar. Spring and summer rains were declared sufficient, but the months of July and August produced little or no rain that was vitally important to a good beet crop.

Our climate cannot be materially modified. It seems to the writer that the only part of the state which offers real climatic advantages for sugar-beet production is the western part, where the natural rainfall would be entirely insufficient, and the irrigation water applied could be gauged to the seasonal requirements of the crop.⁹

Thus, the Department of Agriculture could see no use of expending funds on trials which would not lead to the establishment of a sugar-beet industry in the state. Thereafter, all experiments were to be conducted only through the State and Agricultural Experiment Stations and private groups of individuals.

The total world's production of sugar for the season of 1889-90 was more than six and one-fourth million tons (6,355,580), or 12,711,160,000 pounds. There were about 7,700,000,000 pounds from beets and 5,100,160,000 pounds from sugar cane. Germany produced the largest amount of beet sugar, 1,342,000 pounds. The United States at this time was very much an importer of sugar with more than 1,325,000 tons being imported per year. Kansas alone required about 70,000,000 pounds to supply its population. Mr. George F. Kelly, State Agricultural Inspector appointed by the State Board of Agriculture, in his annual report to the Board readily observed that it would require a large increase in the

⁹ Ibid., p. 285.

output of factories in Kansas to supply even the demand of home consumption.¹⁰ His report went on to say that Kansas with good soil, climate, and cheap lands was in a favorable position for future sugar-beet production.

A real boost for the new sugar industry came from the passage of the federal Sugar Bounty Act in 1890, which gave two cents a pound bounty on all domestic beet-sugar.¹¹ The Kansas State Legislature had already passed an Act in 1887 that allowed a bounty of two cents a pound upon each and every pound of sugar manufactured from beets or sorghum or other sugar-yielding canes and plants. The Act of 1887 was amended in 1891 by another State Act which provided for a bounty of three-fourths of a cent per pound on sugar. Again in 1901 the State Legislature passed a Kansas Bounty Law that was a further step forward for the industry as the State paid one dollar per ton upon beets grown in Kansas and actually used for sugar manufacturing.

A bounty of two cents a pound had been paid under the statute of 1887 upon the beet sugar made at Medicine Lodge, but the law of 1901 differed in paying the bounty to the grower instead of the manufacturer.¹²

In the spring of 1901 the beet growers of Hamilton, Kearney, and Finney counties were encouraged by the establishment of a beet factory at Rocky Ford, Colorado, and entered into a contract with the American Beet Sugar Company which owned the factory. These

¹⁰ Kelly, Op. Cit., p. 146.

¹¹ Mrs. Henry Block, "The Sugar-Beet Industry in Kansas," 14th Biennial Report of the Kansas State Board of Agriculture, 14:654, June, 1905.

¹² Harrison, Op. Cit., p. 909.

counties were to grow beets for this firm, and they were also subsequently encouraged by the state bounty previously mentioned.

In 1902 seventy-five growers in Finney, Hamilton, and Kearny counties shipped to the American Sugar Beet Company 4250 tons of beets harvested from 439 acres. The average yield was 9.68 tons per acre. The bulk of this crop was raised north of the towns of Lakin and Deerfield, Kansas. The general average sugar content was 17.64 per cent. This was not a perfect season for the crop, but it proved to be the most satisfactory yield for the three early large-scale seasons of 1901, 1902, and 1903. The third season in 1903 was a disastrous one for the western sugar-beet growers of Kansas. All crops in this region were hurt, with the melon crop at Rocky Ford, Colorado, injured even worse than the sugar-beets. The same three counties in western Kansas had planted about 8000 acres of beets which once again had been contracted for the company in Rocky Ford. The beet crop was ruined because of below freezing weather in April and May, which saw the mercury drop to an unusual low. Upon replanting the beets, the grasshoppers preyed on the young crop as did a blight known as curly top. As a result of all these discouragements, little bounty was paid in those counties.

Of the appropriation of \$10,000 made by the state legislature in 1901 to pay a bounty on sugar-beets grown in Kansas, only \$5997.97 was expended. Of the \$10,000 appropriated for the same purpose by the legislature of 1903, only \$696.00 has been expended for bounties for beets grown in 1903, and under the provisions of the law the balance of \$9344.40 is available for payment on beets grown in 1904. This fact should stimulate our beet-growers to enter into the business

the coming season on a much larger scale than ever.¹³ The failure of the beet crop in 1903 did not check the progress of the new sugar-beet industry for, in 1904, the harvest exceeded 5000 tons in western Kansas for the first time. The yield was 6380 tons from 472 acres, increasing from the 5.18 tons per acre in 1901 to 13.51 tons in 1904.

Mrs. Henry Block, a resident of Syracuse, Kansas, was appointed by the State Board of Agriculture to do a research report on the activity of the new sugar-beet industry in western Kansas. Mrs. Block, in presenting her report to the State Board in 1904, discovered that the average sugar content found in southwestern Kansas during the three years of 1901, 1902, and 1903 was more than 17 per cent. Perhaps a trifle overzealous in her enthusiasm, she nevertheless did a great deal to encourage further beet projects.

At our altitude of 3000 feet above sea-level the nights in summer are cool, a fact no doubt contributing to the extra-ordinary sweetness of the beets grown here.¹⁴

The possibility of annually feeding thousands of sheep on sugar-beets in the Arkansas Valley was not overlooked by the growers. Many people thought that sugar-beets could be fed profitably to horses, which are presumably sweet-toothed animals. Still, there were others who reasoned that the beet culture needed such intensive farming that many farmers would refrain from growing sugar-beets in the near future. They reasoned that a man accus-

¹³ Block, Op. Cit., p. 652.

¹⁴ Ibid., p. 653.

toned to the livestock and farm crop business would not likely become an enthusiastic beet grower in one season. When it came to getting down on banded knees and thinning beets, the average ranchhand would balk. In other words, the average laborer would consider sugar-beet culture below the dignity of normal employment. Upon these pro and con assumptions it was evident that the future of the sugar-beet industry in Kansas would depend largely upon inducing a particular class of people to settle upon the Arkansas Valley lands. These people would be willing to work the land in the proper way that would require much intensified farming. Through the possible use of irrigation and the progressive experiments in the new industry by the men who were not afraid to work, the future looked very bright indeed.

Thus, the claim that at least some portions of Kansas were well adapted to the profitable growing of sugar-beets for sugar-making seemed to be verified by the experience of the growers in the three counties of Finney, Kearny, and Hamilton. Kansas was popularly supposed to be located just beyond the boundaries of the so-called sugar-beet belt, but it had been proven that beets of excellent quality could be raised within Kansas borders.

Meanwhile, the counties of Cheyenne, Rawlins, and Decatur in northwestern Kansas harvested about 1800 tons of beets in 1904. These counties marketed their crops at the factories in Grand Island and Ames, Nebraska. While the yield and sugar content of these three counties was good, the distance from a factory was a distinct handicap to profitable sugar-beet growing. In 1905 the harvest in that section of the state was only 574 tons. The 1905

harvest in the Arkansas Valley was 8032 tons, which was purchased by the new factory built at Holly, Colorado. This was an increase of 35 per cent over that of any previous year. The future of the sugar-beet industry looked so good that a group of Colorado capitalists began to make an investigation of the region around Garden City, Kansas.

CHAPTER III

THE GARDEN CITY COMPANY

The only sugar factory in all of Kansas, owned by the Garden City Company and located a half-mile west of the city, cut its cornerstone in Kansas history in 1906. Today it influences the farm economy of the state by holding a strip of land stretching from Coolidge on the west to Great Bend on the east and reaching to Scott City and Ness City on the north.

Since 1905 the Garden City Sugar Company has had much to do with the development of the Arkansas River Valley in southwest Kansas. No other concern has spent as much money in improvements in and around Garden City. The great irrigation system in the Garden City district has progressed rapidly under the sugar company's direction. The company built the sugar factory, an alfalfa mill, the Garden City Western Railroad, and an electric power plant. It has also built electric power lines through the valley making it possible for the farmers to operate under modern agricultural methods. Western Kansas has had its ups and downs during the past forty years. Nonetheless, the sugar factory has been in operation every year, and has put into circulation on an average of more than a million dollars a year.¹

The Garden City sugar refining factory was founded in 1906 by the Carleton-McNeill-Penrose syndicate of Colorado which had

¹ Leola Howard Blanchard, Conquest of Southwest Kansas (Wichita: Wichita Eagle Press, 1931), p. 389.

already established several factories in Colorado. The first movement toward securing a beet sugar factory at Garden City is told by Menke, one of its early promoters.

The land we sold to the sugar company was bunched up by Charles Schneider, Ed West, and myself early in the spring of 1902. We first purchased the Great Eastern Ditch and then bought about 12,000 acres of land including the townsite of Deerfield in Kearny County, Kansas. Nearly all of this land consisted of abandoned farms along the Great Eastern Ditch and nearly all of it was unimproved. Later on we interested George W. Swink of Rocky Ford, Colorado, and sold him a fourth interest. Mr. Swink was one of the promoters of the Rocky Ford sugar factory.²

These four gentlemen carried the project along and with the assistance of U. B. George, cashier of the First National Bank of Garden City, succeeded in getting financial backing. In May, 1905, several men from Colorado Springs, Colorado, looked over the new project. A proposition was made and approved with part of the agreement being to build a sugar factory at Garden City.³

A thorough investigation was made with plans emerging to finance a sugar factory, improve ditches, and build a reservoir. A number of prominent men were interested in buying securities. Among them were Palmer of Colorado Springs and Governor Dodge of Denver, Colorado. Garden City and land owners of Finney County responded to promote the industry in every way. The Santa Fe Railroad also contributed money equivalent to half of the cost of the freight. This was indeed a great help to the young industry. Soon farmers, beet growers, and dairymen moved into the county and bought or leased land.

² Ibid., p. 329.

³ Ibid., p. 330.

When the sugar factory interests finally decided to locate a factory at Garden City, they asked the people to give them a bonus of \$30,000 and get them 12,000 acres of beets. Public spirited men, such as R. M. Lawrence, D. R. Menke, George Finnup, E. G. Finnup, J. E. Baker, U. M. Kinnison, George Boyd, J. U. Lawrence, and many others served diligently on a committee to take donations of land and money. The sugar factory agreed to take the various tracts of land at a fixed price. So the deeds were made to the sugar company.

In June, 1905, the first land was actually purchased for the first sugar-beet factory in the state of Kansas. In September of the same year, a company was organized, and a month later the ground was broken for the factory. Contracts were made with farmers for more than 6000 acres of beets. The company expended \$3,000,000 initially in the construction of the factory, purchase of lands, improvements on land holdings, and in the building of irrigation systems. The factory was built with the most modern equipment known at that time.

A mile west of this city is being built one of the finest sugar factories in the United States. Brick, six stories high, cement foundation, structural steel, 7000 feet long with great dumps on concrete foundation, long sheds and warehouses, the immensity of the factory is something unexpected out here on the prairies of western Kansas.⁴

The new sugar-beet factory was equipped with the Steffens process, the best modern method known for the extraction of sugar from beets. At the time of construction the factory had equipment

⁴ Kansas City Star, September 23, 1906.

equal, if not superior, to any in the United States. An average of more than 300 men were employed for over a year in the construction of the factory, and 250 men were employed during its initial years of operation. The factory building was completed and ready to be occupied by late fall in 1906.

The first sugar-beet factory in Kansas was finally opened today. Governor Hock dedicated it with a brief address to several hundred people who gathered from every section of Kansas to celebrate the birth of a new industry which will make western Kansas a garden... This is a day long to be remembered in Garden City and western Kansas, and it is predicted that the sugar-beet industry will in a few years revolutionize business in these parts.⁵

The first beets purchased by the company were grown mostly in Finney and Kearny Counties. More than 80,000 tons were grown in the year 1906 for which the farmers were paid a half-million dollars. More than 150 houses were built for tenants during the first two years of operation. Fences were also erected and surveys were made for the future of the young industry.

The Garden City sugar-beet factory did not find all the steps of becoming a great beet sugar producer simple and easy. The Garden City Sugar and Land Company originally had more than 40,000 acres of land divided into cattle pasture, alfalfa land, and sugar-beet production. The founders of the new sugar industry dreamed of developing the Arkansas Valley stretching far out in the upland prairies of western Kansas. These men dreamed of damming the Arkansas River above Garden City and diverting the water into ditches to irrigate hundreds of acres of beets. They did

⁵ Topeka Daily Capital, November 15, 1906.

dam the river, dug ditches, and built the factory, but the river went dry and a dream seemed wasted. Groups of Colorado capitalists also had the same idea so they took the first chance of the water flowing down from the Rocky Mountains. Years of lawsuits followed between the two states of Colorado and Kansas. Investigations and hearings were held, but the irrigation plants of Colorado kept draining the river, depriving southwestern Kansas farmers of water from the Arkansas River.

There was only one hope left for the Garden City project and that was irrigation by setting up huge reservoirs. Government experts looked at the land and said that the earth was so porous it would not hold water. Much of their opinion was based on earlier results of experiments. Irrigation was the first remedy applied in southwest Kansas to overcome the effects of drouth.

The Garden City Ditch, which was the first to be constructed in western Kansas, was built by Mr. W. H. Armentrout the latter part of 1879...The next year seventeen farmers who lived along the ditch bought it from Landis and Hollings....It remained in the farmers' hands until the Sugar Company came in, or about 1905.⁶

After several years of experimental work, efficient and economical means of pumping water from underground sources seemed to be the best solution to combat drouth years. In 1905, the government undertook to put in a pump irrigation system near Deerfield, Kansas, in order to supply water for the Farmers Ditch. Federal funds amounting to 1½ million dollars were spent in reclamation

⁶ Garden City Daily Telegram, June 8, 1937.

service on this irrigation project west of Garden City. The government took over a ditch that the farmers had been trying to operate as a cooperative enterprise. Wells were put down to operate by the use of electricity. The project called for farmers dependent on the ditch to pay \$3.00 an acre annually for 10 years after which the plant was to be turned over to them.⁷ A series of shallow wells, each with an individual motor and pump, were put across the Arkansas Valley. They succeeded in pumping water into the Farmers Ditch. There was no evident lack of water, but the government could see no future in such an expensive operation. Therefore, the project was abandoned in favor of private interests.

The private interests who succeeded where the government had failed were, of course, the Garden City Sugar and Land Company. The recently organized company bought and leased thousands of acres of land in the surrounding territory for the express purpose of growing sugar-beets. To store the flood-waters of the Arkansas River, the company constructed a vast reservoir, 23 miles west of Garden City, in Kearny County.

From this reservoir, five miles long, and with a storage capacity estimated at 2,352,000,000 cubic feet, or 54,000 acre-feet, it is planned to irrigate 100,000 acres in Kearny and Finney Counties.⁸

The reservoir covered 3000 acres, and was a mile and half wide and 30 feet deep at its greatest depth. The capacity ranged from

⁷ Topeka Daily Capital, September 23, 1906.

⁸ Kansas State Board of Agriculture, Annual Report, 30:124, June, 1914.

11,000,000,000 to 12,000,000,000 gallons of water. The huge reservoir was later named Lake McKinney after one of the sugar-beet industry's greatest backers.

Still the natural reservoir was not enough to make the sugar-beet business pay. The reservoir could be filled only once a year, and when it was drained as needed there was no way of refilling it again. Consequently, the sugar-beet company was forced to put down deep wells.

Fifty wells were put down to an average depth of 400 feet, costing complete, with pump and pipes, between \$8000 and \$10,000 apiece....These wells will pump from 1600 to 2200 gallons a minute.⁹

The water was pumped into a concrete flume that carried it many miles eventually into the huge reservoir. Thus, the Arkansas Valley sugar-beet region was irrigated from the flood waters of the Arkansas River, water pumped from 50 deep wells, and water from a series of shallow wells pumped by electricity.

Many pumping plants were installed in the Arkansas River Valley from Garden City to Syracuse during the latter part of the first decade in the 20th century. Finney County alone had 500 or more plants with a capacity of almost 6500 acres. The Arkansas Valley, four to six miles wide, is bounded by sandy territory on the south and loamy uplands in the north. Farmers living in the Valley had only to go 10 to 15 feet to reach water. This resulted in the erection of a great many shallow wells.¹⁰

⁹ A. B. McDonald, "Sugar on the Kansas Plains," Country Gentleman, 85:10-11, January 24, 1920.

¹⁰ F. D. Coburn, "Irrigation by Pumping in Western Kansas," Report of the Kansas State Board of Agriculture, 30:3, 1912.

As has been previously mentioned, the Garden City United Sugar and Land Company purchased several thousand acres of land on which they built the first and only sugar-beet factory in Kansas. The factory seemed to be the exact stimulus the southwestern part of the state needed.

No single industry has ever brought such substantial and permanent improvement to any country, or put more money into the hands of the farmer, who in turn diverted it into the channels of trade. The coming of the great industry immediately put life into our people, business of all kinds improved and expanded, farms again came into demand, and more and more money appeared in the chamber of trade. In addition to the sugar factory, the company installed an irrigation project as well as a great electrical plant which spread a net-work of light, etc.¹¹

Today, the sugar-beet growing section of western Kansas can be compared favorably with the Arkansas Valley of Colorado, the largest sugar-beet producing state in the country, although Kansas yields are not as high. The splendid water supply has helped to make this an outstanding sugar producing area. Cheap pump irrigation has made modern irrigation economical. Water from the Arkansas River is stored in Lake McKinney, the company's reservoir near Lakin, and is distributed from there to the various beet fields. The river is tapped by five canals between Garden City and the Colorado line. The Great Eastern and the Amazon Ditch, belonging to the Garden City Company, carries water to Lake McKinney. The company also owns a huge booster plant near Deerfield, which raises water from the Arkansas River to upland canals. Although a little too expensive to operate steadily, this plant is

¹¹ Anne B. Arnold, A History of Kansas (Garden City: Garden City Publishing Company, 1915), p. 28.

often used to save the beet crop during years of water shortage. The Garden City Company has invested heavily in irrigation facilities, and a few independent producers have written agreements to use the water in order to produce good beets and other crops.¹²

Following the development of irrigation, the company at Garden City began to plan for the future. The big acreage of the company was cut into farms and leased to farmers who raised crops on shares. The company built hundreds of four-room houses on the farms in its expanding project. A transmission line was soon built like a huge net throughout the area, furnishing power to run the water pumps. A railroad, the Garden City and Western, was built by the company and extends 15 miles through the beet farm area, with numerous loading docks, sidings, and stations. This railroad is a private line owned and operated by the company. The line exists mainly because of the sugar-beet harvest. The railway serves the rural communities of Lowe, Rodkey, Richard, Peterson, and Wolf. For two-thirds of its length the road always is alongside farms owned by the sugar company. A seasonal crew of four handles the tiny railroad, Benson the chief manager and A. J. Reggenbuck the engineer. Nobody gets a bigger thrill when the annual beet harvest begins than these two gentlemen.¹³

It has been stated that the territory between the Colorado line and Wichita, Kansas, in the Arkansas Valley is adaptable to sugar-beet raising. With this possibility, enough sugar-beets

¹² Personal Interview with Mr. J. R. Latta, Agricultural Superintendent of the Garden City Company, November 25, 1948.

¹³ Kansas City Times, November 12, 1938.

might possibly be grown to merit the establishment of another factory similar to the Garden City plant. However, the Garden City factory is one which is utilizing increased farm production of sugar-beets and providing a steady, dependable income for the people in that area. The factory is of necessity a large and complicated establishment. The sugar-beet industry is still a young one when compared with most other crops in the state. At the present time the company is sufficiently large enough to take care of all the beets in the surrounding territory. The fact that it is run efficiently as a huge company is evidence of the faith all the people have had in it through good years and bad. At present the company owns a block of 25,000 acres of its own located west of Garden City. At one time it operated this land as one huge farm, but in 1920 this policy was changed and the land was turned over completely to tenant farmers. The United Sugar and Land Company was officially changed to the Garden City Sugar Company in 1920. In 1930, it became known as the Garden City Company. The reason for this change was because more and more farmers had prospered and bought shares in the company. This has distributed ownership so that the enterprise is somewhat similar to a cooperative concern.

The question of "Why doesn't the sugar company raise its beets itself and not rent out the land?" is a frequent one asked of company officials. The answer always given is the same. The company factory is making sugar not farming. It wants beets of a good quality or it would not furnish help and hire experts to tell the farmers how to tend their beets. The company has learned

that better care is taken of the beets when the farmer has a personal interest in the crop.¹⁴ The growers who farm the company land give a fraction of their crop as rental, and the company purchases all beets on a basis of the market price of sugar at the time of harvest. If the price of sugar advances during the time elapsing between harvesting and marketing, the grower is paid the difference by the company. If the market price declines, the company stands the loss. The integral contract system used, and described in Chapter IV, takes care of most arrangements made before the harvest begins.

The southwest Kansas sugar-beet industry annually grows and processes about 80,000 tons of beets. Without the supply of irrigation water, 10,000 acres of land in the Arkansas Valley area would not be planted to sugar-beets, and there would probably be no sugar-beet factories in Kansas. Southwest Kansas is the only portion of the state which has finally been adapted to the production of sugar-beets. The average annual output of the factory is about 225,000 hundred-pound bags of sugar. Six thousand acres of Finney County irrigated land, a large portion of which is owned by the Garden City Company, is devoted to the production of beets. About 2,000 acres of beets are produced each year in Kearny County and the remainder of the 10,000 acres planted annually lies in Ford, Hamilton, Pawnee, and other counties along the Arkansas River.

Over the past years this company has produced approximately 200,000 bags of sugar each year; that is,

¹⁴ Kansas City Star, September 23, 1906.

100-pound bags. This, of course, varies different years depending upon the type of season, the availability of irrigation water, and the price paid for sugar-beets. In 1947 our average yield was 11.6 tons per acre and in 1948 the average yield was 9.87 tons per acre. 1948 was a difficult year for sugar-beet growers because, during the month of April, we had no precipitation at Garden City. This lack of moisture made planting difficult because the beets had to be irrigated for germination.¹⁵

The sugar-beet industry annually brings about \$1,000,000 to southwest Kansas. This amount is distributed in the form of payments to beet growers, wages for field and factory workers, and payments for supplies and equipment. During the fall and winter when the beets are processed into sugar about 350 men are employed in the factory and at receiving stations. During the growing season hundreds of people are employed in the fields.

Over all the business of company holdings, irrigation, factory, railway, and offices is a general manager, Mr. W. E. Leavitt, who lives in Garden City where all of the offices of the company are located. Mr. John R. Latta is the present Agricultural Superintendent for the company, and Mr. J. Edwards is in charge of the general office work. There are other numerous personnel who make the organization a smooth-running one. There are several districts made up of specific acreage with a field supervisor in charge of each district. The company officials usually decide that during the coming year there shall be a specified number of acres of beets and other crops planted. The crop plan is laid before the field supervisors, and they are told how much there is to be done. The field supervisor rides his district every day.

¹⁵ Personal letter from Mr. J. R. Latta, February 8, 1949.

Table 1. The 1946 Kansas sugar-beet crop*.

County	Acres harvested	Yield per acre	Production tons	Farm value
Ness	40	9.5	380	\$ 3,950
Scott	890	13.5	11,860	123,330
West Central District	930	13.3	12,240	127,280
Finney	3,770	9.3	35,060	364,620
Ford	260	12.0	3,120	32,450
Grant	280	11.6	3,280	33,800
Gray	110	15.3	1,680	17,470
Hamilton	710	10.7	7,600	79,040
Hodgeman	60	9.5	570	5,930
Kearny	580	10.4	6,050	62,710
Southwest District	5,770	9.9	57,310	596,020
Rush	--	--	--	--
Central District	--	--	--	--
Pawnee	310	12.1	3,750	39,000
South Cen- tral District	310	12.1	3,750	39,000
State	7,000	10.5	73,300	\$762,300

*Source: 35th Biennial Report of the Kansas State Board of Agriculture, Topeka, 1946, p. 419.

He knows what is going on and serves as a contact man between laborers, farmers, and the company. The Garden City Company has been very fortunate in having men who know beets as well as being capable of fostering good relations among all concerned.¹⁶

The sugar plant is operated only about three months of the year. Preparations are made late in the summer to start the plant with the actual commencing of making sugar about 10 days after the harvest begins on or around October first. Operations continue until all the beets grown in the area are harvested and the sugar is refined.

The beets are hauled in trucks to high platforms alongside the railway. There the beets are dumped into the railroad cars. These open freight cars are hauled to the sugar factory where the car bottoms are opened. The beets fall into vats and float to the mill. At the factory, the process the sugar-beets follow is the same as that noted on Plate II. The beets are washed clean and sharp knives slash them into shreds. They are then boiled, and the sweet syrup is boiled still more until the sugar crystallizes. The sugar is then purified, bleached, dried, granulated, and sacked--all of which is done by automatic machinery. The beet pulp, after the sugar is taken out, is dried and sold for stock feed. The dried beet pulp almost always leaves this area. Most of it is shipped to southern states where it is used for dairy cattle feed. Little of the pulp is kept here because of the abundance of alfalfa in the area. Virtually all of the sugar produced

¹⁶ Personal Interview, J. R. Latta, November 25, 1948.

EXPLANATION OF PLATE I

Fig. 1. A "crop master" type of mechanical blocker in use on the Vern Mayo and G. B. Mayo farm located just east of Garden City, Kansas.

Fig. 2. The same "crop master" in operation on the Mayo Brothers farm. Vern Mayo is a representative for his sugar-beet district, and G. B. Mayo carries on the farming operations.

Fig. 3. This photo shows the re-loading of piled beets from the ground onto the railway cars in the fall of 1947.

Fig. 1



Fig. 2



Fig. 3



EXPLANATION OF PLATE II

- Fig. 1. "A Story of Sugar" was taken from a folder type copy found in the publication "The Silver Wedge." The same actual process for manufacturing sugar is followed at the Garden City Company.

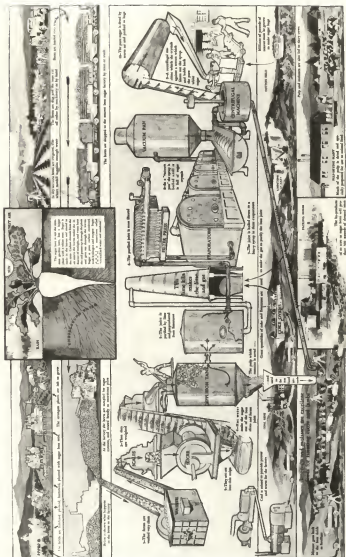


Fig. 1

by the Garden City Company is sold in Kansas, for there is sufficient market for the factory's production here in the States.

CHAPTER IV

SOME FEATURES OF SUGAR-BEET PRODUCTION

Every year from one to two million men, women, and children move about the country seeking farm jobs. Most of these people follow the crops and harvests from one section to another, finally, returning to their homes. This migration of workers is nothing new in the United States. The peak requirements of crops with heavy labor demand have drawn field hands from all over the nation for a great many years. Usually, these migrant workers move on or return to their homes after finishing a harvest. Many fruit, vegetable, sugar-beet, and other irrigated crops have encouraged heavy migration to the sections of the country where such crops are grown.

Outside labor has been very important in the sugar-beet fields since the turn of the twentieth century when the tariff gave stimulus to increased production and acreage. Unlike most migratory laborers, beet workers move only twice a year. They move in the spring to the farms where they contract to bunch, thin, hoe, and top the crop. They then move again to winter quarters or to seasonal work elsewhere. Oftentimes, the beet workers are permitted or request to remain through the winter on the same place they live during the summer season. This is not the usual case, however, as most of them prefer to move elsewhere.

Many peoples have mingled in the sugar-beet fields. German-Russians, Mexicans, Spanish-Americans from New Mexico, Japanese

and Chinese have been found in the areas where beets are grown. In the mid-western states of Wisconsin, Nebraska, Kansas, Iowa, Michigan, and Minnesota, Belgians, Poles, and Mexicans are the most prevalent in performing beet labor. The State of Kansas has predominantly employed the Mexican people to work in the beet harvest fields. Only in rare instances, such as World War II when a few Japanese were used, have other races been employed. The local Mexican labor supply during normal times has been plentiful enough to work the harvest. However, not always has the local labor, combined with migrant labor, been sufficient to do the job well. As a result, steps are taken each year to insure a good supply of labor for the sugar-beet farmers in the Arkansas Valley area.

The amount of outside labor needed depends upon the size of the local labor supply. Since there are always some extra workers to be found at home, outside workers are needed primarily to meet exceptional circumstances. An increase of 10 per cent in crop acreage may increase the number of immigrants by one-half, while a similar decrease in acreage can easily diminish the number in the opposite direction.¹ The always present rumor, "via grape-vine," of a reported beet crop failure has more than once left a beet region with insufficient help until more labor could be supplied.

Sugar-beet production is an industrial form of agriculture in which the sugar factories are influential throughout the pro-

¹ Paul S. Taylor, "Adrift on the Land," Public Affairs Pamphlet No. 42, p. 4, 1940.

case, from finance to seed and hand-labor. These sugar factories, like the Garden City Company in Garden City, Kansas, often have to seek field labor at different points. In recent years, labor agents have recruited laborers from the southwest states of Texas, Arizona, and New Mexico for the sugar-beet field in Kansas and Nebraska. There have been times when this labor market has extended into central Mexico, and the cotton and beet growers have used every influence in their power to obtain Congressional approval to bring Mexican workers from Mexico each season. During the time of World War II, Congressional action approved the hiring of Mexican Nationals to do farm labor in the agricultural sections of the United States. About 265 Mexican Nationals were used in Kansas in 1945.² The following year 432 were imported from Mexico. The Garden City company used approximately 300 of these workers in sugar-beet field work.³

It is the customary thing for the various sugar producing companies to have a labor representative who is charged with the recruitment and transportation of these workers.⁴ It is extremely important that these laborers get to their work as quickly as possible because much of the hand-labor must be performed on a definite schedule. The labor representative must of necessity be a good man who can handle men well.

² Frank Blecha, et al, Farm Labor Report, Kansas State Agricultural College Experiment Station Project No. 32, December, 1944, to March, 1945, p. 10.

³ Blecha, Op. Cit., December, 1946, to November, 1947, p. 10.

⁴ Ibid., p. 11.

The growing of sugar-beets requires approximately 93 hours of man-labor per acre. Opportunities for employment attract many people to the beet-growing areas of the middle-west states. Like those who group themselves around any other industry, these people vary a great deal in their capacity to accomplish useful work. However, as a rule those who are employed in the beet fields have come as family groups. The handwork of thinning, hoeing, weeding, and topping required in cultivating and harvesting a beet crop has been performed by family groups for a long time by contract. The beet contract is a family undertaking in the same sense that operating a farm within the sugar-beet area is a family enterprise. Thus, it is for this reason that it is logical to consider all the income of the sugar-beet laborer on a whole family basis.

The use of seasonal contracts for the hiring of the hand-labor is a distinctive feature of the sugar-beet industry. This labor contract is usually made between the beet grower and the worker after the grower has already made a contract with the factory for the raising and selling of the crop.⁵ The employment status of the beet worker is thus governed by the triangular relationship of laborer, grower, and the sugar company. The labor contract itself specifies the acreage on which the handwork is to be done, the manner prescribed, housing situation, and the rate of wages per acre. It also provides the conditions of store credit guarantee, and specifies the time of payment for the work performed. A clause often is left open whereby the grower has the

⁵ E. S. Johnson, "Wages, Employment Conditions, and Welfare of Sugar-Beet Hand Laborers," Monthly Labor Review, 146:323, February, 1938.

right to hire extra help in case it is needed. The sugar company generally handles the payments to the laborers through the field manager, or else the company has offices for this purpose.

The sugar company, rather than the grower, always recruits beet-workers to be hired by the growers and finances the cost of transportation in some instances. In case of dispute between the contracting laborer and the grower, the sugar company's field agent assumes the role of arbiter. The main advantage of the labor-contract system is the assurance of a plentiful supply of hand-labor for the sugar-beet farmer who must be assured of adequate help during the growing and harvesting of the crop.

The growing of sugar-beets is a specialized type of agricultural production that requires great skill of the laborer. Some of these families have been handed down this skill from generation to generation. Others come into the areas, like the Arkansas Valley, without any previous skill whatsoever, to learn the handwork of sugar-beet care. Wages for this handwork in the beet fields are paid on a piece-work basis. Thinning, hoeing, and weeding are done by the acre, and topping is done by the ton. The number of acres that a family can do is important in determining the total income. Much depends, therefore, on the quality and the quantity of the work plus whatever other jobs the different members of the family can do, such as irrigating and harvesting other crops. The handwork required in cultivating and harvesting a crop of sugar-beet is seasonal. As a general rule, an industrious family attempts to contract about 10 acres for each adult worker.

There has never been a well-defined standard of fitness for families employed in the beet fields. Some of the qualifications would probably be: the family should be able to work at least 25 or more acres; each worker should do a specified minimum amount of work of standard quality; and each adult male worker should be able to do other than beet-field labor, such as running a tractor or shocking grain. There are a few farmers in some areas who require the above qualifications, but the practice of securing prior proof of ability and skill before working is not the common rule. At this point the agricultural supervisor of the sugar factory and his assistants are the ones who, along with the farmers, inspect the work of the laborers.

Generally speaking, the beet growing and harvesting season cover a period of 150 to 180 days. In Kansas, about 50 to 65 days of this period is taken up by actual handwork on the crop. The actual thinning and topping, under normal conditions, averages approximately three weeks. Normal conditions are not always prevalent which often causes the topping season to be extended because of extreme cold. Excessive rainfall has also delayed many beet crops from getting the proper thinning and weeding at the normal time in the early summer. Farmers in the Arkansas Valley sugar-beet area also plant other crops requiring cultivation, irrigation, and harvest which often runs parallel to the care of the sugar-beet crop. The time factor is indeed a very influential factor in the sugar-beet industry in Kansas areas where beets are grown. There is still some time left during the year when there is no employment available to all members of the beet

workers' families. It is at this time that many workers begin to move to nearby towns for the winter while others move on.

The conditions under which the sugar-beet migrants live and work are oftentimes very difficult. These people who are migratory workers do not own or rent permanent homes like some of the local workers who have lived in the community for years. The migratory beet workers often travel great distances to work. They have to face low-earnings, unemployment, instability and insecurity, bad housing, interrupted schooling for their children, and prejudice and hostility from the already-established residents. The life of the sugar-beet migrant is a hard one. Many times jobs are scarce and also hard to find. Drouth plus a poor year add many woes to the farmer and worker alike. The seasonal beet laborers have to migrate from place to place to look for work. This moving around costs money, and the overhead expense eats up any savings quickly. Worse still, the continued moving about has its telling effects on the young children who are called upon to do their share of work. School officials in the towns and cities to which these people go usually experience difficulty in arranging the school calendar for these children. This problem is one of the major worries of school officials and workers alike.

Nation-wide unemployment in the early 1930's drove many families to handwork on beet farms in the mid-west. Hundreds of Mexicans migrated to the Arkansas Valley region around Garden City, Kansas. Sugar-beets, like other Kansas crops, were hard hit by drouth and grasshoppers, but there were still many acres to be harvested. The number of workers did not affect the farmers or

the factory as far as wages were concerned. In other words, the method of paying wages did not restrict the number of workers. The reason lies in the fact that beet-work is paid on a piece-work wage. The grower's costs are the same whether the work is done by a family that is well qualified or by one that accomplished little work during the season. In case the family can not complete the job as promptly as required, extra workers are hired to avoid yield-reducing delays. This writer has been witness many times to seeing dozens of workers in a large 120-acre field all working side by side. Most noticeable of all were the dozens of little youngsters working right alongside older brothers and sisters. How the official surveyors ever determined exactly how much each family did, and the family in turn decide how much each member did, has always remained a mystery to the author!

During the early days of the depression in the 1930's the conditions of the beet laborers were characterized by low incomes and dependence upon relief. However, this condition was true everywhere, particularly in the agricultural states of the nation. Immediate legislation was passed by the New Deal Administration under the guidance of President Roosevelt. As approved by the President on May 12, 1933, the Agricultural Adjustment Act contained relief provisions for the farmer, but not directly for the farm laborer. However, the Jones-Costigan Act, signed on May 9, 1934, added sugar-beets and sugar cane to the list of basic agricultural commodities. Thus, the Secretary of Agriculture was authorized to insert into the Act provisions which would

limit or regulate child labor, and thereby make possible the setting up of minimum wages.

In accordance with terms of the Jones-Costigan Sugar Act, the following provisions in general were inserted in the Sugar Beet Production Adjustment Act: child labor, fixing of minimum wages, and the adjudication of labor disputes.⁶

The existence of child laborers in the beet fields to an extent that was socially harmful had long been asserted by such agencies as the Children's Bureau and the National Child Labor Committee. The Tariff Commission estimated that in 1933, 9541 boys and 5892 girls under 16 years of age, members of contract laborer's families, worked in the beet fields of the U. S. The Children's Bureau declared that the work required was "probably the most exacting done by children anywhere, because of long hours, strained positions, intense heat, exposure to wet, and the speed required in certain operations."

The Jones-Costigan Act gave the Secretary of Agriculture the right to regulate the age of the laborers through benefit-contracts or other forms of agreement between the growers and the Secretary. The provisions of these contracts prevented the growers from employing children under 14 years of age in the production of sugar-beets. Children of 14 and 15 years of age could be employed, but their labor had to be limited to eight hours a day. However, the restrictions did not apply to members of the grower's immediate family which brought about complaint from the laborers.

The administration of the child labor clause of the production adjustment contracts was a fairly simple matter. As a whole, the producers, growers, and laborers cooperated, although there

⁶ W. T. Ham, "Sugar Beet Field Labor Under AAA," Journal Farm Economics, 19:643, May, 1937.

were some complaints about the application of the clause. The biggest objection seemed to come from the laborers who complained of their reduced family earnings. Minimum wages with respect to sugar-beet labor were fixed by geographical districts after hearings had been held by the representatives of the Secretary of Agriculture. These hearings were usually of a general nature without any scientific approach to the wage scale, but the general average usually came out within reason from one area to another. The Department of Labor, in preliminary investigations by the Children's Bureau into the family welfare of the beet worker, also reported favorable progress in six representative beet-growing states.

The effects of the child labor provision varied greatly in the different areas visited. The work of children under 14 years of age was practically eliminated in 1935 in four of the eleven areas visited... The marked success in enlisting the cooperation of producers and laborers found in most of the areas visited was due directly to the interest and energy of the representatives of the AAA and the sugar companies.⁷

According to the United States Farm Census of 1935, nine counties in the west-central part of Kansas grew sugar-beets for commercial purposes. Finney County with 6288 acres and 3687 tons was the largest producer. Edwards County with 120 acres and 814 tons was the smallest yielder. The total production in 1934 was 59,873 tons; in 1929 it had been 50,771 tons.

The value of the 1934 crop was \$278,409 and that of 1929 was \$335,397, but in 1934 Kansas sugar beet

⁷ Ibid., p. 645.

growers received \$205,300 in benefit payments under the AAA, making the total income of sugar growers \$438,709. In 1935 benefit payments totaled \$75,300. The invalidation of the Agricultural Adjustment Act in January, 1936, cut off benefit payments.⁸

The Sugar Act of 1937 was passed to protect the farmer, but he had to do certain things in order to qualify for future benefit payments provided for under the Act. The Secretary of Agriculture was required to determine, for each calendar year, the amount of sugar needed to meet the consumer needs in the United States. Therefore, he established quotas for domestic sugar-producing areas.⁹ Kansas beet growers would then be paid on the amount of sugar actually needed for consumption in proportion to the yield per acre basis. Payments were also to be made in case of damage to the crop from wind, hail, and insects.

Thus, the Sugar Act of 1937, enacted after the Supreme Court invalidated certain provisions of the Jones-Costigan Act, provided for a sugar-quota program, a processing tax on sugar, and for conditional payments to growers of sugar-beets.¹⁰ The Act further provided that the farmers must (1) carry out certain farming practices specified by the Secretary of Agriculture, (2) pay laborers wages determined fair by the Secretary of Agriculture, and (3) permit no children under the age of 14 to be employed.¹¹ This was the last and most recent Congressional legislation passed to protect the sugar-beet grower and the beet worker, particularly

⁸ J. D. LeCron, "Federal Sugar Act of 1937," Kansas Yearbook, 1939, p. 210.

⁹ Loc. Cit.

¹⁰ Johnson, Op. Cit., p. 323.

¹¹ LeCron, Op. Cit., p. 210.

the best-worker's children.

The actual thinning of sugar-beets by hand or with the aid of a hoe is a tedious and back-breaking job. For a number of years agricultural engineers have been working on the design of machinery and the perfecting of methods to operate machines to do this labor mechanically. Because of the shortage of manpower for farm work during World War II, the experiments with machinery progressed rapidly. It was found that most of the hand-labor could be eliminated through mechanical blocking and thinning. The man-labor required for blocking and thinning usually ranges from 12 to 20 man-hours per acre. Experiments have shown savings of from 65 to more than 95 per cent of the man-labor of thinning sugar-beets when machines were used. The United States Bureau of Plant Industry found labor savings of from 30 to 40 per cent over a two-year period of mechanical as compared with hand-blocking and thinning experiments conducted over the western half of the United States.¹²

Mechanical harvesting is still largely in the experimental stage. However, it is not too much to expect that within a few years, machines will be developed that will provide even further savings in time and expense in the production of sugar-beets. The sugar-beet harvest will in all probability remain a hand operation until mechanical pickers are made available on a commercial basis. The mobile labor workers will, of course, face dis-

¹² S. W. McBirney, "Sugar-Beet Blocking by Machinery," United States Department of Agriculture Bulletin 1933, April, 1933, p. 1.

placement from the best jobs they have held in the past. This will not really be a big shock to them because mechanization has been tried and proved for several years in the sugar-beet areas. For example, in 1946 the Garden City Company topped five per cent of the beet crop by use of machines, 25 per cent in 1947, and 56 per cent in 1948.¹³ Strangely enough, the Garden City Company was forced to try these new methods because of the shortage of labor. There were not enough workers to do the necessary jobs.

The 1940's were marked by war, with a farm labor shortage prevalent everywhere. Many of the laborers ordinarily used had jobs elsewhere in other industries. The war ended, but many beet workers were reluctant to go back to the difficult job of thinning and topping beets. As a result, sugar-beet producers had to use the new machines or lose the crops.

Nevertheless, there are still many hundreds of beet workers who come annually to the sugar-beet fields of the Arkansas Valley in southwest Kansas. There have been many incentives for them to continue to do so. Outside of the necessity of earning a living, these workers have found that the conditions have changed such as in living quarters and transportation. It is now a common practice for the owner of the beets to provide a good house and land for gardens for the worker's family. These tenant homes have been modernized in many instances under the supervision of the Garden City Company. Some beet-labor families have even acquired proper-

¹³ J. R. Latta, Personal Letter, February 8, 1949.

ty and land for themselves. Ownership of trucks, automobiles, and radios has encouraged better work and a better feeling of understanding among all concerned in the sugar-beet industry. Better roads and quicker methods of transportation are among the highlights of a new era under the directorship of the company at Garden City.¹⁴

There are other factors influential in making the life of the sugar-beet laborer a happier one. The activities of the American Legion, Veterans of Foreign Wars, and several well-meaning civic organizations have done much to foster a more ideal life for these beet laborers. Sugar-beet production has indeed proved to be the most dependable and largest source of cash income for farmers in the southwestern part of the State of Kansas. Many farmers and farm laborers look to the beet crop to carry a substantial part of the taxes, interest on borrowed money, and general welfare for a wholesome life. It is the one crop that contributes to a complete agricultural program enabling farmers to make the best use of their surrounding land. The sugar-beet industry offers continuous employment to farmer, factory, and laborer alike with a more stable income than any other agricultural industry in western Kansas.

¹⁴ J. R. Latta, Personal Interview, November 25, 1948.

ACKNOWLEDGMENT

The writer wishes to express his sincere thanks and give special acknowledgment to Dr. Verne S. Sweedlun, who assisted and supervised the guidance of the research organization. Sincere thanks are also expressed to Miss Lorene Anderson of the State Historical Library; Mr. John R. Latta, Agricultural Superintendent of the Garden City Company; and many others who helped find research material in preparation for this study.

BIBLIOGRAPHY

Government Publications

- Blecha, Frank, et al. Farm Labor Report. Kansas State Agricultural College Experiment Station Project No. 32. Manhattan: Extension Service Publication, 1945, 1946, and 1947.
- Block, Mrs. Henry. Story of Their First Three Years of Experimental Production in Kansas for Commercial Sugar-Making. 14th Biennial Report of the State Board of Agriculture. Topeka: State Board of Agriculture, June, 1906.
- Coburn, F. D. Irrigation by Pumping in Western Kansas. Report of the Kansas State Board of Agriculture. Topeka: State Board of Agriculture, June, 1912.
- Failor, G. H., and J. T. Willard. Experiments with Sugar Beets. Kansas State Board of Agriculture Experiment Station Bulletin 16. Topeka: State Board of Agriculture, December, 1890.
- Failor, G. H., and J. T. Willard. Experiments with Sugar Beets. Kansas State Board of Agriculture Experiment Station Bulletin 36. Topeka: State Board of Agriculture, December, 1892.
- Failor, G. H., and J. T. Willard. Experiments with Sugar Beets. Kansas State Board of Agriculture Experiment Station Bulletin 43. Topeka: State Board of Agriculture, December, 1893.
- Harrison, Geo. B. The Beet-Sugar Industry in Kansas. 15th Biennial Report of the State Board of Agriculture. Topeka: State Board of Agriculture, 1907.
- Johnson, E. S. Wages, Employment Conditions, and Welfare of Sugar-Beet Hand Laborers. U. S. Bureau of Labor. Washington: Government Printing Office, February, 1938.
- Kellog, Geo. F. The Sugar Industry of Kansas. 7th Biennial Report of the State Board of Agriculture. Topeka: State Board of Agriculture, January 15, 1891.
- McBirney, S. W. Sugar-Beet Blocking by Machinery. U. S. Department of Agriculture Bulletin 1903. Washington: Government Printing Office, April, 1933.
- Manhouse, L. A., and T. H. Sumner. Saving Man Labor in Sugar-Beet Fields. U. S. Department of Agriculture Bulletin 1042. Washington: Government Printing Office, January 14, 1928.
- Miller, Frank K. Income Levels of Contract Beet Workers in Nebraska. Department of Rural Economics Bulletin 335. Washington: Government Printing Office, November 1, 1941.

- Mohler, J. C. Sugar Beets. 35th Biennial Report of the State Board of Agriculture. Topeka: State Board of Agriculture, 1946.
- Sharer, E. C. The Sugar-Beet Industry in Kansas. 16th Biennial Report of the State Board of Agriculture. Topeka: State Board of Agriculture, June, 1909.
- Skuderna, A. U. Important Sugar-Beet By-Products and Their Utilization. United States Department of Agriculture Bulletin 1718. Washington: Government Printing Office, January, 1934.
- Slichter, C. S. Garden City Project. House Document No. 86, 59th Congress, 1st Session. Washington: Government Printing Office, 1901.
- Statutes of the United States of America. "Sugar Bounty." First Session of the Fifty-First Congress. Washington: Government Printing Office, 1890.
- Tolman, Bion, and Albert Murphy. Sugar Beet Culture. U. S. Department of Agriculture Bulletin 1903. Washington: Government Printing Office, May, 1942.
- Tucker, R. H., and T. J. C. Stewart. Sugar-Beet Growing in Colorado. Colorado State College Extension Bulletin 363-A. Fort Collins: Colorado State College Service, January, 1941.
- U. S. Department of Agriculture. Special Report on the Beet-Sugar Industry in the United States. Washington: Government Printing Office, June, 1898.
- U. S. Department of Agriculture. Special Report on the Beet-Sugar Industry in the United States. Washington: Government Printing Office, April, 1899.
- Wagner, F. A. Sugar Beet Industry in Western Kansas. Kansas Year-book. Topeka: State Printing Office, 1937.
- Willard, J. T. Sugar Beets. 11th Annual Report of the Kansas State Agricultural College, Experiment Station Bulletin 79. Topeka: State Board of Agriculture, April, 1898.
- Willard, J. T., and J. W. Clothier. Sugar Beets. 12th Annual Report of the Kansas State Agricultural College Experiment Station Bulletin 83. Topeka: State Board of Agriculture, April, 1899.
- Willard, J. T., and J. W. Clothier. Sugar Beets. 14th Annual Report of the Kansas State Agricultural College Experiment Station Bulletin 103. Topeka: State Board of Agriculture, June, 1901.

Periodicals

- "Area under Sugar Beets in 1936." International Review of Agriculture, 27:260s.2s, April, 1936.
- "Beet Sugar Picks Up." Business Week, 122:58, July 21, 1945.
- Blanchard, Leola Howard. "The Garden City Sugar Company." The Conquest of Southwest Kansas, p. 328-331, June, 1931.
- Brown, S. A. "Children Working in the Sugar Beet Fields of Certain Districts of the South Platte Valley, Colorado." A publication of the National Child Labor Committee, October, 1925.
- Clapper, E. H., and T. W. Hine. "Child Labor in the Sugar-Beet Fields of Colorado." National Child Labor Committee Pamphlet 259, April, 1916.
- Ferril, T. H. "Western Half-Acre." Harpers, 194:360-3, April, 1947.
- Floyd, Edith. "Kansas Its Potential Beet Center." Kansas Business, 2:5-6, August, 1934.
- "Garden City Sugar-Beet Factory, Only Industry of its Kind in the State." Official Publication of the Kansas Chamber of Commerce, January, 1937.
- "Government Acts in Beet Labor Shortage." Sugar, 37:15-16, November, 1942.
- Han, William T. "Sugar Beet Field Labor Under AAA." Journal of Farm Economics, 19:643-67, May 7, 1937.
- Kell, E. F. "Garden City--Irrigation Capitol of Kansas." Wichita Magazine, 6:8-9, May, 1929.
- McDonald, A. B. "Sugar On the Kansas Plains." The Country Gentleman, 85:10-57, January 24, 1920.
- Maddox, C. V. "Mexican Beet Labor in Colorado." Producer, 9:3-5, February, 1928.
- Paxon, R. H. "Pumping the Valley of Content." The Earth, 9:7, March, 1912.
- "Resume of Sixteen Years of Research in Sugar-Beet Mechanization." Agriculture Engineer, 29:530-2, December, 1948.

Rollins, William J. "Sugar." Sugar Research Foundation, Inc., 1948.

Smith, P. B. "Harvesting Sugar Beets Mechanically." Sugar, 41:33-5, April, 1946.

Taylor, Paul S. "Adrift on the Land." Public Affairs Pamphlet No. 42, 1940.

"The Sugar Beet in the United States." The Silver Wedge, U. S. Beet Sugar Association, Washington, D. C., 1936.

"Two Hundred Years of Beet Sugar." Sugar, 42:21-2, December, 1946.

Urrachel, W. E. "Sugar Beet Combine." Agriculture Engineer, 27:551, December, 1946.

Newspapers

"Irrigation in the Arkansas Valley." Topeka Daily Capital. September 25, 1906.

"Sugar in Kansas." Topeka Daily Capital. September 2, 1923.

"Sugar in Western Kansas." Kansas City Star. September 23, 1906.

"The Garden City Factory." Topeka Daily Capital. November 15, 1906.

"The Garden City Western Railway." Kansas City Times. November 12, 1938.

"The Only Processing Plant in Kansas Center of Million-Dollar-A-Year Industry." Garden City Daily Telegram. June 8, 1937.

Books

Arnold, Anna E. A History of Kansas. Garden City: Garden City Publishing Co., 1915.

Blakey, Roy C. The United States Beet-Sugar Industry and the Tariff. New York: Columbia University Press, 1912.

Blackman, Frank W., Editor, Kansas History Encyclopedia. Chicago: Standard Publishing Co., 1912.

Dowling, Reginald Norman. Sugar Beet from Field to Factory.
London: E. Benn Limited, 1925.

Harris, Franklin Stewart. The Sugar Beet in America. New York:
Macmillan Co., 1919.

Robertson, Charles John. World Production and Consumption. Lon-
don: J. Bole Sons and Danielson, 1934.

Ware, T. S. Sugar Beet. Philadelphia: Philadelphia Co., 1914.

Personal Contacts

Mr. John R. Latta, Agricultural Superintendent, Garden City Com-
pany, Garden City, Kansas, November 25, 1949.

Mr. John R. Latta, personal letter dated February 8, 1949.

Mr. R. T. Tutt, Vice-President, Garden City Company, Garden City,
Kansas, personal letter dated January 20, 1949.