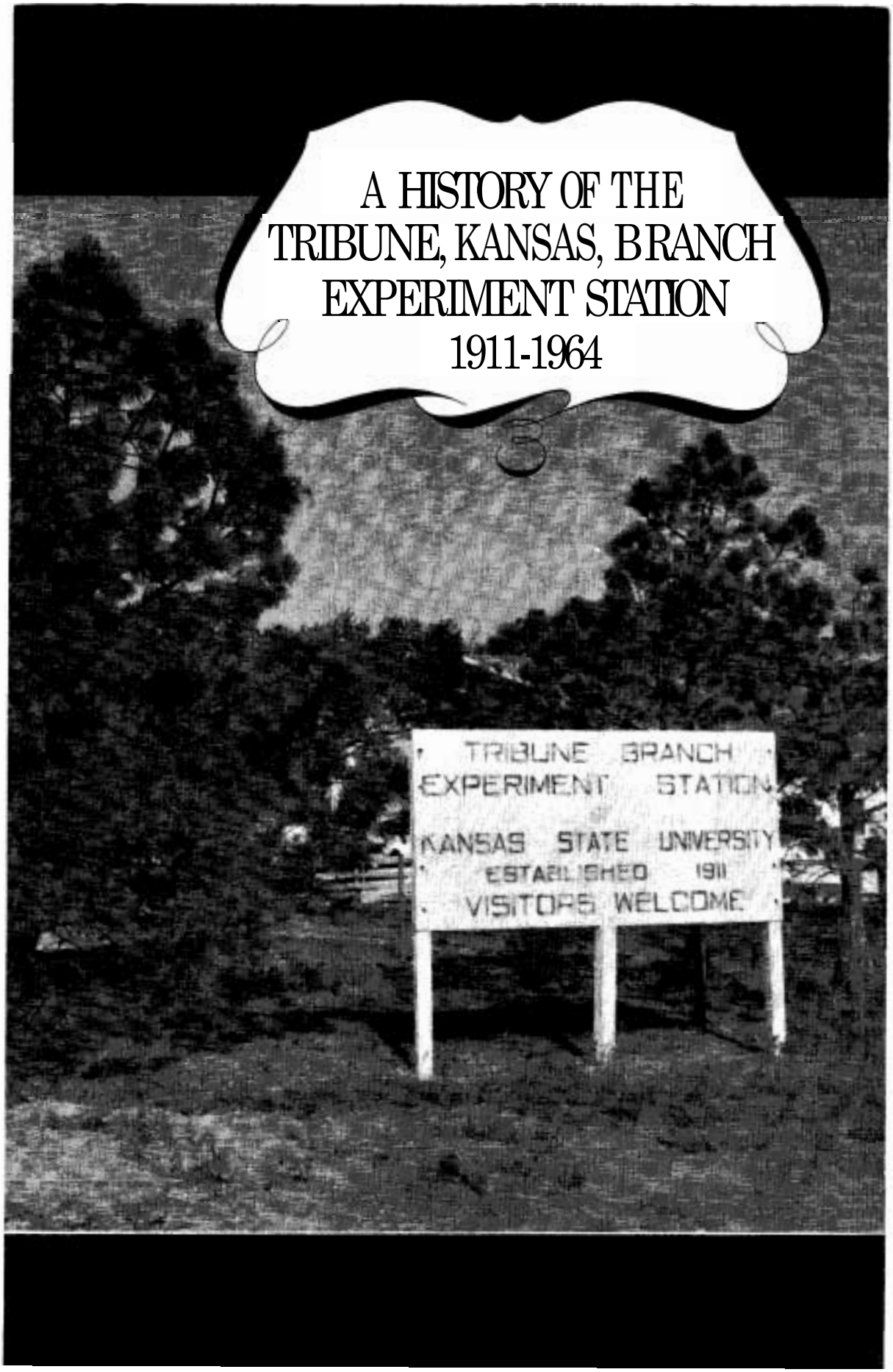
A HISTORY OF THE TRIBUNE, KANSAS, BRANCH EXPERIMENT STATION 1911-1964



ACKNOWLEDGMENTS

The author is indebted to T.B. Stinson, who has served as Superintendent of the Tribune Branch Experiment Station since 1924, for information used in the preparation of this report; to Robert A. Bohannon, Assistant to the Dean, for many pictures taken in recent years at the Station, and to George L. Reid, Jr., of Washington D.C., for the picture of his father.

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A History of the Tribune (Kansas) Branch Experiment Station[1] 1911-1964

by

Leland E. Call[2]

The Tribune Branch Experiment Station was established in 1911. It was started primarily to study the problem of providing feed as a supplement to grass for winter grazing of livestock. When the Station was established, the Tribune region was devoted almost exclusively to grazing. The principal vegetation was buffalo and grama grasses. While the quality of the grass was good, its carrying capacity was low, being not more than one head to 15 acres during the summer and much less when grass was utilized both summer and winter. The best grass was usually produced during late spring and early summer. Only a few animals could be maintained when native grass was the only feed available.

The importance of growing supplementary feed, especially for winter use, was recognized. The best kind of feed to grow and how best to grow it was the question. Need for such information was chiefly responsible for establishing the Station as a demonstration and experimental farm.

The matter was brought to the attention of the College in December, 1910, when W. M. Glenn, Tribune, Senator, Kansas District No. 38, and Clemont L. Wilson, Tribune, Representative, Kansas District No. 112, by a letter from Mr. Wilson to the Board of Regents. Reference is made to the letter in minutes of the Board of Regents, December 20, 1910, as follows: "A communication from Honorable Clemont L. Wilson of Tribune, Kansas, concerning the attitude of the Board toward establishing a demonstration and experimental farm in Greeley County was read and it was ordered that the President of the College write Mr. Wilson and Senator Glenn to come to Manhattan for a conference on the matter."[3]

There is no record of further conferences between the College and the legislators from Greeley County. However, when the 1911 legislature convened, Senator Glenn and Mr. Wilson succeeded in securing the passage of Senate Bill No. 248 authorizing an exchange of land between the state and Greeley County to provide a location for an ex-

1. Contribution No. 112, Office of the Dean, Agricultural Research, Teaching, and Extension, and Director, Agricultural Experiment Station, Manhattan.

2. Dean of the College of Agriculture Emeritus and Director of the Agricultural Experiment Station Emeritus.

3. Minutes of the Board of Regents, KSAC, December 20, 1910, Book C, p. 207.

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periment station. This exchange was not consummated, since another tract of land more satisfactory for the purpose became available through an offer by George L. Reid, a lawyer and public - spirited citizen at Tribune, who desired to have the Station established under the most favorable conditions. Mr. Reid offered to make available to the state, without cost, a tract of land for the Station located midway between Tribune and Horace. Mr. Reid's offer and the action of the Board of Regents in accepting it was recorded in the minutes of the Board, April 7, 1911, as follows:

"A report on the matter of a demonstration and experimental farm in Greeley County was presented by Regent Sherman together with the following communication from Mr. G. L. Reid and on motion by Regent Taylor it was ordered that the same be approved and a demonstration and experimental farm be established."

(Copy of Mr. Reid's Letter)

April 3, 1911

To the Board of Regents of Kansas State Agricultural College, Manhattan, Kansas.

Gentlemen:

I hereby offer to convey to the State all that part of the SE Quarter of Section 19, in Township 18, South of Range 40, west of the sixth Principal Meridian in Greeley County, Kansas, lying south of the right of way of the Missouri Pacific Railroad to be used by the State as an experimental and demonstration farm, said land to revert to myself or my heirs in case it shall cease to be used as above. It is understood that the tract contains upward of one hundred acres, about sixty acres of which is now in cultivation, and the conveyance will include all of the fence belonging to me now on the tract, being the fence on the south and west sides.

Respectively submitted,

(Signed) 'Geo. L. Reid'

Fig. 1.—The Station Farmstead as it appeared in 1914. The house cost $1800. The well and windmill were gifts of the County Commissioners of Greeley County.

The following action was taken:

"Whereas, the legislature made an appropriation for experimental work in western Kansas (Author's note), and the committee of the Board of Regents upon visiting Tribune, Greeley County, Kansas, expressing a desire for a more desirable body of Farm Land best suited for the work, was offered a free gift for this purpose of over 100 acres of land, already fenced, by Geo. L. Reid and the County Commissioners of Greeley County, by resolution, proposed to donate a well with windmill and equipment. Be it therefore resolved, that the Board of Regents of Kansas State Agricultural College extend to Mr. Reid their thanks and high appreciation of his gift and the action of the County Commissioners of Greeley County, and be it further resolved that the Secretary of the Board of Regents advise Mr. Reid and the County Commissioners of the acceptance by the Board and as soon as funds are available work will begin."[4]

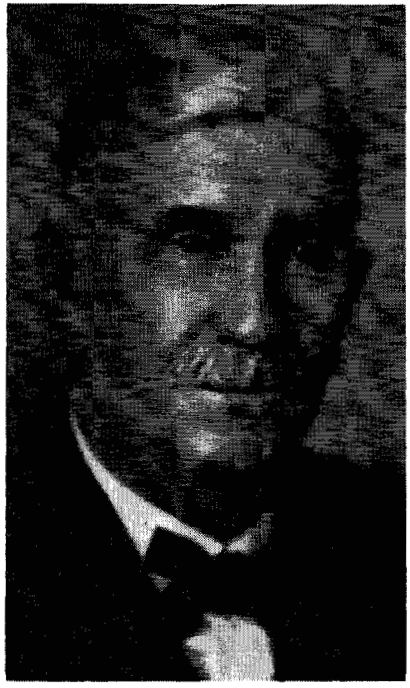

Fig. 2.—George L. Reid, a lawyer and public-spirited citizen of Tribune, who made available to the state without cost a farm of 100 acres for an experiment station.

AUTHOR'S NOTE

There is no record of an appropriation by the Legislature of 1911 for experimental work in western Kansas. Furthermore, the appropriation for the support of the college for the biennium contained no item for that purpose. The only reference to the matter is found in the March 4, 1911, issue of the **Kansas Industrialist** as follows: "The Appropriation Bill without further amendment, except for the addition of $10,000 for experimental work in western Kansas, passed the Senate Thursday." Since this item did not appear in the Appropriation Act as it passed the Legislature, it would appear that the House did not concur in the Senate amendment. The Appropriation Bill as it passed the Legislature contained an item of $22,500 for the support of experimental work. It was from this fund that the work at the Tribune Station was financed during 1912 and 1913. Dean Webster,[5] reporting on the matter, stated: "The stations at Hays, Dodge City, and Garden City have received appropriations for their own need, while stations at Ogallah and Tribune have been supported from general funds of the experiment station."[6]

4. Minutes of the Board of Regents, KSAC, April 7, 1911, Book C, p. 331.

5. Dean Webster was director of the Agricultural Experiment Station.

6. 18th Biennial Report of the Board of Regents of the KSAC for the period ending June 30, 1912, p. 33.

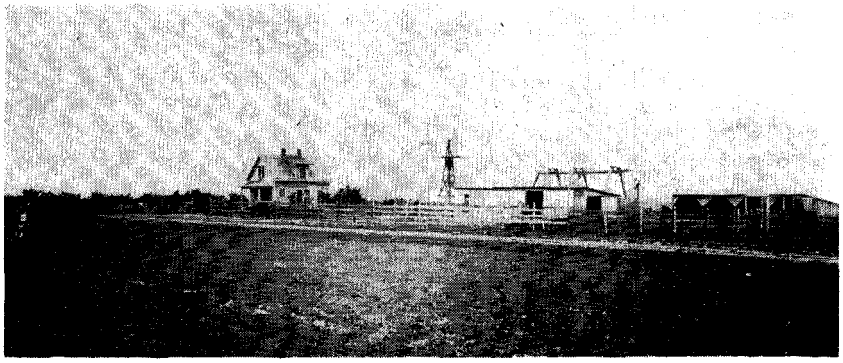

Fig. 3.—The Station Farmstead in 1919. Cattle shed and feed yards center and right. Seven-year-old windbreak trees at rear of house.

The farm consisting of 110 acres made available to the State was located in Greeley County two miles west of Tribune. Tribune is located midway between the Smoky Hill and Arkansas Rivers, 16 miles from the Colorado line. The location is representative of the high plains of western Kansas. Geographically, the farm is located at a latitude of 38° 28' and at longitude 101° 46'. The elevation is approximately 3,623 feet.

CLIMATE

The average annual precipitation at Tribune for the past 49 years (1913-1961) has

Fig. 4.—Visitors inspecting the weather station. Shelter belt trees 15 years after being planted in background. Rainfall records have been taken for over 50 years. Average annual precipitation has been about 16½ inches. Fortunately for crop production, heaviest rainfall occurs during the growing season.

been 16.62 inches. The driest year was 1934 with 7.76 inches and the wettest was 1915 with 33.39 inches. Most precipitation during any month, 11.48 inches, occurred in June, 1932; the least was in January, 1919, when there was no precipitation. Fortunately, for crop production, the heaviest precipitation occurs during the growing season. An average of the past 49 years, 12.90 inches of the total average of 16.62 inches, has occurred in the six summer months, April to September, inclusive. However, a considerable portion falls in showers of less than one half inch which are, in general, ineffective for plant growth. May, June and July are the months of greatest rainfall, averaging 2.69, 2.74 and 2.44 inches respectively. December, January and February are the driest with less than one half inch for any of the three.

Average length of the growing season from 1913-1961 inclusive was 161 days. Average date of the last killing frost in the spring is May 1, and the first killing frost in the fall, October 9. Latest killing frost on record was May 27, 1950; and the earliest, September 25, 1928. Shortest growing season was 123 days in 1943 from May 20 to September 20 and the longest, 193 days in 1957 from April 14 to October 24.

PERSONNEL

The first superintendent of the Station, appointed in 1912, was Charles E. Cassell. Mr. Cassell was a graduate of the College in agriculture with the class of 1910. He was an energetic painstaking worker who was not discouraged with meager facilities and limited financial support. He was successful in implementing plans for the early work of the Station and supervised the construction of the first units of the physical plant. Mr. Cassell resigned in 1917 to become county agent of Finney County where he felt there was opportunity to render greater service during World War I. He was succeeded by M. W. Kirkpatrick

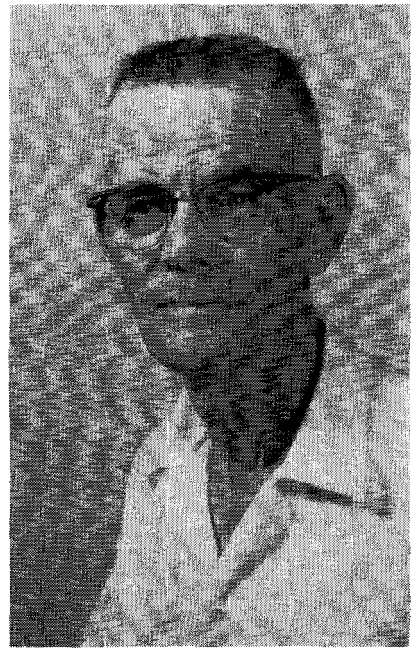

Fig. 5.—T. B. Stinson, superintendent since 1924. "His long tenure has given continuity to the work, and his and his wife's interest in the personal welfare of their constituents has endeared them to the people of Greeley County and western Kansas."

in 1918, by Ivan Mattson in 1919, and by G. E. Lowery in 1920 to 1924. All three were temporary during the war period, when well-trained persons were difficult to secure.

Bruce Stinson was appointed superintendent April 15, 1924. He completed work for a degree in agriculture at the College after assuming duties at the Station. He has served continuously since that time. During those 40 years (1924-1964) Mr. Stinson rendered service of inestimable value. His long term of service has given continuity to the work and his and his wife's interest in the personal welfare of their constituents has endeared them to the people of Greeley County and western Kansas. During the early part of his tenure. before the service of a county agent was available, the Station became the center of agricultural information and Mr. Stinson served not only in the capacity of superintendent but as consultant on agricultural matters to the citizens of the region.

STATION FINANCES

Work was started at the Station in July, 1911. During the first growing season in 1912. just enough money was used as needed for maintenance. Only $1,500 was expended the first fiscal year ending June 30, 1912, and the same amount in 1913. The first legislative appropriation for the support of the Station was in 1913 when $2,500 was appropriated for each of the two years of the biennium. Subsequent appropriations have been as follows:

1914	$ 2,500
1915	2,500
1916	2,500
1917	2,500
1918	2,000
1919	2,000
1920	2,000
1921	2,000
1922	2,000
1923	2,000
1924	3,500
1925	3,500
1926	3,500
1927	3,500
1928	3,500
1929	4,000
1930	3,750
1931	3,750
1932	4,000
1933	4,000
1934	4,000
1935	4,000
1936	4,000
1937	4,000
1938	4,000
1939	4,000
1940	4,750
1941	4,400
1942	4,500
1943	4,500
1944	4,500
1945	4,500
1946	6,000
1947	6,000
1948	5,500
1949	5,500
1950	8,000
1951	6,750
1952	8,680
1953	8,680
1954	10,000
1955	10,000
1956	9,929
1957	10,915
1958	26,013
1959	26,822
1960	28,639
1961	29,567
1962	32,232
1963	35,985
1964	37,439

PHYSICAL PLANT

The only improvement on the farm when it was acquired from Mr. Reid was a barbed wire fence on the south and west sides. The County Com-

missioners of Greeley County immediately financed the drilling of a well, which supplied ample water for domestic purposes and to irrigate a small garden and lawn but not enough for extensive irrigation of trees and field crops. The improvements made during the first two years (1912-1913) before legislative appropriations became available consisted of fencing the entire tract with a barbed wire fence, including an area of 60 acres for pasture; erecting a 10- by 11-foot workshed; installing a windmill and pump, and planting a windbreak of 200 trees west of the area to be used as a farm site. A team of horses and a few horse-drawn implements also were purchased.

The first major improvement was a house for the superintendent. It was built in 1914 at a cost of $1,800. The building was financed by using $600 of the legislative appropriations for each of the first three years starting in 1914. It was a satisfactory cottage with partial basement. Its low cost resulted from skilled labor largely donated by the superintendent's father-

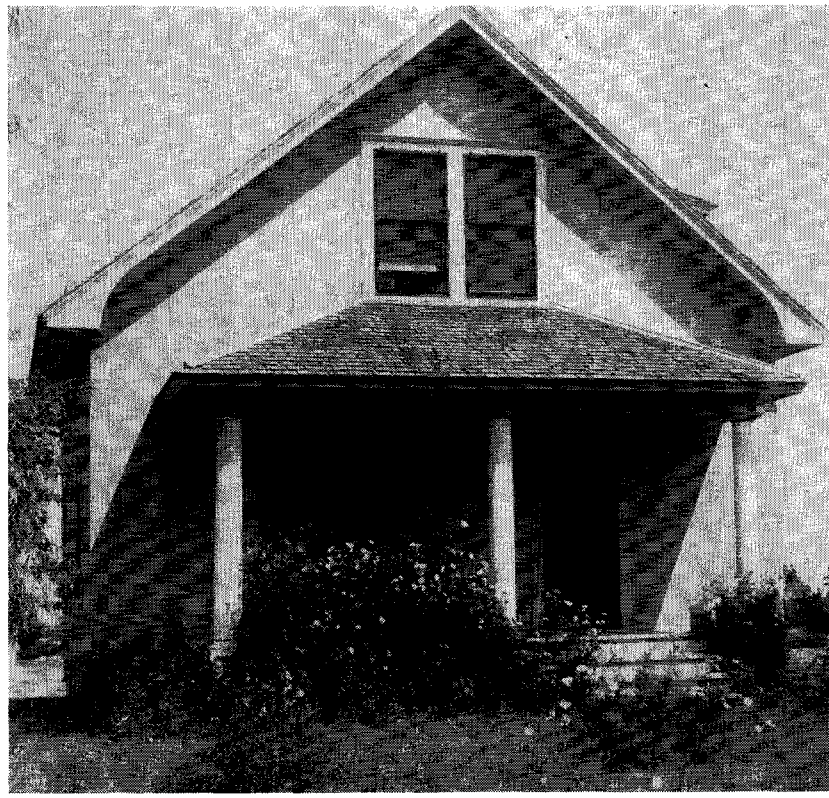

Fig. 6.—"The first major improvement was a house for the Superintendent. It was built in 1914 at a cost of $1800."

in-law, a carpenter. The house has been enlarged and improved through subsequent years as the need has arisen and as funds have been available.

An electric transmission line was built to the Station from Tribune in the summer of 1928 at a cost of $607. An automatic electric pump was installed in 1937 at a cost of $106.

A pit 48-ton silo was constructed in 1915. A second pit silo was constructed in 1921 and the first was dug six feet deeper, to 30 feet deep. Total capacity of the two silos was about 100 tons.

In 1918 a 40- by 14-foot, open-front cattle shed was built at a cost of $300.

The legislature of 1923 increased the Station's appropriation from $2,000 to $3,500 a year. The increased funds were used in part for a general purpose barn to house four horses, eight cows and calves, and storage for grain, hay, and roughage.

During the summer of 1927, a 22- by 24-foot office and garage building was constructed at a cost of $900.

In 1958 a machine shed 28 by 41 feet was built at a cost of $5,000, primarily to house the machinery used on the irrigation farm. In 1961 the superintendent's residence was remodeled and modernized at a cost of $6,800. The plant as completed consists of the cottage, a general purpose barn, two pit silos, a cattle shed, an office and garage building, a chicken house, and a machine shed.

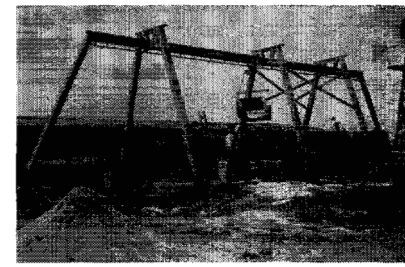

Fig. 7.—"A pit silo of 48 tons capacity was constructed in 1915. A second pit silo was constructed in 1921 and the first pit silo dug 6 feet deeper, making it 30 feet in depth. The total capacity of the two silos was about 100 tons."

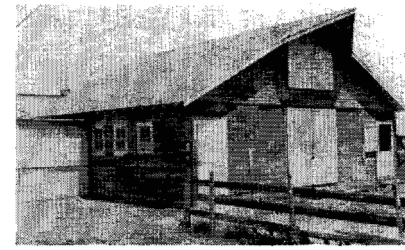

Fig. 8.—"The legislature of 1923 increased the appropriation for the Station from $2,000 to $3,500 a year. The increased funds were used in part for the construction of a general purpose barn. The barn provided housing for 4 horses and 8 cows."

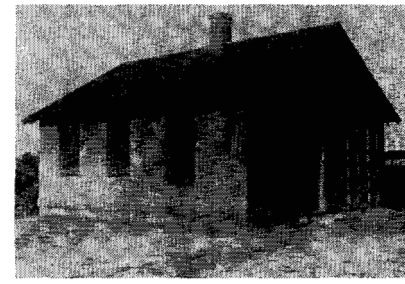

Fig. 9.—"During the summer of 1927 an office and garage building 22 by 24 feet was constructed. The cost of the building was $900. The building was constructed with the garage on the east side running the entire length."

EXPERIMENTAL WORK

Less than 2.5 percent of Greeley County land was cultivated when the Station was established. High crop prices during World War I rapidly changed the area served by the Station from native grass to cultivated crops. By 1940, 50 percent of the area was cultivated. High prices resulting from World War II completed the change. By 1954, 80 percent of the area was cultivated. Corn and forage sorghums were the principal grain crops from 1910 to 1930. Wheat and grain sorghum now are the principal crops, under a cropping system of roughly 1/3 wheat, 1/3 grain sorghum, and 1/3 summer fallow. Experimental work of the Station has been expanded to provide information of value in making essential farm adjustments. Three types of work have been stressed: First, agronomic studies—crop production and the use of summer fallow; second, crops adapted to irrigation; and third, improving farm homes.

Dryland Crop Production. All experimental work with field crops during the first 44 years was conducted under dryland conditions, without irrigation. The choice of crops to grow appeared to lie chiefly among sorghums, corn, winter and spring wheat, barley and oats. The most important factor determining the adaptability of sorghum and corn was drought resistance. Sorghum has more drought resistance than corn. Early experimental results indicated that it was a good practice to divide the acreage between corn and sorghum. When higher yielding combine types of grain sorghum were developed, they were so superior to corn that dryland corn al-

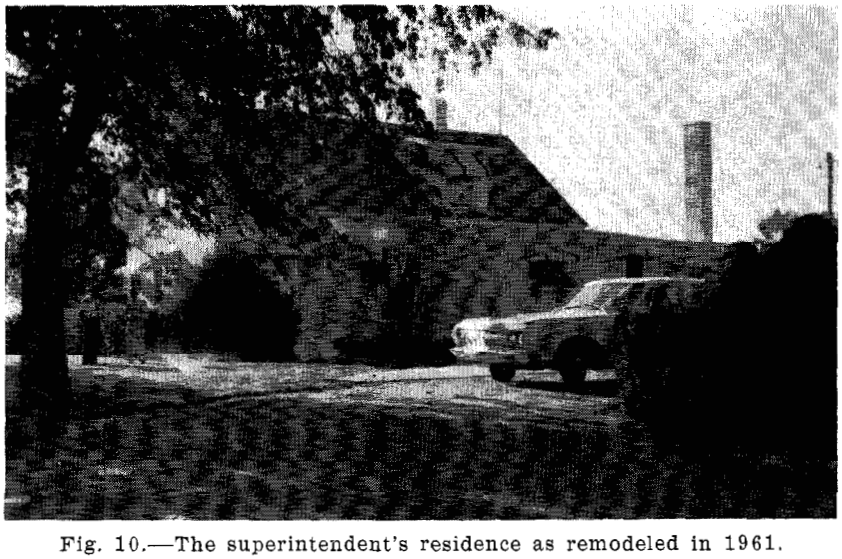

Fig. 10.—The superintendent's residence as remodeled in 1961.

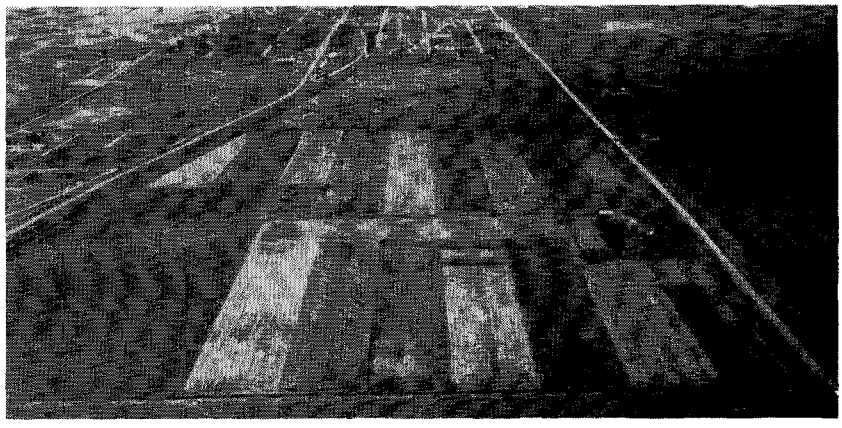

Fig. 11.—A view of the Station farm from the air shows field arrangement (1964). U.S. Highway 96 is on the right; Missouri Pacific Railroad, on the left; Station farm buildings, center right; and city of Tribune, in the background.

most completely disappeared from the region. Experimental work with dryland corn was discontinued at the Station in 1955.

Corn. Experimental work with corn consisted of testing varieties and planting dates. Early - maturing varieties adapted to short growing seasons proved best. Three of the better varieties (25 years' data) were:

	Average Yield
Cassell White	**14.5 bu./acre**
Hays Golden	**12.6 bu./acre**
Pride of Saline	**10.3 bu./acre**

Better hybrid corn produced about 2½ bushels more grain an acre than open-pollinated varieties.

Tests to determine the best

Fig. 12.—Wide-space method of planting corn. Since higher yielding combine types of grain sorghums have become available, they have proved so superior to corn that dryland corn has almost completely disappeared from the farms of the region.

Fig. 13.—Superintendent Stinson inspecting sorghum variety test plots. "Hybrid grain sorghums were planted first in 1954 and annually since that time. They have consistently produced higher yields than other types of grain sorghum."

time to plant corn (22 years' data) showed that corn planted between May 15 and June 1 produced about 2½ bushels more grain an acre than that planted as early as May 1.

Sorghums. Experimental work has been conducted with sorghum grown both for grain and forage. Red Amber and Black Amber were the principal varieties of forage sorghum when the Station was established. They were followed by Early Sumac and Leoti Red, for higher yields and better feeding quality. Ellis and Axtell, both white-seeded varieties, were developed in the 1940's. They have yielded well and are still the two main varieties grown for forage, though some hybrid forage sorghums are promising. Yields of the four principal varieties at the Station based on nine years are listed below:

Little grain sorghum was grown in the Tribune area when the Station was established. The sorghums grown were mainly of the forage type, Black Amber, predominantly. The Station planted 20 varieties of grain sorghum

Forage Variety	Grain	Forage
Early Sumac	19.0 bu./acre	3.45 forage tons/acre
Leoti Red	21.2 bu./acre	3.20 forage tons/acre
Ellis	19.2 bu./acre	3.21 forage tons/acre
Axtell	18.0 bu./acre	2.47 forage tons/acre

its first year (1913) as follows:

5 milos
3 durras
4 kaoliangs
1 shallu
1 desert wheat
6 kafirs

The milos and kafirs gave best results. They with feterita, all binder types, were the best varieties available until the 1930's when combine grain sorghums were developed. Wheatland, planted first in 1931, was the first combine type of grain sorghum planted at the Station. It matured too late for the region and was susceptible to milo disease. It was soon replaced by Westland, Midland and Martin, three of the better combine-type grain sorghums for the area. Two very early types, Norgum and Reliance, both developed in South Dakota, proved valuable as a catch crop when planting of other varieties was delayed.

Hybrid grain sorghums, planted first in 1954 and annually since that time, now consistently produce higher yields than the old varieties. Kansas Sorghum Performance Tests indicate that hybrid sorghum will increase yield of grain sorghum 25 to 30 percent. Lodging is a weakness of the hybrid types. It has retarded their acceptance by farmers. However, as early as 1958 it was estimated that 13 percent of the grain sorghums grown in Wallace, Wichita, Hamilton, and Greeley Counties were hybrid, and there has been a marked percentage increase since.

In addition to variety testing, experimental work with sorghums has included planting dates and rates and cultural practices, including the value of summer fallow. Planting in early June has given better results than May plantings when advantage was taken of the delay to kill weeds and to prepare a better seedbed.

In experiments on width of rows, Westland and Colby

Fig. 14.—"A field of Red Amber Sorgo on summer-fallowed ground. During 27 years summer fallow average annual increase of green weight of the crop was 2 tons, from 7,000 pounds to over 11,000 pounds an acre."

were used at 4 pounds per acre seeded with a semi-deep furrow drill. Six years of data (1947-1952) showed 20-inch rows yielded about 10 bushels an acre more than 40-inch rows on fallow and about 5 bushels more after wheat.

Summer fallow with forage sorghum (27 years' data) increased green weight of the crop from 7,000 to over 11,000 pounds an acre. While a marked increase in yield can be obtained by summer fallowing for both grain and forage sorghum, the method is seldom practiced because winter wheat has been a more profitable crop after fallow. Fallowed land usually is planted to wheat. Only when it is important to insure a feed crop are sorghums planted on fallow.

Winter Wheat. When the Station was established, winter wheat was not considered profitable. The superintendent of the Station in his annual report for 1914 wrote: "While wheat should not be encouraged as a major money crop for this immediate section, it is well to risk a limited acreage on well-prepared land each year, not to exceed 25 acres on the average farm. If the farmer insists on growing wheat as a money crop, it will pay him to use the best known methods of growing it. At the present prices of seed (World War I years) it is very hard indeed to refrain from planting and attempting to grow this crop."[7]

7. Cassell, Charles E., Annual Report, Tribune Branch Experiment Station, 1914, p. 33.

It was not until better equipment for growing the crop was available and more reliable information available regarding how the crop should be grown that winter wheat became dependable in the Tribune area. Experimental work of the Station contributed needed information. The experimental work consisted of variety testing, seedbed preparation, rate and date of seeding, and use of summer fallow.

Factors that contributed most to successful wheat production were introduction of summer fallow and invention and use of power-farming equipment that made summer fallowing economical and practical. Summer fallow was first used experimentally at the Station in 1914 but it was not until efficient power-farming equipment became available in the 1920's that economical methods of fallow were possible. With the introduction of fallow, winter wheat that had almost invariably failed became a reasonably dependable crop. During 21 years between 1928 and 1961 an average of 19 bushels of wheat to the acre has been produced after fallow. There were but three years when the crop failed due to drought. Yields of more than 25 bushels an acre were secured 11 years.

In an 11-year (1946-56) study on best time to start fallow for wheat, starting cultivation for fallow in early spring (April) produced an average of 23 bushels an acre compared with 18 bushels when cultivation was started

in June. Increased yields were secured also when a basin lister was used to prepare fallowed land.

The Tribune Station has been used as a testing ground for adaptability of different kinds and varieties of wheat for western Kansas. The superiority of winter over spring wheat was soon determined, especially when winter wheat was planted on fallowed ground. Turkey types were found best and Kanred proved superior to most other varieties in early tests. Later superior varieties tested were Tenmarq, Comanche, Pawnee, Kiowa and Bison.

Spring cereals have been compared and varieties of promise tested. Spring wheat has proved of no value for the region, and oats and barley, while better than spring wheat, usually are not profitable.

Irish potatoes, planted on fallowed ground, have been one of the most dependable crops grown at the Station, except for three extremely dry years during the 1930's, and a similar period in the 1950's. The Irish Cobbler variety has produced an average yield of 73 bushels an acre as a 30-year average. Yields as high as 160 bushels an acre have been obtained.

Supplemental Pastures. A study on use of sudangrass and winter wheat to supplement native grass pasture was started in 1936. The plan was to make full or partial use of summer fallow. Winter wheat was planted on summer-fallowed land about August 15. It was utilized as pasture in the fall and until June 1 the next spring when it was plowed and the land summer fallowed until the next June when sudangrass was planted. Sudangrass was pastured from about July 1 until frost or an average of 71 days. The field was then summer fallowed until the next August 15 for winter wheat. Native buffalograss supplemented the annual pasture during June and in the fall after frost before winter wheat could be pastured. That project during 24 years provided an average of 71 days pasture of sudangrass for four animal units on 4.4 acres. The winter wheat provided pasture during 38 days in the spring and 21 days in the fall for 3.4 animal units on another 4.4 acre field. Twenty acres of native grass furnished pasture during June and about a month in the late fall. Thus, the 13.2 acres of cultivated land plus 20 acres of buffalograss provided pasture for four animal units for seven months, May 1 to December 1.

CROPS ADAPTED TO IRRIGATION

While the supply of underground water at the Tribune Station was not sufficient for general field irrigation, a number of areas in Greeley and adjacent counties have underground water for irrigation from deep-well pumps. An irrigation association of Wichita, Greeley, and Wallace Counties requested the 1957 legislature for an increase in the appropriation of the Tribune Station to enable it to in-

vestigate crops best adapted to irrigation and best methods of growing irrigated crops.

A $15,000 increase in appropriations for the Station for 1957-58 enabled it to start irrigation studies. The appropriation became available July 1, 1957, and Roy E. Gwin, Jr., a graduate of the College with practical experience with pump irrigation in western Kansas, was appointed September 1, 1957, to have charge of irrigation work. At first the work was conducted on irrigated farms in cooperation with farmers largely as demonstrational. During the first two years the work was on 10 farms in Wichita and on four farms each in Greeley and Wallace counties. The work consisted of fertility tests with sugar beets, grain and forage sorghum, corn and onions and variety tests with potatoes, onions, cantaloupes and cabbage.

While much valuable information was obtained, cooperating with farmers did not provide controls necessary for reliable experimental work.

Fig. 15.—Roy E. Gwin, Jr., appointed September 1, 1957, to have charge of irrigation work. He was a graduate of the University, has an M.S. degree and practical experience with pump irrigation in western Kansas.

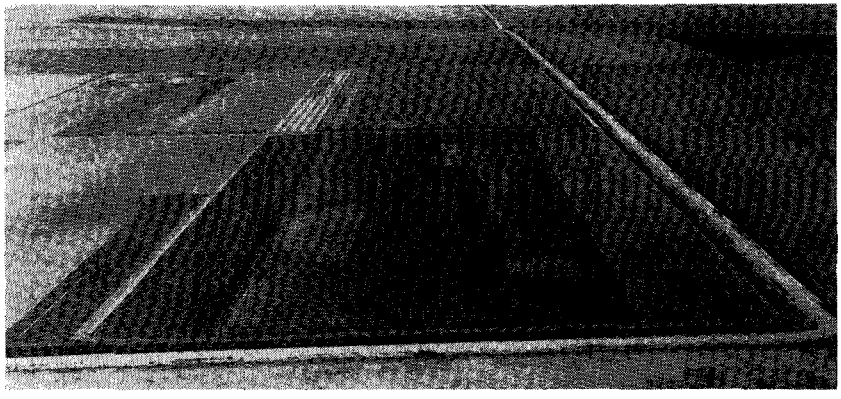

Fig. 16.—Birdseye view of the irrigation station farm. An 80-acre tract owned by Mrs. Martha Ross, 5 miles east and 4 miles north of Tribune, has been leased since January 1, 1961.

Consequently, a farm of 80 acres was leased from P. H. Schroeder, 4 miles north and 1¼ miles west of Leoti. All the work except that with sugar beets was conducted on this farm during the 1960 season. In 1961 an 80-acre tract owned by Mrs. Martha Ross, 6 miles east and 4 miles north of Tribune, was leased, and has been used since then. Cash rent of $20 an acre a year is paid. The rent includes not only the land but an irrigation well, pump and engine. The well is approximately 170 feet deep, with the water level at about 130 feet, powered by an International Harvester 450-internal combustion engine that uses propane fuel at the rate of 4½ to 5 gallons an hour. The fuel costs 6½ to 7 cents a gallon. The pump operating at full capacity delivers about 600 gallons of water a minute. The open-ditch method of applying water was used until 1963 when pipe irrigation was installed.

Fig. 17.—The pumping equipment at the Station irrigation farm. Power is from an International Harvester 450 internal combustion engine that uses propane fuel. The well is approximately 170 feet deep, with the water level at about 130 feet. Operating at full capacity, the pump delivers about 600 gallons a minute.

The experimental work that has been conducted under irrigation consists of variety tests of corn, grain and forage sorghum, wheat, winter barley, potatoes, field beans, onions; fertilizer tests with wheat, corn, grain sorghum and castor beans; chemical weed control in irrigated onions and cantaloupes, and alfalfa seed production.

Two-year average yields of various crops under irrigation obtained during 1960-61 follow: corn, 151 bushels; wheat, 51 bushels; grain sorghum, 142 bushels; forage sorghum, 21 tons; popcorn, 73 bushels; and potatoes, 121 100-pound sacks of U.S. No. 1 grade. While commercial fertilizers have not increased yields of crops at the Tribune Station under dryland conditions, 40 pounds of nitrogen an acre increased irrigated corn yields from 72 to 97 bushels an acre and grain sorghum from 86 to 108 bushels an acre (3-year averages).

IMPROVING THE FARM HOME

A study of ways to beautify homes and improve living conditions on the high plains consisted of growing windbreaks and ornamental trees, planting fruit trees, growing a garden and flowers and maintaining a lawn.

Shelter Belts and Ornamental Plantings. In April, 1912, a shelter belt of 100 Green

Ash, 65 Honey Locust, and 100 Redcedar trees was planted. The Green Ash and Honey Locust were west of the future location of the farm house and the Redcedars far enough north to leave room for a fruit orchard and garden. The deciduous trees grew well during 1912 and 1913 without irrigation. The ground was kept cultivated to kill weeds and an abundance of moisture was maintained under the soil mulch. About 70 percent of the Redcedars survived the

Fig. 18.—Director C. Peairs Wilson (center), Mr. Gwin (left), and Superintendent Stinson (right) inspecting corn performance test on the irrigation farm (1964). Experimental work with dryland corn was discontinued in 1955.

two seasons. They were irrigated some from the farm well when surplus water was available. Replantings were made for Redcedars that died. In 1919 half the trees were re-

Fig. 19.—A field of grain sorghum under irrigation. Yields averaging as high as 142 bushels an acre have been secured.

Fig. 21.—Mr. Gwin inspects sugar beets with ditches ready for irrigation. "The open ditch method of applying water was used until 1963 with pipe irrigation since."

Fig. 20.—Date of planting corn on the irrigation station farm being inspected by Director Wilson (left) and Mr. Gwin.

moved, in diagonal lines, in the deciduous shelter belt. "The remaining trees made so great a growth that those removed were not missed and the shelter belt became one of the most inspiring things (agriculturally) in the county."[8]

Fig. 22.—Onions on the irrigation station farm (1964). Horticultural crops such as onions, field beans, potatoes, and cantaloupes have been grown successfully at the Station under irrigation.

The winter of 1919-20 was hard on the Redcedar trees. Some were killed and others damaged by late spring freezes. The deadwood was removed and most of the trees survived. All the deciduous trees, including a later planting of Russian Olives, did well. In 1923 there were 223 trees growing on the Station as follows: 94 Green Ash, 54 Redcedar, 33 Honey Locust, 21 Russian Olive, 11 cherry, 9 plum, 4 cottonwood, 2 arbor vitae and 1 catalpa. Up to then Green Ash had done better than any of the others — not one had died in the preceding four years. Honey Locust and Russian Olive did about as well. Six Chinese

8. Mattson, Ivan, Annual Report, Tribune Branch Experiment Station, 1919, p. 28.

Fig. 23.—Landscape plantings in 1925, 13 years after planting. Russian olive on the left, Catalpa on the right.

elms were planted in the spring of 1925. The Green Ash trees were watered once during 1926, the first time the deciduous trees had to be watered. In 1931 additional plantings were made as follows: a row of arbor vitae on the west side of the office; a Silver Redcedar, a Pfitzer Juniper, a Pyramidal Chinese Juniper, and a Cannant Redcedar, all planted around the office, a row of spirea on the west side of the garage, and a hedge of Amur River privet north and around the driveway. In 1932 three rows of Western Yellow Pine, 11 feet between rows and 8 feet apart, were planted south of the barn and feedlots. Two extremely cold periods in 1932-33 killed about half of the Yellow Pine as well as the arbor vitae hedge. The pines were replanted but the hedge was replaced by a hardier species.

Fig. 24.—A western yellow pine planted in 1932 (photographed in 1964). It was one tree from three rows planted south of the barn and feedlot. It has survived without irrigation.

In the spring of 1938 a windbreak of Chinese elms was planted 100 feet north of the Redcedar windbreak. They grew satisfactorily except for some damaged by rabbits. The damaged trees were replaced the next spring (1939). This planting of Chinese elm and Redcedar served as an effective windbreak to protect the orchard and garden.

The trees on the Station survived the dry years of the 1930's remarkably well. Older ones suffered most and some were replaced. In 1941 the superintendent reported: "The trees on the Station withstood the long drought in fine shape and most of them are in good growing condition. . . . The Chinese elm wind-break continues to make a very good growth."[9]

The most severe setback to the shade and windbreak trees occurred May 29, 1951, when a severe hailstorm practically defoliated them. Many small branches were broken and bark on larger branches severely damaged. They never fully recovered. The hail damage followed by dry years of the 1950's killed many trees and stunted the growth of others. The deciduous trees suffered more than the cedars and pines. Dead trees were removed and replantings made. The windbreaks and

9. Stinson, T. B., Annual Report, Tribune Branch Experiment Station, 1941, p. 95.

the ornamental plantings have been largely restored.

Fruit Trees. The first fruit trees planted on the Station in 1915 consisted of three each of Mount Morencia and Early Richmond cherries. Additional cherry and plum trees were planted in 1922. In 1928, two varieties of cherries, six peach, four apple, and eight plum were planted. It was not until 1939 that any substantial planting of fruit trees was made. That year 39 fruit trees were secured from the Cheyenne, Wyoming, Field Station for trial plantings. They consisted of two trees each of 10 varieties of apples, two pears, nine plums, six cherries, and two Chinese apricots. They were planted 25 feet apart in rows 30 feet apart. The trees were watered when set out but received no other water than that supplied by the deficient rainfall of 1939. They failed to grow satisfactorily: many died during the winter of 1939-40 and were replaced. The 10 years of the 1940's were reasonably good for fruit production, with only one complete failure (1946): five good years and partial crops were produced the other nine years. The most dependable fruit was Apata- and Hanska-type plums. An Apata plum tree planted in 1933 produced 127 pounds of plums in 1942. Sour cherries have proved second most dependable. Apples, peaches, apricots, and pears have been much less satisfactory, although in 1937 one apricot tree produced 3 bushels of high-quality fruit.

The severe hail of 1951, followed by the dry years of the 1950's, completely destroyed the fruit orchard. It was replanted in 1956 with 12 apple, 8 apricot, 8 peach, 8 plum, and 12 cherry trees, all dwarf type. A severe storm in March, 1957, broke many off at the surface of the ground. Survival of replantings made in 1958 and 1959 has been poor, so dwarf trees have not been satisfactory.

Grapes. An attempt was made to grow grapes in the spring of 1927 when six vines each were set of Cattaba, Concord, and Delaware varieties. In 1928 Ellen Scott and Brighton varieties were added. All winterkilled to the ground each winter, and the project was discontinued in 1932.

Vegetables. Experiments have been conducted to determine the kind and variety of vegetables that could be grown successfully without irrigation, except for water from the farm well, pumped first by a windmill and later by an electric motor. The water for irrigation was divided among vegetables, flowers and ornamental shrubs and, in later years, a small lawn. The garden was protected from wind by a shelter belt of trees on the west and north, by windbreaks of shrubs on the south and by the house and farm buildings on the east. Additional protection on the south was usually provided by a few rows of thick, irrigated corn. Despite the protection, wind was a serious hazard and made vegetable growing difficult.

Diseases and insects have been difficult to control and water in adequate amounts was not always available. It was also difficult, because of the competition of other farm work considered more important, to give timely attention to the garden. Despite those limitations, it has been possible to produce most of the vegetables used in the farm home. While failures have occurred, they have usually not affected all kinds of vegetables in one year. The vegetables proved reasonably dependable are: Beets, peas, carrots, string beans, parsnips, cabbage, loose and head lettuce, onions, radishes, turnips, dill, tomatoes, sweet and Irish potatoes, pumpkins, squash, cantaloupes, watermelons, cucumbers and sweet corn.

Strawberries. One of the most dependable garden crops has been strawberries. They were planted first on the Station in 1923 when 100 Everbearing strawberries were set. They did well and have been planted repeatedly since. The superintendent reported in 1926: "Strawberries do exceptionally well here and, when protected during the winter to keep them from blooming too soon in the spring, bear high quality fruit in abundance."[10]

Mastodon and Gem strawberry varieties were grown in the early years. In 1949 a few plants of Sioux were secured from the Cheyenne, Wyoming, Field Station but they were less satisfactory than the older varieties. In 1954 a new bed was started using Mastodon, Gem, Superfection, Streamliner and Red Rich varieties. Ogallah variety was planted first in 1961. Everbearing varieties have proved satisfactory when provided with ample water; they usually produce a satisfactory fall crop.

Flowers. Adaptability has been tested of as many different kinds and varieties of flowers as appeared promising and as limited space and water supply permitted. Flowers have been planted to beautify the farmstead as well as to determine their adaptability. The first plantings of importance were made in 1927 when the following flowers for transplanting were received from the College: Cosmos, portulaca, asters, snapdragons, verbenas, calendulas, golden glow and chrysanthemums. Zinnias and sweet peas were planted from seed. Other flowers grown have included nasturtiums, petunias, phlox, four o'clocks, cockscomb, gladiolus, tulips, poppies, hollyhocks and geraniums.

In 1942 a planting of chrysanthemums in cooperation with the Cheyenne, Wyoming, Field Station consisted of 45 varieties with six plants of each variety, a total of 270 plants. They were planted April 28 on land that had been summer fallowed, and were watered when planted. They were irrigated only once during the growing season. They grew well. Six of the varieties were in full bloom August 15,

10. Stinson, T. B., Tribune Branch Experiment Station, Annual Report, 1926, p. 63.

and all except two of the remainder by October 10. They bloomed freely until November 15, after several hard freezes. The plants remained for five years and were one of the most attractive plantings on the Station. Fourteen varieties of roses were planted in 1942 and 65 bushes were

Fig. 25.—Superintendent and Mrs. Stinson in the Station flower garden (1964). "An effort has been made to test the adaptability of as many different kinds and varieties of flowers as appeared promising and as the limited space and the water supply would permit. The flowers have been planted to beautify the farmstead as well as to determine their adaptability."

planted in 1961, including 10 baby and four climbing roses. All did well with proper care and abundant water.

Lawns. Buffalograss, established by transplanting sod, was the lawn in the early years at the Station. Buffalograss is easily established that way, makes a good turf and can be grown without irrigation. It has the disadvantage of turning brown with the first frost in the fall, remaining brown all winter and greening up slowly in the spring. A more attractive lawn was desired. Consequently, it was decided to replace buffalograss with bluegrass in 1937, when an electric- driven automatic pump was installed. About half the buffalograss sod was plowed so bluegrass could be planted. Additional bluegrass plantings were made in subsequent years. Since 1939 as much of the lawn as could be irrigated has been bluegrass, with the remainder buffalograss.

Fig. 26.—Foundation plantings and the Station lawn. "Since 1919 as much of the lawn as could be irrigated with the limited supply of water was maintained in bluegrass and buffalograss was used on the rest. Excellent results have been secured with irrigated bluegrass and a beautiful lawn maintained most years."

A small area of the lawn was set to velvetgrass plantings in May, 1950. It was not winterhardy and it turned brown during the winter, so it was not grown after 1953.

MAKING RESULTS KNOWN

The results of the work of the Station have been made known through publications, field days, and by farmers and others visiting the Station. Three bulletins of the Agricultural Experiment Station giving the results of the work of the Station have been published: Bulletin #250, "A Report of the Tribune Branch Agricultural Experiment Station," March, 1930; Bulletin #425, "Tribune Branch Agricultural Experiment Station — Report on Corn, Sorghum, Sudangrass, and Safflower," September, 1960, and Bulletin #433, "Tribune Branch Experiment Report on Wheat, Barley, and Oats," March, 1961. Results of the work of the Station have also been published as part of many other publications of the Central Station as well as in numerous articles in farm magazines and newspapers.

Field days have been held regularly, with a Small Grain Field Day in the spring and a

Sorghum and Row Crop Field Day in the fall. Attendance at the field days has varied from a few to several hundred. At a 4-H Club Achievement Day in 1935, 325 attended and at a Poultry Demonstration Day in 1936 over 100 attended. Students from vocational-agricultural high schools and farmers on Extension tours have also visited the Station. Exhibits have been prepared for county fairs, giving results of Station work. Small groups of farmers and individuals have also been welcomed.

Popularity and value of the Station to the area have increased markedly with the irrigation studies now under way.

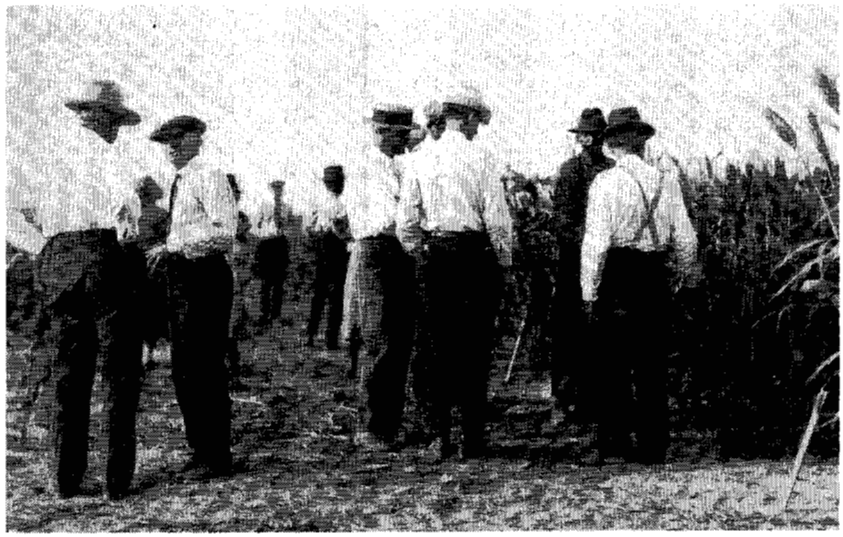

Fig. 27.—Visitors inspecting the sorghum variety plots in 1925. J. K. Freed, second from left, a practical farmer plant breeder, originated Freed Sorgo.