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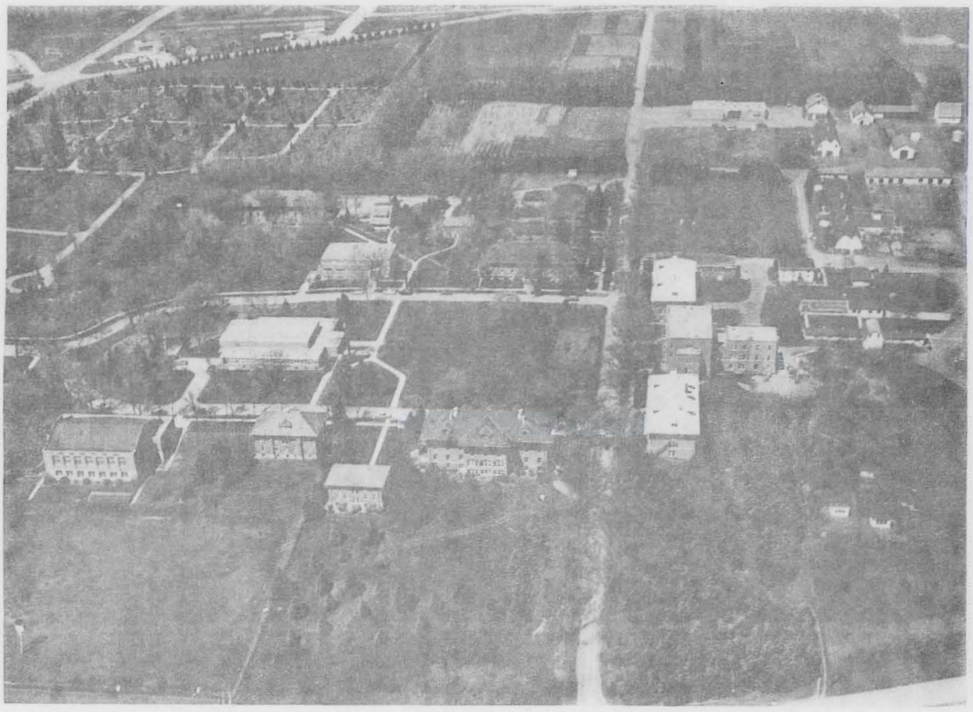
West Central Experiment Station



Agricultural Experiment Station
University of Minnesota

1910-1964

Roy O. Bridgford

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INTRODUCTION
AND HIGHLIGHTS IN THE HISTORY
OF THE WEST CENTRAL EXPERIMENT STATION

The establishment of the West Central Experiment Station 56 years ago coincided with the opening of the West Central School of Agriculture which became operative in October 1910.. The site, a tract of some 292 acres of land with a few old buildings, lying adjacent to the city of Morris was first used by an order of Catholic sisters as a Mission School. For a number of years the United States Government conducted an Indian School, but this was closed in 1908 and the Indians transferred to other schools. Legislation concerning the transfer of this property could be summed up as follows:

A bill was introduced into the United States Congress in 1908 to transfer the property, land, and buildings to the State of Minnesota for the purpose of establishing a school of agriculture and experiment station. The bill was passed and signed by President Roosevelt. A similar bill was introduced and passed by the Minnesota Legislature with plans formulated to start both the school and experiment station in 1909, but circumstances prevented its opening until a year later.

Superintendent Smith of the Morris Indian School received notice from the Indian Department that the school would be closed on July 1, 1909, and instructions regarding disposal of the personal property and other matters related to the closing of the school. The laws under which the school was granted to and accepted by the state provided that the school should be turned over on July 1, 1910. Actually, as far as the United States Government was concerned, it was understood that the Indian Department was willing to turn the school over to the State of Minnesota by departmental order on July 1, 1909, but the state would have no money available from direct appropriations for running the school until 1910. It was hoped that the Regents, who would have charge of the school, would find means of starting the agricultural school the next year. In June 1909 a meeting was held in Morris to consider the situation. Prominent citizens spoke on the question of how to raise the $10,000 necessary to operate the institution the following year. No decision was reached, however, and a committee appointed to study the question failed to come up with a solution. Later in September of the same year, the Honorable A. E. Rice, a Regent of the University, and D. D. Mayne, principal of the School of Agriculture, visited Morris to inspect the Indian School with a view to its use as an agricultural school. The matter of opening the school in the fall of 1909 was dismissed from consideration since it appeared there was insufficient time for making the necessary changes. Under such circumstances the school might get off to an undesirable start. It was regarded as necessary to spend $10,000 to rearrange the dormitory, fix the heating plant, and make other minor repairs. Regent Rice also felt that it would be necessary to spend $30,000 to $40,000 for more buildings, particularly housing facilities. While he talked rather discouragingly of the immediate prospects of the school, he seemed well pleased with its location and the adjacent farm land. He commented on the admirable quality of the soil and its adaptability for experimental work.

Plans were then made to open the school in the fall of 1910. E. C. Higbie, who was at the time superintendent of schools at Canby, Minnesota, had been employed by the Regents as the first superintendent. He arrived for duty in August 1910 and immediately advised the people of the area that the school would open October 3, 1910. Approximately 100 students were registered for the first term, but there was no experimental work until the following year.

The original farm was 292 acres. In addition 57 acres were rented from L. C. Spooner, 10 acres from George Darling, and 7½ acres from the Cemetery

Association. These last three tracts were later purchased by the University.

Buildings on the grounds (estimated value) included an office, $15,000; agronomy building, $12,000 (later remodeled and used for music); dining hall, $2,000; laundry, $4,000; hospital, $10,000; cottage, $2,500; warehouse, $1,500; ice house, $100; machine shed, $50; barn, $2,500; silo, $450; and a morgue, $200 -- a total value of $80,300. Few of these buildings were in first class condition, and reports were that the janitors, plumbers, and carpenters were kept busy repairing and keeping them useable. The state legislature was most cooperative. It lent a sympathetic ear to the requests for appropriations, and ample funds were provided to get things started. A letter from Representative Spooner to the local newspapers late in April 1911 pointed out the details and uses of the $221,500 appropriation for the new agricultural school. The sum of $10,300 was to be available immediately to reimburse the Citizen's Bank for money advanced during the current year on Spooner's personal guarantee. Other items were earmarked as follows:

1.	For maintenance available for the fiscal year ending July 31, 1912	$19,750
2.	For maintenance available for the fiscal year ending July 31, 1913	19,750
3.	For maintenance of farm, available immediately	2,000
4.	For improvements of grounds available for the year ending July 31, 1913	2,000
5.	For maintenance for the current year, available immediately (out of which will have to be paid the money which Mr. Spooner borrowed to carry on the school to the present time with interest at 6 percent.)	10,300
6.	Girls' dormitory, available for year ending July 31, 1912	50,000
7.	Boys' dormitory, available July 31, 1913	50,000
8.	Central heating plant, available for year ending July 31, 1912	35,000
9.	Equipment and sidewalks available for year ending July 31, 1912	6,500
10.	Horse barn, available for year ending July 31, 1912	2,000
11.	Machine and wagon shed, year ending July 31, 1912	1,000
12.	Hog, sheep, and poultry buildings, year ending July 31, 1912	1,500

Other Items to Be Available July 31, 1912

13.	Construction of a cistern	1,500
14.	Construction of a cow barn	700
15.	Basement for the laundry	400

16.	Hospital repairs	$ 100
17.	Salaries for teaching agronomy and home economics	1,500
18.	For water, light, and sewage	3,000
19.	Equipment for buildings	2,500
20.	New machinery	500
21.	Fencing farm and grounds	1,000
22.	For drainage purposes	1,000
23.	For the purchase of teams	1,000
24.	For the purchase of livestock	2,500
25.	Equipment for dining hall and kitchen	2,500
26.	Equipment for library and office	1,500
27.	For the expenses of moving cottages and repairs available for the year ending July 31, 1913	1,000

During the first part of August 1911 the Regents awarded the contract for the central heating plant to F. A. Hancock of Morris, the contract calling for completion of the plant by November 1, 1911. Some delay was encountered, however. A School News item appeared December 8, 1911, indicating that the central heating plant would not be finished until about Christmas.

With funds available, a real transformation took place during the next 4 or 5 years. Weeds which had flourished on the campus site began to disappear, to be replaced by luxuriant blue grass lawns; shrubs and trees were planted; and a large number of other improvements were made in accordance with plans prepared by Morell and Nichols, landscape architects. An enlarged quadrangle was provided and several roads constructed through the campus: two leading into Fourth Street, one south to the Cyrus Road, and one north to Seventh Street. The superintendent's cottage was moved back. By 1916 it seemed a transformation had taken place--an entirely new set of farm buildings had replaced the old shacks of 6 years before. The new dormitories had been erected; a new dining hall, a model dairy barn, and a farm cottage said to be "an ornament to the campus" also had been added. Only the old dining hall and agronomy building remained in 1916, and the former was razed in 1917. The agronomy building was later remodeled for use by the music department and is the only campus building remaining from the Indian School days.

The farm also had undergone some drastic changes with a view towards weed control and uniform fields. Reports stated that the farm was "made over" and "now supported luxuriant fields of alfalfa and clean fields of corn and grain, which would have astounded our predecessors." The entire farm and campus had been drained and unsightly spots removed. The most desirable land north of the campus was plotted for experimental purposes, several hundred of which had been set up in 1915. All of this bore excellent testimony to the desire of the administration and personnel for the establishment not only of a good school of agriculture, but for an efficient experiment station as well.

The experiment station staff in 1915 consisted of four men: Edgar C. Higbie, superintendent; Paul E. Miller, agronomist; Arthur Woodman, engineering; and Phillip S. Jordan, animal husbandry. E. J. Volden was employed as cashier on June 1, 1915, later became business office manager, and also taught courses in bookkeeping and commercial law. Volden retired June 30, 1955, after serving 40 years. Higbie served as superintendent of the West Central School and Experiment Station from its inception in 1910 until 1917 when he resigned and was succeeded by Miller.

Theodore E. Odland replaced Miller as agronomist in 1917, and John A. Anderson became the first horticulturist the same year. He had previously been on the staff of the School of Agriculture as a music instructor in 1916 and 1917. The writer joined the staff as agronomist in September 1918.

In 1918, after 7 years in operation, the experiment station had made considerable progress in setting up some experimental projects in agronomy, animal husbandry, and horticulture. While the total amount of land owned by the University of Minnesota at this time totalled 292 acres, there were only about 40 to 50 acres suitable and available for long time experimental projects or uniform enough to use for varietal trials of grains or legumes. The campus and building site covered approximately 40 acres. The balance of farm land was devoted to raising feed crops, while the major portion of the hilly land east of the Pomme de Terre River was used for pasture and grazing purposes. Approximately 30 acres of the so-called river bottom land was very sandy and inclined to be droughty under subnormal rainfall. This area was not dependable for much cropping and, for the most part, was kept in grass. In later years, because of access to a plentiful water supply, it seemed desirable and expedient to utilize all or a considerable portion of this sandy area for housing brood sows and carrying on a part of the swine breeding program.

During the formative years of the experiment station, many of the buildings in and around the campus needed repairs. There was questionable plumbing and, in many cases, obsolete electrical wiring and conduits. Others were razed as money became available for new buildings. Farm machinery was wearing out, and a list of carpentry and cement jobs always needed attention. Fortunately, there were some very capable, skilled, dedicated men on the civil service staff who had the "know how" and could be depended upon to take care of these repairs and keep the entire physcial plant operating smoothly, especially Albert Anderson and Julius Felt. Anderson had the title Chief Engineer, which was really a misnomer as he was also skilled in plumbing, blacksmithing, and electricity, and was unexcelled as a repair man or "fixer" of broken items. It seemed there was nothing he could not make when necessary or fix in an emergency. The writer well remembers the first experiment station plot thresher which Albert fashioned from scrap material: A small "coffee grinder" of an outfit, simple to operate and reasonably efficient, which was utilized for several years for threshing small plots of grain. He also served many semesters as blacksmith instructor in the School of Agriculture. He was never too busy to take care of emergencies, night or day. Many nights he responded to calls from the campus to thaw out frozen water pipes, adjust radiators, replace blown fuses, or make numerous other repairs. Anderson retired in 1951 after 40 years of continuous service, the longest tenure of any of the civil service employees.

Julius Felt, who joined the staff in 1918, was a master carpenter, but often doubled as a painter, plasterer, and cement worker. His skill as a carpenter and ability to impart the fundamentals to students earned him a place in 1928 as instructor in the woodworking shop of the School of Agriculture, a position he held for many years. His great practical knowledge and untiring patience combined to make him an ideal man for the job, and few if any of the

students, will forget his final admonition when giving an assignment, "Now boys, do a good job." Julius retired in 1947 after 29 years on the staff and died the following year. Because of their long and loyal service to the school and experiment station, and their many acts beyond the call of duty, it does not seem amiss to state that these two men were the unsung heroes.

In 1918 the station had only one tractor, a three-wheeled "Titan," but it was not suitable for field work and was used primarily for grinding feed. Practically all of the field work was done by horse labor for many years. Most of the farm machinery was old and inadequate but for budgetary reasons had to be kept in service as long as possible. Even at this date, however, emphasis was being placed on tractor power as evidenced by a tractor school held on the campus February 7 and 8, 1918, and again the following year.

On August 25 and 26, 1919, farm tractors of 10 standard makes were put on trial at the West Central Experiment Station for a plowing demonstration. Tractors represented were Fordson, Case (2 models), Moline, Waterloo Boy, Titan, Samson, Emerson Brantingham, Heider, Avery (2 models), and Cleveland Grip. Individual plowing demonstrations were held the first day, and on August 26 visitors saw hitches, draw bar pulls, belt pulls, and tractor troubles, as well as time demonstrations when all tractors plowed for a 2-hour period at an average depth of 7 inches. The demonstration gave those present an opportunity to compare the kind of work which the tractors were capable of doing. All of the tractor representatives did everything possible to make the demonstration a practical and successful affair, and at the time it was called the best tractor exhibition in west central Minnesota. The tractors varied in price, burned different fuels, pulled a different number of plows. Some unavoidable variation existed in the plot which each plowed, so some had plow trouble. Therefore, no decision was made among the various machines, the spectators being free to form their own opinions about the performance of each tractor under the circumstances. The amount of land which each tractor plowed was carefully measured and, for the record, the results are given in the following table.

Tractor	No. of Plows	Time	Acreage Plowed
Case 10 - 18	2	2.34	2.20
Cleveland Grip	2	2.42	2.31
Case 15 - 27	3	2.34	3.37
Heider	3	2.33	2.50
Moline	2	2.41	2.89
Avery	3	2.30	2.17
Fordson	2	2.45	2.46
Samson	2	2.38	2.90
Titan	3	2.42	2.51
Waterloo Boy	3	2.40	3.47

In commenting on the event, the Morris Tribune stated that the 2-day tractor demonstrations held at the West Central Experiment Station on August 25-26 attracted wide spread attention throughout Stevens County. Many interested visitors from adjoining counties came as well.

The entrance of the United States into World War I on April 6, 1917, and its effect on agriculture in general prompted a statement from Dean Woods of the College of Agriculture, St. Paul, to experiment station workers and farmers, concerning the agricultural situation of the time which emphasized the all important part that they must play in the successful solution of international difficulties. In commenting further, he said that "the progress of the war has demonstrated that the nation which will eventually triumph will be the one which can sufficiently nourish her people. The United States has furnished vast quantities of foodstuffs during the past 10 years to the nations of Europe. Last year the northwest experienced one of the shortest crops in the history of the country, and the same condition existed all over the country. This, together with heavy exports, has resulted in a nationwide shortage of cereal and livestock. The supply of wheat at present is the lowest in 40 years. The same is true of livestock. A nation's strength in wartime is in direct proportion to her ability to feed and nourish her armies and people.

"The northwest farmer is confronted with serious handicaps at the outset. Seed supply has been very short and of poor quality; farm labor scarce due to army recruiting. To perform a real service to the nation each and every farmer should make every effort to see that every acre is seeded to production crops and that we do everything in our power to increase production.

"This year the Morris Station will devote every available acre to the production of staple crops and pure seed for distribution another year. All breeding stock will be retained with a view to securing maximum production. The station staff offers its services to the farmers of Stevens County and western Minnesota at any time when it can be of assistance in the solution of farming problems. The station believes that because of the very serious situation, everyone should make a supreme effort to see that everything the farmer can produce that is needed both home and abroad is produced."

As indicated earlier, the West Central Experiment Station of the University of Minnesota has had six superintendents up to January 1, 1965. Higbie served until 1917 when he resigned to do graduate work at the University of Chicago and later at Columbia University in New York City. In August 1917, Miller became the second superintendent of the West Central School and Experiment Station. He resigned February 1, 1938, to become director of Agricultural Extension Service of the University of Minnesota, holding this position until 1954 when he received an appointment to the Board of Directors of the Federal Reserve Bank with headquarters in Washington, D. C.

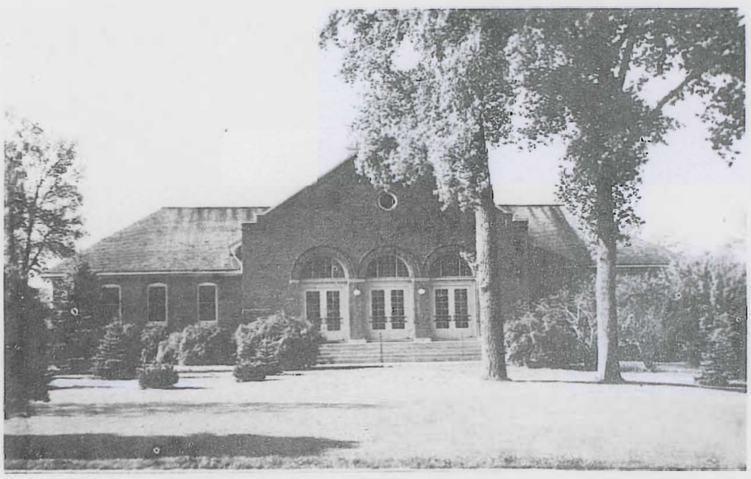
Theodore H. Fenske, a staff member at the West Central Station, was named acting superintendent on February 1, 1938, and on July 1 of the same year became the third superintendent, a position he held until July 1, 1947, when he left Morris to become an associate director of field operations for the Department of Agriculture, now known as the Institute of Agriculture. Allen W. Edson, a member of the staff since 1922, then became acting superintendent, and in December was named the fourth superintendent of the school and station, a position he held until his death on September 29, 1958. In November 1947 the Board of Regents created a new position of associate superintendent and appointed A. C. Heine to this post. Heine first came to Morris in 1917, served a period of service in the Navy during World War I, and later returned as head of the Agricultural Engineering Department. Heine served in the capacity of associate superintendent until July 16, 1949, when he was appointed to the position of superintendent of the Rosemount Agricultural Experiment Station.

Following Edson's death, H. G. Croom, a staff member since July 1, 1943, was appointed acting superintendent and served through the fiscal year 1958 to 1959.

The West Central Experiment Station, 1914

Superintendent's residence, 1910

Superintendent's residence, 1938



Auditorium--Library--Offices

On July 1, 1959, Rodney Briggs was officially appointed the fifth superintendent of the West Central School and Experiment Station, a position he held until July 1, 1961, when he received an appointment as dean of the newest branch of the University of Minnesota, which is now known as the University of Minnesota, Morris.

At the same time Ralph Smith, also a staff member, became the sixth and present superintendent of the West Central School and Experiment Station. The school was phased out, and the last class graduated in the spring of 1963. Smith is the only graduate of the school to hold the position of superintendent.

Some items of unusual interest concerning the work at the West Central Experiment Station began to appear in the press in 1919. One of the first concerned an exceptional beef animal which made headlines when sold on the South St. Paul market. In commenting on the transaction, the Morris Tribune on February 21, 1919, stated that:

"One of the highest priced steers ever on the St. Paul market was sold there on Wednesday. He brought 18½¢ per pound, weighed 1,170 pounds, and returned $216.45. Swift and Company were the buyers. The steer was bred and fed at the West Central Experiment Station under the leadership of Professor P.S. Jordan, who described him as a cross bred steer, between a shorthorn sire and an Angus dam, roan colored, with typical Angus conformation. He was born February 26, 1917, and lacked one week of being 2 years of age when sold. As a calf he nursed his dam and when about 2 months old was started on grain, but during the first year he was never given an excessive amount, 5 pounds a day being the maximum at any time. The idea was to keep him coming right along without allowing him to lose his baby fat gained while nursing the cow. In addition to grain he was fed corn silage and alfalfa hay. During the second year, his grain allowance was increased so that for the last 8 months he was getting 10 to 12 pounds of grain per day. The steer was an exceptionally good individual, conforming closely to the ideal beef type, i.e., short of leg, broad of back, and deep of body, and a deep covering of flesh laid on smoothly. A typical 'baby beef' production being just as fit for the market 6 months ago as he was when sold."

Jordan stated that he was a valuable specimen for use in class work in teaching boys the beef type finish and market requirements for beef cattle, and it was for that purpose that he was not marketed when 16 to 18 months of age.

At the St. Paul yards he was placed in a pen by himself so that all might have a good chance of seeing him. Very few steers reach St. Paul with as much finish and quality as this steer possessed, and it was frequently heard about the yard that it would be some time before the arrival of another as good.

Interest in the new institution was growing among the general public, with an increasing number of visitors present at each public event held. The attendance peak was reached at the annual Visitors Day on July 22, 1920. Plans had been made to handle 5,000 people from all parts of west central Minnesota, but it was estimated that a crowd of from 8,000 to 9,000 people crossed the station grounds during the day. While further information on this event is given later, it is apropos to mention here that the many attractions of the day such as a discussion of the Babcock Amendment, a baseball game, plot visitation, band concert, stock judging, and the piece de resistance, a free barbecued dinner, all helped to swell the attendance.

Some of the first trials with the use of phosphate were initiated at the West Central Experiment Station with the following publicity appearing on December 31, 1920: "In 1918 the West Central Experiment Station, in cooperation with

the Division of Soils, conducted a large number of cooperative experiments with farmers in Stevens County using acid phosphate on wheat, barley, and clover. The results of those experiments demonstrated so conclusively the value of acid phosphate on the average soil of Stevens County and so closely corroborated the long series of experiments at the station, that it is now believed that on the average farm acid phosphate can be used with much profit and will increase the yields of these crops several bushels per acre when used on lands that have not been recently covered with barnyard manure."

During 1921 a new form of acid phosphate, known then as treble superphosphate, was put on the market. It carried a higher percentage of phosphorus. thereby reducing greatly the number of pounds necessary to apply per acre.

The Soils Division at St. Paul obtained a carload of the new product, from which the West Central Station was able to secure a sufficient amount for several cooperative trials in Stevens and adjoining counties. One-acre plots were placed near a road then staked and labeled to enable others to see the results. In 1922 phosphate applications were made on 27 Stevens County farms and on 21 different farms in Traverse County. Applications were made in triplicate at the rate of 100 pounds, 50 pounds, and 25 pounds per acre. "No treatment" plots were maintained for check purposes.

Wheat, oats, barley, flax, and alfalfa were the crops used. Since the yield data secured from these plots are quite significant, the averages are reported in the table below.

Average Yields From Cooperative Plots in Stevens County - 1922
Applications of Treble Superphosphate Per Acre

Crop	100 lbs. Bu./A.	50 lbs. Bu./A.	25 lbs. Bu./A.	No Treatment Bu./A.
Wheat	19.81	17.65	15.84	13.27
Barley	32.89	29.54	25.93	19.10
Oats	46.13	43.87	40.62	26.73
Flax	15.53	16.04	14.18	15.36
		Traverse County		
Wheat	16.47	-----	-----	12.73
Barley	32.29	-----	-----	14.94

The work of the West Central Station, together with the cooperative trials conducted throughout the area, brought this valuable fertilizer to the attention of every farmer interested in increasing his net profit per acre.

The average yield for all wheat plots in Stevens County for the 100 pound treatment was 19.81 bushels per acre; barley, 32.89 bushels; oats, 46.13 bushels--representing increases of 6.54, 13.79, and 19.40 bushels respectively. On the one farm where acid phosphate was applied to flax, however, no favorable results were noted. But on one farm where alfalfa received a treatment of 100 pounds per acre the yield was increased 0.76 tons per acre.

More information on the use of phosphate at the station is reported later in this discussion.

An incident of importance to both the school and the station occurred on August 10, 1917, with the launching of a new publication called the West Central News, which was to be published monthly and sent to students and alumni. It was to be devoted to news, discussions, and personal items of special interest, but with the passing years it became increasingly important in dispensing news concerning the experiment station, special events, field days, etc. Examples include issues giving reports on the first Dairymen's Day, swine projects reports, material concerning the annual Crops and Field Day, and, recently, the June 1965 issue in which information was published on "haylage." Since this publication went out to alumni, former students, and department heads of the University of Minnesota, it was an excellent source of information for hundreds of people engaged in agricultural pursuits. Some personals concerning students and alumni are usually included, as well as a calendar of upcoming events for the next 2 or 3 months. The School News is now issued quarterly.

In the August 1917 issue an item appeared to the effect that ground was to be broken soon for the new combination dining hall and gymnasium. The building would have a large modern dining hall on the first floor and a gym on the second with showers and lockers for boys and girls. Completion of the structure was set for early 1918.

For economical reasons, during those early years it was the practice to use lumber from buildings that were razed to build new ones. After work was begun on the new dining hall, the old one was torn down, and from much of the lumber a new barn for beef cattle and a stock judging pavilion were constructed.

Also in 1917 the school and experiment station proved the value of an agricultural education where the employees of the Animal Husbandry Department, Farm Department, plot men, and gardeners were all either students or graduates of the West Central School. Perry Cook, a football player in 1916, was in charge of the swine; Victor Pearson, a senior, was working on the campus; Otto Swenson and Gerhard Quitney were in charge of the experimental plots. Others working on the farm included Curtis Shaw, Oliver Benson, Jens Jensen, and Herbert Ferrell. Chris Jensen was appointed farm foreman immediately after graduation in April. Since all of these were apparently doing satisfactory work, it became the policy of the administration to employ only student help whenever possible. In addition to the farm help, Clara Bolstad, also a graduate of the 1917 class, was given a position as assistant in music and general faculty assistant.

Other items selected from the School News indicated that many hundreds of people had been delighted with and inspired by the field experiments being conducted at the station. An extensive system of drives in and about the plots enabled thousands of people to inspect the work. Already many hundreds of farmers were taking advantage of the opportunity to observe the field demonstrations of experiments with various types of rotations, plots with fertilizers and manure, and the scores of grain varieties being tested at the station.

After some 7 or 8 years work, the station was in a position to furnish direct information concerning farm problems in western Minnesota. The results obtained from the numerous plots growing at the station put the institution in a position to be of great service to agriculture in the area. The first annual report of the work was published in 1915.

In 1931 the West Central Experiment Station made a special effort to stimulate the use of some of the new seed grains by offering both registered and certified seed for sale to farmers at bargain prices. Advance notices went out to the effect that the station was offering farmers an opportunity to get the latest productions, that growers contemplating the purchase of new seed stocks or planning a change to the newer varieties could now purchase these

grains at the lowest prices in years, and that there never was a more opportune time to start growing standard, approved varieties of pure seed grain. In commenting further, it was stated that "these varieties have established their worth in extensive trials under field conditions throughout the state, and by their exceptional yielding ability as well as resistance to disease." They bore the stamp of approval of the Minnesota Crop Improvement Association and the Division of Agronomy and Plant Genetics of the University of Minnesota. Among the approved varieties was a new oats named Minrus, being distributed to farmers for the first time, a cross between White Russian and Minota, combining the rust resistance of the former with the high yielding ability of Minota. Other strains for distribution were Anthony Oats, released in 1929; Red Wing flax, Glabron barley, Marquillo wheat, and Peatland barley, the latter particularly adapted for peat soils. Unfortunately the smooth awned strains of barley such as Glabron and Velvet were susceptible to loose smut, a disease that was causing considerable damage and could only be controlled by hot water treatment. Losses were running from 10 to 15 per cent in some fields of the county. Since proper facilities for carrying out this treatment were unavailable on the average farm, little or no grain had been treated with hot water.

In the spring of 1932 the West Central Experiment Station set up the necessary facilities and treated barley for the farmers. The writer was in charge of the project and arranged to treat up to 15 bushels per man. This enabled them to produce a substantial amount of smut free seed for another year, providing the treated grain was sown in a seed plot isolated 20 to 30 rods from other barley. A total of 550 bushels were treated during a 6-day period. Examination of some 20 fields prior to harvest indicated the success of the treatment; only a trace of smut was found in two or three of the fields.

Summer visitation days were held annually at the station. One of the most outstanding from the standpoint of the program and number of visitors was held on July 12, 1933. Lured, perhaps, by the offer of free barbecued beef, coffee, and ice cream as a supplement to their picnic lunch as well as a star-studded program, a record crowd estimated at 1,800 poured onto the campus, filling all the available parking space. They came for a combined crops and livestock day with animal husbandry and agronomy projects. As usual, visitors were conducted through the experimental fields during the morning with explanations on the various phases being given by Roy O. Bridgford, agronomist, with the able assistance of F. J. Alway, chief of the Division of Soils; H. K. Wilson, acting head of Agronomy and Plant Genetics; and others from the Plant Pathology Division.

The phosphate and manure rotation which had now been in operation 20 years seemed to attract the most interest, along with the new grain varieties soon to be released to growers.

Livestock had their inning, too. Station pure bred animals on display included the Shorthorns, Holsteins, Percheron horses, and Shropshire sheep. A horse judging contest was held with Professor W. H. Peters, chief of the University's Animal Husbandry Department, explaining the placings. Of equal interest was his demonstration and explanations of the proper methods of hitching four, five, six, seven, and eight horse teams.

Also of great interest to the farmers were the first reports on the experimental results obtained from the cross-breeding of swine. Three years data were available and were explained by L. M. Winters, animal geneticist from the Central Station at St. Paul. Since this was the first attempt at cross-breeding, there was still the question of whether or not it would be profitable and, if so, how much more profitable than the ordinary method of swine production, and how the commercial hog raiser should handle such a breeding

A barbecued beef dinner on Visitors Day

Dean W. C. Coffey and Prof. Andrew Boss at Station Day, 1936

The new heating plant, 1911

program. From results obtained here and at the Northwest Station, Winters indicated that there was a saving of 8.5 percent in feed in the production of a 220-pound cross-bred, and 9.5 percent feed saving in favor of a double cross-bred as compared to a pure bred.

The featured speaker on the afternoon program was Dean W. C. Coffey, who gave an interesting and instructive talk on recent developments in agricultural legislation, explaining at length the proposed wheat marketing plan being put into effect by Secretary of Agriculture Henry Wallace. Coffey stated: "We shall have to use more intelligence under the controlled plan than ever before. Cooperation is necessary, and, if the plans are to succeed, it is entirely up to the farmers to give that cooperation."

Considering that the entire country was being seared by one of the worst droughts in history with crop prospects anything but bright, the size of the crowd and its enthusiasm was most gratifying to the administration and the personnel.

Of great interest to livestock men was the first Sheep Feeders Day program held at the West Central Experiment Station in January 1927. An event destined to increase in popularity during succeeding years, it was the first meeting of its kind to be held in the state. It attracted farmers not only from Minnesota, but from neighboring states, to view the eight lots of Western lambs that had been fed for the previous 2 months and the results secured from the use of different feeds. Jordan, who had been in charge of the experiment, explained the rations fed and gave figures on the gain and cost of gains in the various lots. Professor Peters, who had cooperated in this first lamb feeding experiment, demonstrated the best type of feeder lamb. Following the morning program, a lamb dinner was served to approximately 200 farmers in the school dining hall, a popular custom that has been continued each year since 1927.

During the afternoon program, with Dean Coffey acting as chairman, Superintendent Miller outlined the purpose of the lamb feeding experiments, indicating that the addition of farm flocks and the fattening of sheep and lambs as a new enterprise on farms of west central Minnesota had brought new problems and questions for the farmer, and that the University was anxious to help solve some of the problems and answer the questions.

Other speakers were A. A. Dowell of the Extension Division, who discussed the opportunities in sheep raising and lamb feeding; Professor P. A. Anderson, who took up some of the parasite problems of the sheep raiser; and John W. Haw, special agent for the Northern Pacific Railway, who presented some pertinent facts on the buying and shipping of feeder lambs.

The Animal Husbandry Department again made headlines in May 1930 by acquiring two new herd sires, a Shorthorn and a Holstein, which, according to Jordan, would greatly strengthen the station herd of both breeds. The new Shorthorn bull, Hercules Golden Gift, was purchased at the International Livestock Show at Chicago, a beautiful roan in color and proclaimed by breeders who saw him to be one of the best bulls ever owned by the University. He was bred by the F. M. Rothrock Company of Spokane, Washington, which at the time owned one of the leading herds on the Pacific coast. The Holstein herd was strengthened by Sir Pietertje Mansell Ormsby from the Central Station at St. Paul. He was the son of the former world's record old cow, Mansell Johanna, and was sired by King Pietertje Mercedes Ormsby, the sire of the former 2-year old Queen Bess -- an acquisition with a world's record mother and a world's record sister.

The West Central herds continued making headlines in 1931 when Hercules Golden Gift, the herd sire, was awarded the Grand Championship over all Shorthorn bulls shown at the Minnesota State Fair. There were 55 entries in this class, the Morris animal taking a first place in the class of aged bulls, winning in the senior champion bull class, and finally topping the list by being made the Grand Champion Shorthorn Bull of the show.

Another first reported in the spring of 1927 was a Beekeepers short course held on May 12. Beekeeping had been gaining favor among many farmers, and this course was planned to give them the latest methods in the handling of bees. Every phase was covered, and hives from the station apiary were used in demonstrations. Professor Jager, chief of the Section of Beekeeping at the University, was the principal speaker assisted by B. L. Morehouse, a commercial beekeeper from Morris, and A. W. Edson, who had charge of the bees at the station.

Increased acreage of alfalfa and sweet clover in western Minnesota was an added incentive for those wishing to produce a good quality of honey. The West Central Minnesota Beekeepers Association had its monthly meeting during this short course.

Farmers also were becoming more interested in the new grains being increased at the West Central Station. Stem rust and other diseases had been taking their toll, and disease-resistant strains appeared to be the answer. Marquillo, the latest production of the red spring wheats, purported to be very rust resistant as well as a good milling strain, Anthony oats, Velvet, and Glabron barley were the varieties getting the most attention.

Short courses seemed to be the order of the day during the late 1920's. On June 26-27, 1928, a Land Owners course, the first of its kind, was held at the West Central Experiment Station. Featured the first day were disucssions of soil management, crop rotation, and weed control. Speakers included Alway, whose topic was "Soil Types and their Agricultural Value"; Superintendent Miller, who spoke on "Maintaining Soil Fertility on the Rented Farm"; and Professor A. C. Arny of the Agronomy Division and C. L. McNeily from Extension on "Weed Control Problems." Farm leases and farm management problems were discussed by W. L. Cavert and Professor Andrew Boss during the second day, which concluded with a trip through the experimental plots and fields.

Power Farming was the subject of a special, 1-day, short course conducted at the station on March 3, 1930, under the auspices of the Midway Tractor and Equipment Company of Willmar, Minnesota, assisted by the service dealers for caterpillar projects in this community. A number of trained men from the caterpillar organization gave illustrated talks dealing primarily with the use of tractors and combines in various farm jobs.

The worst drought in history struck the country in 1933 when only 15.31 inches of water were recorded for the entire year. Crops suffered, and the hot, searing winds added to the disaster. No cultivated crops were harvested from the station farm, and hay was so scarce that it was necessary to purchase several carloads of alfalfa from more fertile areas of the West to winter over the livestock. The drought continued into 1934 and by June was considered so acute that drastic steps were being taken. A relief program had been set up by the state, and in June 1934 Miller was appointed to head the Federal-State Drought Relief Program in Minnesota with headquarters in St. Paul. Dean Coffey was elected regional director for six of the northwest states, and plans

for preparing a relief program were rushed as rapidly as possible. Because Miller had lived in the midst of one of the worst sections of the drought area and had made a careful study of the conditions here and in the surrounding communities, his selection to direct the huge program was considered fitting. He possessed the necessary executive ability to push the relief program at the greatest possible speed and efficiency and was acquainted with the channels through which he had to work in order to accomplish the greatest good.

Meanwhile, on July 20, 1934, an announcement was issued by Acting Superintendent Edson that the Visitors Day program set for July 27 had been postponed.

The livestock situation was very serious due to lack of feed and pasture, and there were rumors of actual cases of starvation about the country. By August a government cattle buying program was in full swing, and in a press release Miller stated that "The purchase program is not only being extended to new areas but is faced with the pressing problem of moving cattle from large areas where water has failed completely." The extent of the devastation was fast extending into the Dakotas, Kansas, Nebraska, and into areas as far away as Missouri, Arizona, and California. There was little if any surplus feed in the country, with supplies in sight scarcely enough to meet 10 percent of the demands. Corn stalks appeared to be the only roughage in many areas, and there was some question as to the value of moving them very far. "Railroads and packing plants were taxed to the limit moving and slaughtering cattle," according to Miller. He also said that by August 1 there had been 1½ million cattle slaughtered with probably 4 to 6 million to be disposed of. Some young stock were moved for grazing into the southeastern states and into northern Minnesota; good dairy cows went to relief families who were in a position to keep them. Some were inclined to call it the most serious situation of the country.

Informative items from the annual report by Superintendent Fenske on June 30, 1945, indicated that the past year had been a busy one for all personnel. It was the 35th year of operation for the school and station. A record enrollment of 445 students exceeded the previous high of 385 set in 1934-1935 and more than taxed the available facilities. Of the 445 students, 402 listed farming as their parents' occupation.

Staff members were called upon for many types of service besides their teaching and experiment station duties. Fenske's records showed that staff members spoke at 56 meetings, most with agricultural themes. Total attendance at the meetings was approximately 7,000. He also pointed out that the experiment station work was carried on in cooperation with divisions at the University Farm and the other branch experiment stations. Seventeen definite projects were being conducted in crops and soils, four in horticulture and farm forestry, three in animal and dairy husbandry, two in agricultural engineering, and one in poultry. The experiment station also distributed 1,700 bushels of pure seed of the new varieties grown during the year. At this time the University investment at Morris in land, buildings, livestock, and equipment totalled approximately $1 million.

Two rather serious fires occurred at the school and experiment station during the late 1940's, the most serious on October 5, 1949, when the girls' dormitory was heavily damaged from a fire of unknown origin. Fortunately, it occurred in the daytime, and the building was quickly emptied with no serious injuries to residents. The attic and third floor were completely destroyed, and there was considerable water and smoke damage on the lower floors. This building was built in 1912 with three floors, but, following the fire, was rebuilt as a two-story structure.

Disaster struck again the following year. On July 13, 1950, a fire of undetermined origin caused heavy damage to the large dairy barn. The blaze spread through the tile and frame building with startling speed, leveling the top of the structure and destroying some 40 tons of alfalfa hay that was stored in the mow. Fortunately, no livestock were lost since only the one animal, the station herd bull, was in the barn at the time, and he was taken out immediately by the employees. The fire was discovered about 1 p.m., almost the identical time of day that the dormitory fire had occurred. Neither the origin of the fire nor the exact part of the barn in which it started was known. The north section of the hay mow was empty and the south section contained the alfalfa, and it was reported the fire started near the middle of the large barn. Station employees considered spontaneous combustion a likely cause. The barn was a large structure, 34 x 176 feet, originally built in 1916 with improvements and additions added during the intervening years. Emil Treischel, a station employee who was painting on the north side of the barn, was unaware of the fire until other employees had discovered it and turned in the alarm.

When Rodney Briggs became the fifth superintendent in 1959, there was some interest in establishing college level work on the West Central Campus.

A West Central Educational Development Association had been formed and worked in the 1959 legislature to secure funds for the venture. While the legislature did not appropriate any money, it did pass a resolution that the Board of Regents of the University of Minnesota should consider the establishment of college level courses at the school and experiment station. In November 1959 the Regents announced that they would run a pilot project at Morris and offer a year of college work to freshmen in the fall of 1960. No students were to be accepted in the School of Agriculture with the last class graduating in the spring of 1963. At this time Superintendent Briggs was requested to assume additional duties as acting dean of the new college, and he served in this capacity for 2 years until July 1, 1961, when the positions of dean and superintendent were separated. He chose to continue as dean of the University of Minnesota, Morris. Ralph E. Smith then became the sixth and present superintendent.

TRENDS OF THE WEATHER

According to the United States Weather Bureau, "The surrounding topography of Morris is a gently rolling till plain providing a fertile agricultural soil. The Pomme De Terre Valley, a tributary of the Minnesota River, provides drainage southward. Lakes north of Morris act as natural regulators of stream flow, so no flood problems exist. The location of Morris, near the center of the great land mass of North America, is the chief factor in determining its climate. The land mass, heating under a summer sun that shines for long hours at a high altitude, produces warm summers. With southerly winds bringing up moist air from the Gulf of Mexico, this is the season of greatest precipitation. Winters are in sharp contrast as the land cools rapidly, with less effective solar heating as the days are short and the sun is low on the horizon. Additional cooling is produced by prevailing northerly winds. But as the air contains small amounts of moisture, precipitation is light."

Climate at Morris

Weather records have been kept at Morris for a period of 79 years. On April 15, 1885, the late D. T. Wheaton, one of the pioneers of Morris, became interested in the weather, secured the necessary equipment, and became the first official weather observer for the United States Weather Bureau. The weather observations in this country previously had been under the supervision of the Army Signal Corps. Wheaton continued to take daily observations for a period of 34 years until August 31, 1919. The writer then took over the duties, serving until his retirement on July 1, 1956. Roy Thompson then became the official observer and has continued in that position to the present time. Morris has had continuous daily records of weather conditions for almost 80 years, one of the longest records in the state.

The weather has always been a favorite topic of conversation, but with the passing years, people seemed to have become more weather conscious, especially with respect to unusual conditions such as high or low temperatures, short or excessive amounts of precipitation, heavy snowfall or violent storms, etc.

Data accumulated over a long period of years indicate that within a particular area the average weather conditions such as temperature, rain, and snowfall do not change a great deal.

The average precipitation at Morris during the existence of the West Central Experiment Station is approximately 23.33 inches, 75 percent or about 17 inches occurring during the growing season - April through September. Annual amounts have ranged from as low as 15.31 inches in 1933 to 31.36 inches in 1957. The greatest amount recorded here was 33.03 inches in 1906. The greatest in only one month was 12.53 inches in June 1914. The longest consecutive period above normal precipitation was from 1911 to 1916. The most notable dry period was during 1931-1934, with a 17.50-inch average for those 4 years. Thunderstorms occur on an average of about 40 times a year; tornadoes are rare, only four being reported in Stevens County during the period 1916-1959.

The first measurable snowfall usually occurs in late October and the last in April. During the years of observation total snowfall has ranged from a low of 15.25 inches in 1949 to a high of 89.2 inches in 1951. March of that year had a record 46.5 inches. The average amount during the 53 years of the experiment station has been 37.95 inches.

Records also show that the greatest amount of moisture is recorded in June, the least in January; the coldest weather in February, hottest in July. The last spring frost occurs about May 10, the first frost of the fall in September.

The weather, of course, is sometimes unpredictable, and the unexpected occurs. Undoubtedly, the outstanding example of this was the summers of 1933 and 1934, the drought years. No other years on record can compare with these in detrimental effects on the general welfare of the country as a whole. A total of only 15.31 inches of moisture was recorded in 1933, the driest year on record--only 10.39 inches during the 5 months of the growing season. This might have been tolerated if not followed by a scant 15.87 inches in 1934 with a mere 8.93 inches registered from April through September. Few if any of the farmers who experienced it will forget the seared pastures and grain fields in 1934, the rolled leaves and withered stalks of corn, or the blistering temperatures during the summer with a maximum reading of 108.5 degrees on July 22. All have vivid recollections of skies darkened in midday by the terrifying dust storms. Corn and other cultivated crops perished. Pigeon grass was generally the best hay available, and even baled Russian thistles were reported to have sold for $10 per ton in certain areas. Ordinary straw stacks were worth their weight in gold. Neither will many of the farmers forget how they were compelled to dispose of all or at least part of their livestock, many of which were breeding animals and hard to replace.

Winter at Morris

The West Central Experiment Station wasn't spared either, harvesting little if anything in 1933 and experiencing a total crop failure in 1934. Pastures as well as all cultivated crops dried out. The hay crop was a failure, so it was not only necessary to buy feed grain to carry the stock through the winter, but several carloads of alfalfa hay were purchased from more fortunate western areas.

From the crop and livestock standpoint this was the most damaging period in weather history. In addition an immense amount of fine soil was literally sucked off the surface of the bare fields by the excessively high prevailing winds. Many roadside ditches were filled with irreplaceable top soil.

Seed grain, likewise, was scarce, and scores of growers were dependent upon the government for their seed grain stocks.

Blizzards are born in the prairie country and are rather frequent, but those imprinted in our minds are the Armistice Day blizzard of November 11, 1940, the March 15 storm of the following year, and the "blow" which occured on February 5-6, 1946. The Armistice Day storm came up rather suddenly toward evening. With winds estimated at 65 to 70 miles an hour whirling 8 to 10 inches of snow, traffic was soon paralyzed, power and telephone lines were broken, and houses thrown into darkness, many with insufficient fuel. Tragedy was mixed with humor. Many cars were practically lost from the snow cover. Home owners found sizable snow drifts that had been blown through tiny openings or louvres in their attics, as well as a generous supply in garages and other buildings. Livestock casualties were heavy because of the difficulty of getting them under cover. The toll of turkeys, many ready for market, was heavy with losses running into thousands of dollars. Many local duck hunters were caught unprepared and experienced some anxiety before reaching home.

Unlike this storm, the unseasonable blizzard which occured on March 15, 1941, had little snow for drifting, but housekeepers were busy for days removing the fine dust and dirt that had seeped into their houses through small cracks and crevices. But again Stevens County and this central part of the state were fortunate in escaping the greatest fury of the storm. The northern areas of the state suffered loss of lives and livestock and much damage to buildings.

The number three blizzard on February 5, 1946, started in the morning as light rain and snow with comparatively mild temperatures prevailing. As the day progressed, both the snow and wind increased in intensity and temperatures fell. By evening another howling blizzard was again stalling traffic and bringing misery to Morris and vicinity. The mild morning temperatures resulted in such a heavy covering of ice on power lines that a cable leading into Morris was broken during the evening, throwing the city and much of the surrounding area into darkness. Because of the difficulty of locating the break, all electrical equipment including cook stoves, refrigerators, and oil burning units were not functioning for about 36 hours. Fortunately, the temperatures were not below zero.

Morris and vicinity, including the experiment station, with an annual precipitation of only 23.50 inches, could almost qualify as a semiarid area. But approximately 15 to 17 inches are usually received during the growing season, so it rates as a very fine farming community. The greatest amount of moisture recorded during the existence of the West Central Experiment Station was in 1915 with a total of 32.38 inches (exceeded only by the 33.03 inches recorded in 1906 prior to the establishment of the station). June, with a 72-year average of 4.07 inches of rain, ranks as the wettest month of the year and also has the distinction of getting the most water in any one month, 12.53 inches recorded in 1914.

The coolest year on record was 1929 with an average daily temperature of 37.7 degrees or 6 degrees below normal. However, the longest sustained cold spell occurred the first 2 months of 1936 with 27 sub-zero days in January, 25 in February, a minimum temperature of 41 degrees below zero on February 16, and an average daily temperature of 5 degrees below zero for 2 months. The warmest year was 1931 with an average temperature of 47.7 degrees. The hottest day on record was 109 degrees on July 19, 1940.

PRECIPITATION BY YEARS
West Central Experiment Station

YEAR	Total Snow Inches	Total Prec. Inches	Prec. Apr.-Aug. Inches
1910	31.2	15.46	12.61
1911	41.9	28.23	17.42
1912	22.3	25.73	20.58
1913	23.6	25.67	20.05
1914	34.8	31.58	19.17
1915	31.0	32.38	20.05
1916	61.1	30.09	22.05
1917	70.0	19.13	10.99
1918	---	23.72	10.73
1919	---	22.21	14.85
1920	41.2	24.95	18.00
1921	29.0	24.06	13.12
1922	60.5	20.98	9.84
1923	64.5	20.45	12.05
1924	32.7	26.64	15.38
1925	29.0	21.60	13.75
1926	52.0	21.63	9.10
1927	49.0	21.78	11.65
1928	18.5	23.43	17.40
1929	37.25	23.94	13.57
1930	15.50	25.08	15.86
1931	27.20	19.22	11.01
1932	50.70	19.70	12.58
1933	18.00	15.31	10.29
1934	17.9	15.87	8.94
1935	22.6	27.68	22.91
1936	51.75	17.41	8.13
1937	61.25	26.54	18.65
1938	24.75	23.06	14.95
1939	32.50	21.70	15.61
1940	55.50	23.72	12.61
1941	19.95	25.61	16.89
1942	31.30	30.50	20.40
1943	53.50	25.95	17.86
1944	16.25	23.78	18.26
1945	52.50	19.94	12.64
1946	38.00	25.80	15.34
1947	39.25	19.02	12.36
1948	25.25	21.66	13.66
1949	15.25	21.43	14.69
1950	53.50	19.96	13.34
1951	89.20	23.37	16.24
1952	52.5	20.61	16.13
1953	40.0	25.07	18.25
1954	27.5	23.50	17.71
1955	54.5	24.31	19.30
1956	41.1	21.38	14.29
1957	29.5	31.36	21.19
1958	15.9	16.92	15.56
1959	20.1	17.99	15.76
1960	39.0	26.14	9.30
1961	27.9	16.98	10.32
1962	48.1	30.42	22.62
1963	36.4	26.30	17.60
1964	38.4	18.89	14.89

GREATEST PREC. BY MONTHS

Month	Amt-Inches	Yea
Jan.	2.32	192
Feb.	3.20	192
Mar.	2.62	192
Apr.	8.54	195
May	8.89	194
June	12.53	191
July	9.77	194
Aug.	6.58	193
Sept.	7.49	192
Oct.	4.12	194
Nov.	4.05	193
Dec.	1.81	192

	Inches	Yea
Greatest Prec.	32.38	191
Least Prec.	15.31	193
Greatest Snowfall	89.2	195
Least Snowfall	15.5	193
Greatest Prec. April - Aug. Incl.	22.91	193
Least Prec. April - Aug. Incl.	8.13	193
Annual Average Prec. 1910-1964	23.71	
Annual Average Snowfall 1910-1964	37.95	
Annual Average Prec. April - Aug. (1910-1964)	15.70	

POULTRY

The poultry department was organized at the West Central Experiment Station in 1914 to meet demands for classroom instruction at the school and to be of general assistance to poultry raisers in western Minnesota. During these early years the general management was in the hands of the animal husbandry department. On October 1, 1922, A. W. Edson joined the staff to take charge of poultry with plans for enlarging the department. A new laying house was built to accomodate 600 hens. A quote from the records states that "This house is of triple wall construction with a 4-inch air space between the inside and outside walls. The ceiling is 6 feet 6 inches from the foundation in front and 5 feet in the rear. There is space above the ceiling for the storage of sawdust or straw if either is necessary to maintain a dry, warm house. The building is 112 feet long and 16 feet wide with a feed room 16 x 16 feet in the center. The house is divided into six pens, each 16 feet square. These are separated by poultry netting. Each pen has a double window 59 x 54 inches. There are two ventilators for each window, one on each side and just below the level of the ceiling. These openings are 1 x 2 feet in size covered with a removable cloth screen on the outside and a sliding door to regulate the size of the opening on the inside. All interior fixtures are removable. The house faces south opening onto a 3-acre alfalfa field that will be used for range."

To begin, foundation stock of single comb white Leghorns and Barred Plymouth Rocks were selected from some of the best flocks of the Northwest. Trap nests were constructed, the plan being to trap nest each hen and keep accurate records so the station would be in a position to furnish breeding stock of known record production to poultry raisers of the west central area. Experimental projects were to be organized as the work progressed. Substantial growth was made in 2 years, and the new laying house was filled to capacity. Some students taking poultry courses helped care for these laying hens. The best record in 1924 was made by a white Leghorn hen No. 178 who laid 242 eggs that year. A Barred Rock No. 78 was second with 217 eggs.

Important additions to the department in 1925 were the 2,300 egg incubator and two colony chick houses. Poultry raisers, in addition to having access to breeding stock, now were able to buy chicks which came directly from known breeding production. The two new colony brooder houses made possible the raising of 500 pullets of about the same age for winter egg production and also doubled as winter laying houses for hens not laying heavily.

A pen of white Plymouth Rocks was added to the station flock during 1925. At that time seven white Leghorn hens had completed records of over 200 eggs while hen No. 210, the top layer, had 227. The following table, completed in 1925, gives the first comparative production record of the two breeds, Barred Rocks and white Leghorns. Final receipts favored the Leghorns by approximately 50 cents a bird.

October 1, 1924 70 Barred Plymouth Rocks		October 1, 1925 251 White Leghorns	
Total eggs	5,266	Total eggs	34,242
Total eggs per hen	75.2	Total eggs per hen	91.3
Lbs. grain per doz. eggs	15.8	Lbs. grain per doz. eggs	11.0
Value of eggs per hen	$2.13	Value of eggs per hen	$2.65
Value of meat per hen	.44	Value of meat per hen	.48
Total receipts per hen	$2.57	Total receipts per hen	$3.13

Three new poultry projects were organized in 1924 and were conducted over several years. The first was a project comparing the cost of production of single comb white Leghorns and Barred Plymouth Rocks, the object being to determine which of these breeds would return the most net profit considering the value of both meat and eggs produced. Typical birds of each strain were used in the experiment with accurate records kept of the following:

1. Cost of egg production.
2. Market value of eggs produced.
3. Market value of cockerels raised.
4. Cost of raising cockerels up to time of marketing.
5. Value of pullets raised.
6. Cost of raising pullets to age when egg production starts.

Project No. 2, begun in 1922, was a study of selection and breeding as factors in increasing egg production. The objects of this experiment were to determine what increase in production can be secured by breeding from birds of known production and to develop a high producing flock from which farmers might purchase breeding stock to improve their own flocks.

Method of procedure: Four pens of 20 birds each were used annually in the experiment. (1) One pen was mated with line bred birds from hens having records of 200 eggs or more. (2) One pen containing hens having records of less than 200 eggs was mated to a cockerel, the dam of which had a record of 200 eggs or more. (3) Two pens containing hens having records of less than 200 eggs were mated to males having excellent conformation but of unknown egg production.

Project No. 3, in cooperation with the veterinary division at the St. Paul Station, dealt with chick mortality caused by white diarrhea in the parent stock. All hens were tested for white diarrhea before being placed in the breeding pens. The breeding stock was tested each year and kept free from white diarrhea; consequently, little if any trouble was experienced from this disease. That this original purpose of the poultry department -- i. e., selling good breeding stock to the farmers -- was successful was indicated by the fact that during 1924, 51 breeding cockerels, 6,053 hatching eggs, and 300 baby chicks were sold from the station flock to farmers in west central Minnesota.

The laying house, 1922

All chicks raised in 1925 were self fed on a ration composed of 80 parts yellow corn, 20 parts middlings, 5 parts pearl grit, 5 parts bone meal, and $1\frac{1}{4}$ parts salt -- a ration that was recommended by the Wisconsin Agricultural Experiment Station. The chicks developed rapidly, and there was no loss from digestive troubles.

In 1929 the poultry department instituted a breeding program designed to improve and build up a high-producing, disease-free flock of white Leghorns. To assist in the actual work of carrying on these projects the station employed Art Schiller from Wisconsin. Highly-bred day old cockerels from some of the best stock available were purchased annually from the Ghostley's Poultry Farm at Anoka. Usually 200 birds were secured -- enough to insure fertile eggs for the year's hatching. Increased egg production was apparent almost from the start, and more money was made available for the project. The only cockerels purchased then were from hens having a 300 egg record or better. This method of improvement was continued from 1929 through 1959 when the poultry department was phased out.

In the meantime, other methods of procedure which were very instrumental in the improvement program were being used. I refer primarily to the steps taken to eliminate the disease commonly known as white diarrhea. It not only was very lethal to mature birds, but to young chicks as well. All birds showing symptoms were eliminated; no eggs known to have come from hens showing the symptoms were used for hatching.

A second area of consideration was the percentage of hatch, or the matter of ascertaining a hen's ability to lay a high percentage of fertile eggs during the hatching season. A standard of at least 90 percent was set, but occasionally reached a limit of 94 percent. The year-old hens were culled, keeping only the top birds based on their past records. By following this method, the average production of the entire flock of young birds would average from about 70 to 80 percent. A considerable number of these were usually kept over the second year, and by careful selection an average production equal to those of the young birds was maintained.

Following Anderson's resignation in 1945, Edson assumed the duties of horticulturist, and Clarence Hemming took charge of the poultry department, a position he held until the spring of 1946 when he also resigned. Schiller, with supervision from Fenske, carried on the work until October of 1946. H. G. Croom returned as a regular instructor in the School of Agriculture and was immediately assigned to take charge of the poultry department and the projects already underway. These and other projects mentioned later were conducted under Croom's supervision until the close of the school in 1961.

Croom instituted a feeding trial to determine "the most practical level that alfalfa could be used in a prepared laying mash." Starting the first year a 5-10-15 percent mixture was used and continued for 3 years; later a 7.5-12.5 and 17.5 percent mixture was used. Data secured from this trial indicated that alfalfa could be effectively used at the 15 percent level.

Another of Croom's innovations was a space trial, an attempt to determine the minimum space in which laying hens could be kept and still maintain satisfactory egg production. In the 3 years the space was reduced from 2.5 feet per bird to .6 feet which, of course, also decreased the feeding area. This crowded condition not only reduced the egg production materially, but resulted in so much cannibalism that drastic measures such as the use of goggles and debeaking had to be used in order to minimize casualties.

Entering the campus on April 1, 1929, was an individual destined to play an important role in the poultry department, Art Schiller. He was employed to handle the actual work of all poultry projects -- and a man more dedicated to his job would be difficult to find. From the start the chickens were his first concern, and he let nothing interfere with the job of caring for them properly. The 44-hour work week meant little if anything to him, nor did Sundays or holidays, so long as there was anything to be done. He preferred to work the extra time rather than trust less experienced help. In addition to his interest in poultry, he had his tree growing "hobby" -- the production of thousands of deciduous seedling trees. It paid off in terms of satisfaction, if not in money, as explained by the following item in the June 17, 1938, issue of the Morris Tribune.

"Planting of some 12,000 trees this spring in the new state park at the dam east of Morris and on the farm of the West Central School as the result of one man's hobby offers another indication of the unusual accomplishments that sometimes develop from hobbies.

"This particular hobby, the growing of trees from seed, is the possession of Arthur Schiller of the poultry department of the West Central Experiment Station, and from last year's plantings, Mr. Schiller now has hundreds of white oak, Bur oak, American elm, green ash, and honey locust seedlings. People interested in starting young trees will enjoy seeing his seedlings in the poultry yard at the school.

"Of the several thousand trees planted at the new lake and dam on the Pomme de Terre River, between 5,000 and 6,000 small green ash were donated by the West Central School from plantings made by Mr. Schiller."

Art retired in 1951 and was succeeded by Emil Treischel, who served as Croom's assistant until July 1, 1955, when Marshall Beebe assumed the responsibility until the department was phased out in 1960. After some 50 years this department ceased to be an integral part of the West Central Experiment Station.

HORTICULTURE

Prior to 1916 little systematic experimental work was attempted in horticulture. In 1917, however, a large number of ornamental shrubs were planted in and about the campus to secure information on hardiness, susceptibility to disease, foliage type, use for group plantings, and rapidity of growth. Large numbers of vegetable varieties also were grown and some data collected on yield, quality, and adaptation to the soil and weather conditions of the area. John A. Anderson, who became the first horticulturist in the fall of 1916, supervised and assisted with most of these plantings. Varietal tests of potatoes were instituted in 1918, and 2 years data were published in the 1919 station report of progress. During the next few years considerable experimental work was done on culture; "Ridged vs. Surface Cultivation" for potatoes is an example. Planting at various depths was started in 1919, as well as blight control by use of sprays. It is interesting to note that tubers planted at 3-inch depths produced the highest yields, while those put in at 5 inches showed the lowest.

Table 1. Yield per Acre of Potatoes in Depth of Planting Test

Depth	1919 Bu./A.	1920 Bu./A.	1921 Bu./A.	1922 Bu./A.	4-Yr. Average Bu./A.
2 inches	89.6	164.8	68.0	110.7	108.3
3 inches	99.9	170.2	87.3	110.7	117.0
4 inches	80.8	140.7	62.9	104.7	99.7
5 inches	79.9	120.9	60.4	88.6	87.9

Table 2. Yield of Potatoes With Ridged vs. Surface Cultivation

	1919	1920	1921	1922	4-year Average
Treatment	Bu.	Bu.	Bu.	Bu.	Bu.
Ridged	89.1	135.0	55.9	118.2	105.6
Surface	94.2	135.9	62.2	122.7	110.5

The following statement was made in the 1923 station report: "It is evident from the results obtained that ridging or hilling potatoes should not be practiced unless there is danger of water accumulating on the surface. Deep cultivation and ridging tend to dry out the soil and to prune the roots checking growth and resulting in smaller tubers."

Table 3. Potato Spraying Test With Bordeaux Mixture

	1919	1920	1921	1922	4 Year Average
	Bu./A.	Bu./A.	Bu./A.	Bu./A.	Bu./A.
Sprayed *	105.21	140.9	61.7	128.6	118.6
Not sprayed	93.93	132.3	55.8	118.7	106.4

* Average of three replications
Three applications of bordeaux

The comparative data on level vs. surface culture was all in favor of the level with a 4.5 bushel increase in 1922 and a 4-year average showing almost 5 bushels in favor of level cultivation.

Table 3 shows the results of spraying Early Ohio potatoes for blight with bordeaux mixture for a 2-year period, 1919 and 1920. The spraying was done on June 30, July 15, and August 1. On the whole, spraying with bordeaux resulted in a higher yield of larger and more mature potatoes. Four years average results were all in favor of spraying: increase in yields by about 12 bushels per acre and substantial reduction of the amount of nonmarketable tubers.

Potato Yield Trials

Variety testing trials were begun in 1918 with eight standard varieties selected to determine the most desirable strains for western Minnesota conditions. Tests were conducted continuously for 7 years. Seed potatoes were selected in the field and stored under the same conditions until the following spring, when they were given the same treatment before planting. Planting was in rows 3 1/3 feet apart with hills 18 inches apart in the row, and three replications were used. Seven years results are given in the following table.

Table 4. Yields Per Acre of Potatoes in Varietal Tests--1918-1924

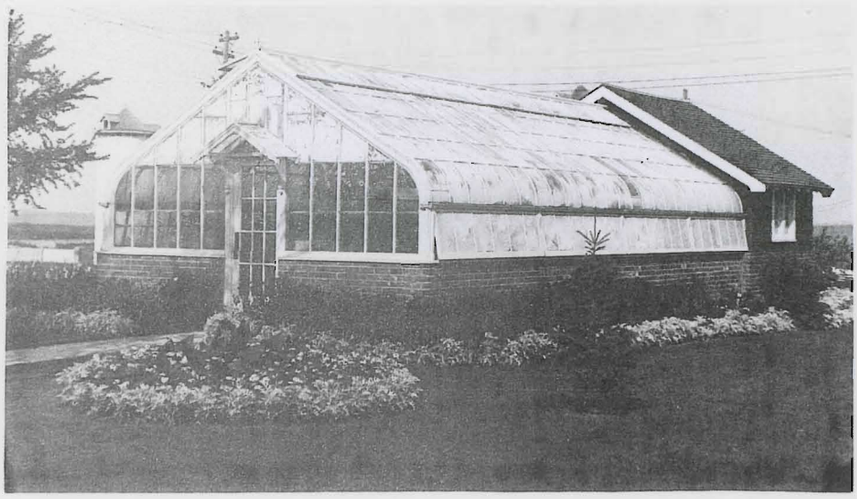
Variety	1918 Bu.	1919 Bu.	1920 Bu.	1921 Bu.	1922 Bu.	1923 Bu.	1924 Bu.	7-Yr. Av. Bu.
Green Mountain	146.2	70.6	198.2	40.6	135.6	117.3	283.5	141.7
Early Ohio	93.8	64.6	153.1	67.9	96.0	117.5	153.0	106.6
Bliss Triumph	72.5	38.0	109.1	28.1	96.5	83.1	102.2	75.6
Irish Cobbler	114.0	44.2	175.8	50.1	98.4	128.3	153.3	109.1
King	127.3	67.8	155.2	34.0	99.3	106.4	296.2	126.6
Burbank	90.7	61.9	131.5	52.4	---	143.3	243.2	120.5
Burbank Russet	112.5	60.0	135.6	53.4	101.6	124.3	252.5	119.9
Rural New Yorker	111.1	88.4	123.8	56.8	107.2	103.4	264.9	122.2

The data in table 4 show that Irish Cobbler was the top yielding early maturing variety, followed by Early Ohio. Green Mountain was the best of the late ones, ahead of King by some 15 bushels. While these data did provide some definite information for growers at the time, they are inserted here primarily as a historical record of the first potato experimental work done at the station almost 50 years ago.

Varietal tests of bush and tree fruits were begun for the first time in 1917 with some of the best commercial strains of gooseberries, currants, raspberries, plums, and apples. By 1922, there were 20 varieties of gooseberries, 6 of currants, and 9 of raspberries in the fruit garden. Many of these were selections taken from the fruit breeding farm at Zumbra Heights. These strains of fruit were grown with the idea of developing or discovering superior quality fruit, hardy enough to survive the vigorous climatic conditions of western Minnesota. Some outstanding strains mentioned at the time were "Carrie," a gooseberry with large fruit of fine quality, and "Pearl," which showed superior yielding ability. Currants, too, were getting a lot of attention. "Red Dutch" and "Perfection" varieties were standouts, vigorous and erect, as well as very productive.

The results of a test with Bordeaux mixture. Potatoes on the right were sprayed.

The original greenhouse at Morris was built in 1930.



This green ash windbreak was planted in 1930.

Among the bush fruits tested was one destined to become a legend among small fruit fanciers, a raspberry bearing the Minnesota No. 4, but later known as "Latham." It was described in the 1922 progress report as a "good producer, a vigorous grower, very hardy, and the most satisfactory." Other varieties showing considerable merit were "Sunbeam," "King," and "St. Regis."

Grapes also were put on trial in 1917, and 20 selections were obtained and planted, several of which were beginning to produce abundantly in 1922. No names had been given to them at this time, but No. 4-11 and 20 appeared to be the top yielders. Plums and Compass Cherries that had been planted as part of the original fruit trials had some fruit in 1921, but began bearing heavily in 1922. Those showing the most promise were DeSoto-Wolf, Forest Garden, Stoddard, and Supreme. Of the bush type, Hanska, Opata, and Sapa did exceptionally well in 1921.

Although a small orchard had been planted in the area just south of the present dairy barn, the first varietal tests of fruit trees began in 1918 when an orchard of 130 trees was planted. Included were 9 varieties of apples, 15 of plums, and 2 of cherries. More strains were added from time to time as they became available from the fruit breeding farms. This original orchard was located on rather high ground which sloped gently to the east. Protection was afforded on the north side by a heavy windbreak of elms, hawtrees, and poplars. Considerable protection was also afforded on the south and west by farm buildings. Trees in this orchard began bearing in 1924 with the varieties Duchess-Hibernal, Wealthy, and Peerless showing staisfactory yields for the size of the trees.

Another planting was made in 1921 in a more desirable location on land sloping toward the east and well protected from the wind, particularly on the west and south, by the station buildings.

This planting contained 93 trees, including 61 apple, 29 plum, 1 pear, and 2 ornamental crabs. All of these trees originated at the fruit breeding farm at the University of Minnesota. Only a few of the apple trees were bearing by 1924, but the plums, including the Compass Cherry, began bearing earlier. The plum crop was very good in 1923 and light in 1924, but in 1925 a frost during blossoming time caused a total loss. At this time the standard plums showing merit and greatest promise were the varieties Sapa and Opata, Wastesa, Forest Garden, Wolf, and Stoddard. Other varieties included were Anoka-Sumbra, Tonka, Winona, Monitor, Red Wing, Underwood, Elliot, Mound, La-Crescent, and several not yet named bearing only numbers. It is interesting to note that after 44 years, Underwood and La Crescent are still on Minnesota's list of recommended varieties. Because of certain conditions, however, little if any testing or research is being done on plums at present.

Further emphasis was given to tree fruit investigations in 1927, when Anderson established a new 10-acre experimental orchard of apples, pears, and plums on a plot of land directly south of the present heating plant adjacent to Second Street. While the land is rather rolling, there is a gradual slope toward the northeast, making it the most desirable location on the station for an orchard. Included among the plantings were a large number of the standard strains of apples such as Haralson, Wealthy, Hibernals, Malindas, Patten Greenings, Northwestern Greenings, Duchess, Red Wing, Minjon, Folwell, Erickson, Wedge and Prairie Spy along with three crabs: Yellow Transparent, Early Strawberry, and Whitney. Standard plums, including La Crescent, Mound, Elliot, Florence, Superior, Anoka, Tonka, Underwood, Waneta, and Red Wing, were planted in generous quantities, along with the lesser known varieties and experimental

lines. Mendel pears also were grown for the first time and later proved quite valuable. Considerable grafting was done during the early 1930's, topworking Hibernal stock with such strains as Wealthy, Malinda, Minnehaha, and Patten Greenings.

Various types of culture were tried during the early years, followed by use of legumes and grasses when erosion became rather serious. For a couple of years sheep were pastured in the orchard, but the practice was discontinued because of apparent damage to the trees. During the ensuing years valuable information was secured concerning hardiness of the trees, merits of the fruit itself, yield, and the most desirable culture.

Anderson resigned as horticulturist in 1945 and was succeeded by A. W. Edson, who held the position until July 1, 1947, when he was appointed superintendent. Wesley H. Gray, then a recent University graduate with a horticulture major, was appointed to the position and as this is written in 1965, is still on the job.

In the fall of 1918 when the writer arrived, very little ornamental planting had been done on the campus. It was quite bare of trees and shrubs. With the exception of a lilac hedge along the north side of the main entrance and a hedge of mixed shrubs on the south side, little if any landscaping had been done on the grounds. Some American elms, however, had been planted on each side of the street leading into the grounds and continuing up to the barns. There was a sidewalk from the main gate to the campus, but the street leading to and around the square was unpaved and became very muddy at times. It wasn't unusual to see a car having difficulty getting out of a mud hole. This situation was remedied in 1927 when a cement pavement with curb and gutters was laid from the gateway to the square and out to the barns. All the work was done by men who were regularly employed at the station. The grading and gravel was hauled by horse power; A. C. Heine, who was at that time in charge of the physical plant, ran all the levels and supervised the mix that was used. All aggregate came from the farm gravel pit and was used unwashed. The concrete was mixed on the spot and poured into the forms; the troweling was all done by hand. Despite these rather unorthodox procedures, the pavement has held up surprisingly well after almost 40 years of service.

The testing of trees and ornamental shrubs began to get serious consideration in 1918 following Anderson's appointment as horticulturist. A graduate of North Dakota State University, he came to the West Central School and Experiment Station in 1916 as instructor in music, but because of his training and experience soon assumed the horticulture duties. Extensive tests of various trees and ornamentals were begun, and large numbers of deciduous trees, evergreens, and ornamental shrubs were started in a nursery with two primary ideas in mind: to secure as much information as possible on the merits and adaptabilities of the various trees, and to provide the necessary stocks for landscaping the grounds. This procedure was particularly valuable from the standpoint of producing good evergreens. The lovely evergreen hedges of spruce, the beautiful Colorado blue and green spruce trees, and the stately Scotch and other long needle pines dotting the campus are all the results of Anderson's original nursery plantings. Only the best specimens were used.

A new greenhouse built in 1930 was a welcome and valuable addition to the horticultural department. It greatly simplified Anderson's work in producing annual flower seedlings for beautifying the campus and growing cut flowers for public and social affairs. While this greenhouse lacked many of the facilities of the more modern types, it did serve quite effectively for 20 years but was removed in 1950 to make room for the new addition to Agricultural Hall. A new

modern greenhouse was erected in 1955, built according to plans and specifications provided by Gray.

Under his supervision the work of this department has continued along similar lines, but with considerable expansion in other areas. New innovations include an experimental windbreak, a demonstration to determine growth rate of trees and shrubs being used in windbreaks, testing a large number of seedling apricots for adaptability to Minnesota climatic conditions, the establishment of an arboretum of trees and shrubs collected from widely divergent areas, and testing their adaptability for landscaping purposes under our climatic conditions. Wildlife cover materials have now been incorporated into this work and several areas set aside to be developed as wildlife shelter areas.

An enlarged program of vegetable varietal testing was begun in 1949 and is being continued to find varieties of vegetable plants that can withstand hot, droughty conditions and still produce a satisfactory crop. Under Gray's supervision extensive apple grafting studies were begun in 1959. The purpose was to grow less hardy varieties that have good culinary or dessert qualities by grafting them onto hardy root stock materials and eliminating the most frequent source of winter injury.

With the advent and establishment of the new University of Minnesota, Morris, Gray continues to have supervision of all the landscaping and maintenance of the campus.

ANIMAL HUSBANDRY

Some animal husbandry work had been started in 1915, in dairy and beef production. The first project attempted was the grading up of a common herd through the use of a purebred Guernsey sire. A little later some purebred stock was purchased, and by 1916 the station herd consisted of eight purebred Holstein Friesians, five Guernseys, six Shorthorns, four Polled Angus, and seven grade animals. Some selection work also had been done with Duroc Jersey hogs. During 1916 the Animal Husbandry Department was strengthened by the addition of eight purebred and six grade Shropshire sheep and a Percheron stallion.

The work in 1916 apparently centered on a continuation of the founding of purebred herds and the eradication of contagious abortion as a means of laying the foundation for future experimental work in livestock production.

When the work could be done on a normal basis, it was the policy of the station to maintain only one breeding herd of dairy cattle and one of beef. At that time the dairy herd consisted of 16 Holsteins and 14 purebred and grade Guernseys. Sixteen purebred Shorthorns and three purebred Angus made up the herd of beef cattle. Contagious abortion continued to plague the department during 1916, but effective measures were used to reduce the disease. By 1917 there were only two cases, both heifers with first calf. No experimental work was attempted in 1918. The shortage of help due to the First World War as well as the high cost of feed made it advisable to discontinue all projects until after the war.

The first authentic record of any experimental work with swine was a series of feeding trials set up in 1915 and carried out during 1916 and 1917. Entitled "Feeding Experiments with Swine," its purpose was to determine the value of alfalfa as a pasture for swine. The following subprojects were begun in 1916:

Subproject I - Growing pigs on alfalfa pasture in combination with the self feeder as compared with growing pigs in a dry lot in combination with the self feeder.

Subproject II - Growing pigs on alfalfa pasture in combination with a full grain ration (hand fed) as compared with growing pigs in a dry lot in combination with a full grain ration (hand fed).

Subproject III - Growing pigs on alfalfa pasture in combination with a full grain ration (hand fed) as compared with growing pigs on alfalfa pasture in combination with a reduced grain ration (hand fed).

Subproject IV - Growing pigs in a dry lot in combination with the self feeder as compared with growing pigs in a dry lot in combination with a full grain ration (hand fed).

Subproject V - The effect of pasturing hogs on the growth and stand of alfalfa.

The following data show results of the swine feeding trial for 1917.

Results of Feeding Experiment - 1917

	Hand Fed Dry Lot	Self feeder Dry Lot	Self feeder Alfalfa Pasture	Hand Fed Alfalfa Pasture
Initial weight - pounds	36.37	37.15	37.08	37.46
Final weight - pounds	166.57	164.46	178.68	173.26
Average gain per day per pig	1.26	1.23	1.35	1.31
Total gain per pig - pounds	130.2	127.31	139.6	135.8
Total grain consumed per pig - pounds	533.3	538.5	546.86	543.0
Average daily grain consumed - pounds	5.17	5.22	5.39	5.27
Grain used per pound pork	4.09	4.22	3.98	4.02
Cost grain, 100 pounds pork	11.04	10.97	10.46	10.85
Profit per pig (over grain cost)	6.78	6.72	8.08	7.19
Percentage barley in ration	70.0	66.99	76.33	70.0
Percentage flour middlings	20.0	26.61	19.87	20.0
Percentage tankage in ration	10.0	6.4	3.8	10.0
Cost mixed grain per lb. (cts)	2.7	2.63	2.6	2.7

Selling price hogs $ 16.25 Net
Days of feeding 103
Price of feeds
Barley 1.25 per bushel
Fl. Middlings 48.00 per ton
Tankage 80.00 per ton

While work in swine production was carried on in 1916 and 1917, the abnormal conditions prevailing during the First World War made it advisable to discontinue this work in 1918 and 1919. However, the herds and flocks which were being maintained as demonstration breeding herds and for class work showed material improvement.

During 1916 a flock of eight purebreds and six grade Shropshire sheep were purchased and added to the livestock, although suitable quarters were not available for any project work. The 13 ewes, however, made a creditable record by dropping 22 lambs, of which 21 were raised--an increase of 161 percent--and the flock averaged a 10-pound wool clip. The ewes wintered on alfalfa hay, and no grain was fed with the exception of half a pound a day for 3 weeks at lambing time.

The impressive record induced a statement from the station to the effect that west central Minnesota was adapted for sheep raising. "While the results obtained this year may be above the average, still it is readily seen that the margin above the cost of production is wide enough to insure a good profit and more of the farmers would do well to add a small flock of sheep to the livestock of their farms."

Some trouble was experienced with the swine in 1919. Among the spring litters there were a great many hairless pigs. Approximately 75 percent of the litters were affected, some being all hairless, others only partly so. They were of normal weight and size with some above normal weight. When absolutely hairless and born alive, they always died within a short time. They were characterized by thick pulpy necks, thick skin, no squeal, and no vitality. At this

time the veterinary profession was not fully agreed as to the cause of the malady, but evidence from other stations and states indicated the cause as "goiter," an enlarged improperly working thyroid gland. Treatment with iodine during the gestation period was recommended and apparently seemed good insurance against a recurrence of the disease.

The use of barley as a hog feed was given considerable attention especially with the advent of prohibition. It seemed this staple crop could most profitably be used in feeding livestock, more specifically hogs. At the West Central Station barley formed a large part of the ration for hogs the year round and seemed to be an excellent substitute for corn. While deficient in protein when fed alone, shorts or tankage or both could be used as supplements.

That cheap gains can be made when barley forms a major portion of the ration for hogs is shown by the following work with pigs as self feeders. One lot on self feeders and alfalfa pasture produced a pound of gain on 3.98 pounds of grain. The ration as selected by the pigs consisted of 76.33 percent barley, 19.87 percent flour middlings, and 3.8 percent tankage. A second lot of pigs in a dry lot made a pound of gain on 4.22 pounds of grain. The ration as selected consisted of 67 percent barley, 26.6 percent flour middlings, and 6.4 percent tankage. It was shown that very satisfactory results may be obtained with barley in feeding hogs; the lack of corn need be no drawback to profitable pork production.

Hog Feeding Trials in 1921

Comparing:

1. Corn alone vs. corn and tankage on rape pasture.
2. Corn and tankage vs. barley and tankage on rape pasture.
3. Corn and tankage in a dry lot.
4. Corn and rape pasture.
5. Corn, tankage, and blue grass pasture.

The following data are submitted only to illustrate some of the earliest hog feeding trials at the West Central Experiment Station.

Hog Feeding Trials in 1921

	Corn Tankage Rape Pasture	Corn and Rape Pasture	Barley Tankage Rape Pasture	Corn Tankage & Dry Lot	Corn Tankage Blue Grass Pasture
Initial weight - pounds	50.06	51.58	51.36	50.68	52.20
Final weight - pounds	167.39	98.09	161.52	161.24	175.50
Total gain - pounds	117.33	46.51	110.16	110.58	123.30
Average gain per day - pounds	1.31	0.52	1.23	1.24	1.38
Corn required per pound of gain - pounds	3.00	4.78	----	2.77	2.81
Barley required per pound of gain - pounds	----	----	3.64	----	----
Tankage required per pound of gain - pounds	0.33	----	0.47	0.61	0.41
Total concentrates per pound of gain - pounds	3.33	4.78	4.11	3.37	3.22

Hog Feeding Trials in 1921 (continued)

	Corn Tankage Rape Pasture	Corn and Rape Pasture	Barley Tankage Rape Pasture	Corn Tankage & Dry Lot	Corn Tankage Blue Grass Pasture
Percent of tankage used	10.01	----	11.40	21.80	12.70
Cost of feed per 100 pounds of gain	$ 4.17	$ 4.78	$ 5.29	$ 4.89	$ 4.24
Profit per 100 pounds of pork @7.00/cwt.	$ 2.83	$ 2.22	$ 1.71	$ 2.13	$ 2.75

Feeding period - 89 days
Tankage - $70.00 per ton
Corn - 56¢ per bushel
Barley - 48¢ per bushel
One pound tankage replaced 5.32 pounds of corn.
Selling price - $7.00 per cwt.
Ten Duroc pigs per lot.

During the first 10 years that the station was in operation it was a policy and objective to build up good representative herds of dairy cattle, beef, sheep, and swine. Considerable progress was made, a gradual but positive improvement. By 1922 these classes of livestock showed quite a high degree of excellence and uniformity. The use of the best sires obtainable was possibly the reason for the improvement. Breeds represented were Scotch Shorthorns, Holsteins, Shropshire sheep, and Duroc Jersey hogs. These breeds were selected primarily because they were more prevalent throughout western Minnesota than many other breeds. During this year the herds were improved by the purchase of three Holstein heifers of excellent breeding and two very good Shorthorn heifers. Both additions tended to improve materially the quality and uniformity of these breeds.

In 1921 official testing of the dairy herd was made a definite policy of the department. Semi-official 10-month and yearly tests were the first made, although an occassional 7-day official test was made in special cases. One 7-day test and two yearly tests were completed in 1921 with the following results:

Seven Day Test

Name of Cow	Pounds Milk	Pounds Butterfat	Pounds Butter
Nockdair Pontiac Burke Segis (Holstein) (Age - 7 years)	547.9	18.676	23.39

Yearly Test

Flora of La Villa (Guernsey) (Age - 7 years)	8,775.0	430.0	505.1 85% fat
Mercedes Nachefe Segis Dekol (Holstein) (Age - 2 years, 2 months, 5 days)	12,020.0	384.5	480.6 80% fat

By 1924 the Animal Husbandry Department was equipped with modern barns, and the herds had been improved and were creditable. At this time the main objective was to furnish suitable material for instructional work in the school's animal husbandry courses and for object lessons for farmers visiting the station. Many hundreds had taken advantage of the opportunity. It was the policy to make the herds largely of the station's own breeding through the use of good sires. By exchanging sires with other branches of the University, it was possible to utilize superior animals at a considerable saving in cost. Very few females had been purchased since the establishment of the herds.

The dairy herd, mostly purebred Holsteins, was handled on a practical farm basis, with alfalfa hay grown on the farm and corn silage as the basis of their ration. In addition the young stock received a light mixed grain ration. All stock were on pasture during the summer except for young animals under 6 months of age.

The purebred bull calves were grown out and sold for breeding purposes, but the heifers were retained in the herd as replacements for the undesirable ones. A mechanical milker was used and cows milked twice daily, except for those on semi-official test which were milked three times. The following records indicate some progress made in production.

Records of Cows Having Completed Lactation Periods - 1923-24

Cow	Breed	Age	Days Milked	Pounds Milk	Pounds Fat	Pounds Butter
Nockdair	H	9	365	19,306.9	597.16	746.4
Mercedes 1st. *	H	9	305	14,858.9	522.33	652.9
Helena 1st.	H	12	314	8,205.8	234.26	292.8
Helena Ormsby*	H	2	365	10,555.2	334.33	417.9
Helena Lolantha*	H	2	365	13,810.9	452.12	565.1
Mary Ann	H	2	365	8,364.6	266.91	333.6
Wadella	H	9	302	12,129.0	448.11	560.1
Star	H	3	365	10,435.5	374.29	467.8
Lady 2nd. *	H	7	365	17,717.0	559.18	698.9
Polly 1st.	G.G.	13	328	8,310.6	342.21	427.7
Johanna	G.H.	4	365	8,486.4	296.75	370.9
Ella 3rd.	G.G.	5	288	3,763.6	207.86	259.8
Polly 3rd.	G.H.	3	254	3,502.1	195.01	243.7

Average number days in milk - 334
Average milk production, pounds - 10,728.00
Average fat production, pounds - 371.58
Average butter production, pounds - 464.40
*Semiofficial Records

As of July 1, 1925, an inventory of herds and flocks showed a total of 60 head of cattle, 27 beef and 33 dairy; 169 hogs; and 81 sheep. The demand from farmers for breeding stock had been strong. During the year, 9 purebred boars, 5 purebred sows, 10 purebred rams, and 5 purebred bulls had been sold; of the boars and rams, the demand exceeded the supply. The dairy herd was made up largely of Holsteins and in 1925 contained a large proportion of young stock. It was the desire of the station to increase the number of milking cows as rapidly as possible to be accompanied by the development of heifers from the herd. A fine herd of Scotch Shorthorns had been developed, all except three

having been bred at the West Central Station. The flock of Shropshire sheep was maintained primarily to supply classroom material and an incentive for farmers to grow more sheep. High prices for sheep and wool during the past 3 years, 1923 to 1925, had greatly stimulated the interest. Twenty-three Duroc sows farrowed and raised 145 pigs in 1925, nine of the best boars being saved and sold for breeding purposes and the superior gilts reserved for increasing the supply of the station.

During the ensuing years it was the policy of the Animal Husbandry Department to promote dairy herd improvement by good feeding and management and the use of the best sires that could be obtained. By 1933 the station's 18 Holstein cows had made a herd average of 340 pounds of butterfat, or approximately 140 pounds over the state average, but to Jordan, the animal husbandman at the time, it was still unsatisfactory. His objective was to build up the genetic ability of the cows to produce more milk through the use of better bulls. Fortunately, he was able to obtain "Johanna Lunde Ormsby Sensation," the old herd bull from the Winship herd at Owatonna, who was about to be disposed of for "baloney." This deal turned out well; his daughters increased the production of butter fat by 57 pounds over the herd average before he was put out of service. Then, in succession, two bulls were purchased from the Central Station at St. Paul. "Minnehaha Burke Dorrit" and "Minnehaha Matador Drina Lad." The latter proved to be the most satisfactory, his first 26 daughters showing a substantial increase in pounds of butterfat as compared to their dams. It is well to bear in mind that at this time the primary objective was a high level of milk and butterfat production, and these individuals had averaged 494 pounds of butterfat on their latest test.

Further improvement would require the services of a most exceptional sire. After long and careful consideration of many animals, Jordan in 1938 decided upon and obtained "Femco Deluxe" from the Femco Farms of Breckenridge, Minnesota. This bull more than lived up to all expectations, and his first nine daughters averaged 601 pounds of butterfat as compared to their dam's average of 537. This sire eventually was given a "Gold Medal" rating by the Holstein Friesan Association of America, the first bull from Minnesota to receive such a rating. It was decided to use some of his offspring in the herd, and eventually four of his sons were utilized as herd sires.

Scotch Shorthorn cows, 1931

This meant a program of inbreeding, but in addition to Femco Deluxe and his sons, a number of unrelated sires were purchased and used during the same period, three by artificial insemination. The situation eventually proved a worthwhile experiment for evaluating the relative merits of inbreeding and out crossing with all animals receiving the same treatment.

During the early history of the herd, prior to any inbreeding program, no production records were recorded. In 1936, however, the herd was placed on the official Herd Improvement Registry Test, a system that has been in effect to the present time.

Progress being made with the herd of the West Central Station was further demonstrated in April 1945 when the Minnesota State Holstein Breeders Association of Owatonna presented Jordan a plaque from the Holstein-Friesian Association of America in recognition of the work done at the station in dairy herd improvement. The Morris Station was given the Progressive Breeders Registry Award in recognition of achievement through an improved breeding program based on production, testing, type classification, and herd health. Only two other such awards had been made previously to Minnesota breeders. In commenting on the award it was said that "every cow in the West Central Station herd was born and raised there, as were their mothers and grandmothers. The herd now has an 8-year average fat record of over 400 pounds of butterfat on twice a day milking, the highest single year average being in 1943 when the splendid record of 457.5 pounds of fat average was attained on 24 cows, 10 of which were less than 3 years of age at the start of their records." Four cows in the herd had exceeded the 600-pound fat mark, the highest being "Della Ormsby Burke Dorrit" with 677 pounds of fat to her credit on twice a day milking. The splendid achievement of the station herd marks it as one of the outstanding Holstein herds in Minnesota.

In July 1950 the milking barn was partially destroyed by fire, the inconvenience incurred no doubt affecting production records of the herd animals to some extent.

Jordan died early in 1956 after a tenure of 40 years. On July 1 of the same year he was succeeded by Harley Hanke, who at this writing is still head of the Animal Husbandry Department.

During Hanke's regime a considerable amount of research has been conducted with the dairy herd as part of the Cooperative Regional Project N. C. 2, titled "Improvement of Dairy Cattle by Breeding." Chief among the projects are:

1. The milking interval experiment.
2. A trial involving the synchronization of estrus in bovines in an attempt to develop a method of bringing a number of cows of a given herd into production at the same time.
3. Solids-not-fat study as well as butter determination.
4. A study conducted in recent years on udder palpation of heifer calves to determine their ultimate production as mature animals.

During all this time the herd has been experimental, and at frequent intervals the butterfat production has dropped as a result of the side effects of experiments conducted. But despite these side effects, the production record of the milking herd of Holsteins has continued to be outstanding and in 1964 was rated one of the top herds in Minnesota. The University of Minnesota Breeding Projects Newsletter for September-October 1964 stated that "the September

DHIA report shows Morris with a 12-month herd average of 14,565 pounds of milk and 568 pounds of fat for a herd of 48 cows." This milk fat mark exceeds the previous high for an experiment station Holstein herd set by Crookston at 563 pounds in January 1963.

Finally, it seems appropriate to give credit to two of the outstanding animals. Volume 20 of the "Holstein Friesian Type and Production Yearbook" lists two Holstein cows that produced over 150,000 pounds of milk during their lifetime at the West Central Experiment Station at Morris. The two cows given recognition with their records are as follows:

Name and Registration Number	Days From 2 Years	Milk Pounds	%	Fat Pounds
Agmore Dekol Sally Supreme No. 3143998	4,150	163,610	3.4	5,556
Agmore Mary Burke Supreme No. 3194810	3,753	155,534	3.6	5,648

Sally, who was 13 years and 4 months old, averaged 39.4 pounds per day for every day of her life after 2 years of age. Mary Burke, whose age was 12 years and 3 months, averaged 41.4 pounds per day on the same basis.

In 1937 the West Central Station began a cooperative project with Swine Breeding Laboratory. The late L. M. Winters served as a leader of a project titled "Selection Inbreeding and Crossing for Swine Improvement." This was the original work in crossbreeding swine done by the University and now practiced by a large percentage of the swine producers of the country.

The first result of this program was the development and production of the Minnesota No. 1 hog, which became a popular type with many growers at the time. Continuous breeding trials during ensuing years resulted in the development of the Minnesota Nos. 2, 3, and 4 hogs with the West Central Station actively participating in the development. It was thought that these three breeds contained a greater genetic diversity than the popular breeds of the time and that the market pigs resulting from crossing the inbred lines exhibited greater hybrid vigor. In Extension Bulletin No. 180, June 1943, by Winters, Kiser, Jordan, and Peters, it was reported that "Possibilities in crossbreeding swine for market were carefully tested experimentally for 6 years. Three types of crossbreeds were produced, i.e., first cross, three-bred cross, and back cross. All were superior to the purebreds but the three-bred cross possessed the greatest advantage. Also, that crossbred sows proved superior to purebreds for producing market pigs and crossbred advantages of most concern to the commercial swine producers are the greater litter size and weight at weaning, the shorter time to reach market weight, and the decreased feed necessary for a pound of gain."

At present breeding centers around the selection of inbred lines, emphasizing particularly litter size, growth rate, and feed efficiency. The project title now is "Systems of Breeding for the Improvement of Swine by Inbreeding."

It is still part of the swine breeding project carried on by 10 cooperating states under the supervision of the United States Department of Agriculture.

The original dairy barn, 1910

Femco DeLux, the herd bull, was 20 months old when his picture was taken in 1938.

These Early Columbias and crossbred ewes were part of the station's first sheep flock.

Before the development of the inbred lines, Black Poland China were used by the West Central Station, which cooperated with the Central Station at St. Paul on a longtime study of crossbreeding swine. The possibilities of breeding in this manner were carefully tested experimentally for 6 years with results published in Bulletin No. 180.

At the time Hanke assumed the responsibilites for this department, Minnesota No. 2 and San Pierre (Berkshire x Chester White Cross) breeds were being used. Later No. 3 and 4 lines were used and the San Pierre dropped. During the past few years about 100 sows have been kept for breeding purposes each year. Because of physical limitations of swine facilities, these sows are farrowed in groups of approximately 25. Three-fourths of the pigs are used in breeding studies, the remainder for swine nutrition trials. In the post World War II period, 1946 - 1959, large numbers of surplus boars from the inbreeding projects were made available and sold to area producers. In more recent years with the development of the new Minnesota Swine Evaluation Stations at New Ulm and Austin, the meat type characteristics of the purebreds have been appreciably improved, and commercial swine producers have returned to the purebred swine breeders for the source of their breeding stock. However, the testing program followed by the University experiment stations emphasized the importance and desirability of performance testing. Its acceptability by commercial producers and the demand for production tested hogs encouraged purebred breeders to upgrade testing standards.

Fattening Western Lambs

In 1926 the West Central Experiment Station, in cooperation with the Division of Animal Husbandry of the Central Station at St. Paul, began a series of lamb feeding experiments. The purpose was to acquire information of value to farmers in the west central part of Minnesota regarding the possibilites of purchasing thin sheep and lambs from western ranges during late summer or early fall, feeding them primarily on home grown feeds, and then marketing them as fat sheep or fat lambs. It was proposed to continue the study 3 to 5 years. Because of the historical significance of the first trial, a brief summary is given below. The lambs were white-faced having a Merino foundation with a coarse wool cross. They were received October 3, 1926, and until the beginning of the experiment grazed on pastures and stubble fields and were fed a little hay and grain. This first lamb feeding trial began October 26, 1926, and concluded December 28, during which time 240 lambs were fed for 63 days in eight different lots as follows, 30 lambs per lot. Three lambs, one each from Lots 2, 6, and 7, died.

Rations Fed

Lot I	Ear corn and alfalfa hay
Lot II	Ear corn, alfalfa hay, and oil meal
Lot III	Shelled corn and alfalfa hay
Lot IV	Shelled corn, alfalfa hay, and oil meal
Lot V	Ground barley and alfalfa hay
Lot VI	Ground barley, and alfalfa hay, and oil meal
Lot VII	Ground barley and sweet clover hay
Lot VIII	Ground barley, sweet clover hay, and oil meal.

All lots receiving oil meal were fed 0.2 pound per head daily. All were given a full feed of hay and grain, consuming approximately 1 pound of hay and 2 pounds of grain daily. All were continually supplied with salt and water and were housed in a shed where they were well protected from the weather and had access to an outside yard.

Feeds and Gains For Eight Lots of Lambs
October 26 - December 28, 1926--63 days

Lot No.	1	2	3	4	5	6	7	8
Ration	Ear Corn Alfalfa Hay	Ear Corn Alf. Hay Oil Meal	Shelled Corn Alf. Hay	Sh. Corn Alf. Hay Oil Meal	Ground Barley Alf. Hay	Gr. Bar. Alf. Hay Oil Meal	Gr. Bar. Sweet Clover Hay	Gr. Bar. S.C. Hay Oil Meal
Average								
Initial weight	71.4	70.6	70.7	71.0	70.6	70.8	70.8	70.5
Daily gain - pounds	0.33	0.39	0.36	0.42	0.30	0.34	0.32	0.35
Total gain - pounds	20.7	24.6	22.6	26.5	18.9	21.5	19.9	22.3
Final weight - pounds	92.1	95.2	93.3	97.5	89.5	92.3	90.7	92.8
Feed for 100 pounds gain								
Ear corn - pounds	480.5	402.8						
Shelled corn - pounds			434.5	378.6				
Ground barley - pounds					546.8	467.9	521.5	440.3
Oil meal - pounds		51.4		47.4		58.5		56.4
Alfalfa hay - pounds	421.2	355.7	367.2	320.2	460.6	400.9		
Sweet clover hay - pounds							455.6	405.5
Cost per 100 pounds gain	$8.73	$8.62	$8.18	$8.31	$9.36	$9.52	$7.91	$8.19

Feed prices:
Ear corn - 65¢ per bushel
Shelled corn - 70¢ per bushel
Barley - 50¢ per bushel
Alfalfa hay - $15 per ton
Sweet clover hay - $10 per ton
Oil meal - $50 per ton
Cost of grinding - 8¢ per cwt.

The results indicated that:

1. Both ear corn and shelled corn, when fed with alfalfa hay, made more rapid daily gains than barley and alfalfa and produced gains more cheaply.
2. Oil meal increased the rate of gain.
3. Shelled corn proved somewhat better than ear corn in rate of gain and cheaper gains.
4. Sweet clover with barley resulted in slightly greater gains and reduced the cost.

The initial price of the lambs at $10 per cwt. was $7.08, F.O.B., Drummond, Montana, which with other charges, freight, selling, feed, interest, etc., brought the cost per lamb to $10.43. The selling price of 237 arrivals averaged $10.80, leaving a net return of 37¢ per lamb. It is of interest to note that top lambs were selling at $12.50 per cwt.; 213 of them sold at $12. and 24 at $10 the lower price because they were not fat enough.

The Morris Tribune of January 7, 1927, stated that "The first Sheep Feeders Day at the Morris Experiment Station held on January 3, 1927, was attended by several hundred enthusiastic farmers and feeders. It was the first meeting of its kind held in the state and attracted farmers from long distances. The big feature of the day was the viewing of eight lots of Western lambs that had been fed various types of rations for the preceding 2 months. Professor P.S. Jordan, who had been in direct charge of the experiment, gave the figures on gain and cost of same. In this, the first experiment of its kind, the lambs that were fed a ration of shelled corn, alfalfa hay, and oil meal made the greatest gain. Corn proved superior to barley in rate of gains and lowered cost of gains, averaging $8.18 per cwt., while ground barley and alfalfa hay resulted in a cost of $9.36 per cwt. Oil meal with alfalfa increased the rate of gain but slightly increased the costs. It was interesting to note that a good quality sweet clover hay was equal to alfalfa in making gains."

At the close of the morning program a lamb dinner was served to over 200 farmers in the school dining hall. At each of the 36 succeeding Lamb Feeders Day Programs it has been the custom to serve a lamb dinner.

During these early feeding trials with lambs, a second test usually was run to check on the results of the first trial. Five lots were fed on similar rations, and results checked out closely with the first test. The protein supplement to corn and alfalfa gave a more rapid gain, but little if any difference resulted from

the use of oil meal or from cotton seed meal. Whole barley appeared preferable to ground barley. The Third Annual Sheep Feeders Day was held on January 11, 1929, with data on 240 Western lambs showing conclusively that it was not advisable to grind grain for feeding lambs and that barley was about equal to corn in a lamb ration. This bunch of lambs sold on the St. Paul Market for $16.10 per cwt., netting the station $1,000 above all costs.

The purpose of the fourth annual sheep feeding trials was to determine the value of oats fed alone or in combination with other grains as a feed for fattening lambs. It failed, however, to make as favorable a showing as either corn or barley. It failed to make as large or as cheap gains, and it didn't put as desirable a finish on the lambs as did corn or barley.

Despite a statement make in 1926 that "It is proposed to continue this feeding trial study for from 3 to 5 years," the project continued to gain momentum and attract interest all over the midwest, including the states of North and South Dakota and into Montana. As the years progressed many of the so called 'large feeders' were induced to participate in the speaking programs, offering many practical as well as theoretical ideas. All attendance records were broken at the 14th annual program on January 13, 1940, when over 500 lamb feeders were registered. The feeding trial that year centered around self-feeding fattening lambs with the particular purpose of getting definite information on how much dilution corn needs for safe feeding. Again the program was well balanced by such practical feeders as Guy Flint of Elbow Lake and Ed Merrill and Paul Cunningham of Pipestone--all substantial feeders and each supplying valuable information from experience.

In recent lamb feeding trials emphasis has been placed on the testing of hormones, antibiotics, pelleted feeds, pasture feeding, sources of proteins, tranquilizers, iron injections, cobalt bullets, and the various vitamins, enzymes, and thyroid alterations. Because pertinent information has been provided for the farm flock producer as well as the feeder, the results of these trials are now reported on "Sheep and Lamb Feeders Day." This continues to be one of the most popular programs of the West Central Experiment Station with a record crowd of 550 registered for the 1958 event.

The results of these feeding trials have been widely accepted by lamb feeders of the Northwest. All lamb feeding work done by the University of Minnesota has been done at the West Central Experiment Station.

Prior to 1964 the sheep flock at the station was used as a part of the regional sheep breeding project, now discontinued. The flock is being used in a farm flock management problems study titled "Nutrition and Management Programs for Ewes on a Year-Around Basis." The ewe flock consists of 100 head of purebred Columbias.

Beef

The original beef cattle herd was composed of 16 purebred Shorthorns and three purebred Angus. In 1925 there were 27 beef animals, all Shorthorns. With the three exceptions all the animals were bred at the station. Because of limited facilities, the number of animals was kept at about this level for several years. They were of straight Scotch breeding, bred up to quite a high degree of perfection, and at the time furnished a source of seed stock of highest quality. It was the policy in managing the herd to carry the breeding cows as economically as possible, but to have them carry sufficient flesh to make suitable class-

room judging material in the School of Agriculture. Young stock was fed liberally. As the young heifers came on, they were placed in the herd and the older, less desirable cows removed. With the more favorable position of beef on the markets, there was increased interest in beef cattle among farmers and demand for desirable young bulls.

High awards for animals shown at the 1923 International Livestock Show in Chicago indicated that definite progress was being made in the improvement of the beef herd of the West Central Experiment Station. An item appearing in the Morris Tribune for December 14, 1923, commented as follows on the winnings:

"The West Central Experiment Station is being congratulated for the splendid record which their entries made at the International Livestock Exposition in Chicago. Among the winnings was included one of the highest awards of the entire show, that of Champion Crossbred Shorthorn Steer, which was bred at the West Central Experiment Station. The dam was a purebred Angus cow and the sire a Shorthorn bull, "Masterpiece," who headed the herd one year ago. In addition to winning the first premium in two different classes, the Rex Steer was awarded the Reserve Championship in the crossbred and grade steer classes for the entire show. It was also pronounced by many judges as one of the finest entries in the fat steer class that had been exhibited in recent years."

Another first was recorded by the station in 1931 when "Hercules Golden Gift," herd bull at the West Central Station, was named the Grand Champion Shorthorn bull at the Minnesota State Fair. In 1933 the Grand Championship on Shorthorn females was won by the University of Minnesota on Maybloom 21st, a daughter of "Hercules Golden Gift," the third successive year that this great Shorthorn female had been awarded the championship, a record seldom if ever equaled at one of the large state fairs. Other shorthorn prizes won on calves sired by their herd bull, Hercules Golden Gift, were second and ninth on senior bull calves, second on senior yearling heifers, second and fourth on senior heifer calves, third on a pair of bull calves, and second on get of sire. Quite a record for one year--and it bears out a statement made 10 years earlier: "It is the policy of the station to make the herds as largely of our own breeding as possible, striving to develop them to a high degree of merit by the use of good sires."

Farm management records have shown that a beef herd was a low return enterprise compared to other classes of livestock, but many beef cow herd owners disagreed with such reports. Project 4301, "Feeding Management and Returns of a Beef Breeding Herd in Minnesota," was instituted in 1958 at the West Central Experiment Station. That fall the Shorthorn females of the Crookston, St. Paul, and Morris herds were consolidated at Morris. Six-year results are now available, and the findings clearly emphasize the importance of a high rate of calving and early elimination of nonbreeders and cows producing slow growing calves.

By degree, the beef herd continued to improve over the years, and in 1952, L. E. Johnson, regional coordinator of beef cattle breeding for the Federal Government, said "the Morris Station herd was one of the top herds in the area."

From 1950 to 1958 the herd was maintained primarily for classroom study. With the gradual phasing out of the School of Agriculture, there was no further use from this standpoint. At the present time approximately 40 Shorthorn

cows are carried in the herd and the most desirable heifer calves kept for replacements. The males are fed out as steers in feeding trials such as the following:

1. Effect of the fineness of grind in pelleted hay upon the feed lot performances and carcass quality of fattening calves.

2. A comparison of light weight versus heavy weight barley with beef or dairy fattening calves.

3. To determine the relative feed value of oats vs. oats and 50 percent ground shelled corn, and ground shelled corn only, in the fattening ration of beef calves.

The Horse Era

The "era of horses," when tractors were few and most of the farm work was done by horse power, might well be considered one of the most significant periods in the history of the West Central Experiment Station. This period began in 1927 with the acquisition of four purebred Percheron mares. By 1943 no less than 33 of these animals, 11 foals, and two sires, filled all available barn space. It was a situation that taxed the ingenuity of Oscar Beckstrom, farm foreman. Oscar's inherent love for horses, plus his skill in handling them, made him an ideal man for the job. At its peak this horse enterprise created a great amount of interest throughout the territory among horse fanciers who came long distances to look them over--buyers as well as breeders. Beautifully matched teams made a striking appearance in the fields, and it was not unusual to see six well-matched animals hitched in tandem moving heavy loads in and about the campus. There was also a demand for their use in parades, at county fairs, and similar celebrations. There were plenty of show-type horses, but only one attained fame in the show ring. "Myrtle," a very fine black Percheron mare, was judged the "Grand Champion" 3 year old at the Minnesota State Fair in 1937. During the early 1940's, however, increased farm mechanization very rapidly decreased the need for draft horses. By 1950 only a few horses remained at the West Central Station, and these were kept for more or less sentimental reasons. Even sentiment failed to halt the sale of the last team in 1952, and for the first time in its history the West Central Experiment Station was without a horse. The era had ended.

Six-horse hitch driven by Oscar Beckstrom

AGRONOMY

Definite experimental work in crops and soils at the "Morris Substation," later known as the West Central Experiment Station, was begun in the spring of 1914. Some experimental projects in farm crops and soils were set up, designed primarily to meet the needs of agriculture in western Minnesota: crop rotations with manure and phosphate fertilizer; varietal tests of corn, grain, and forage crops; cultural and seeding tests of alfalfa, red clover, and small grain; and some selection work with corn and alfalfa.

During those early years the experimental work with corn was centered around the then standard variety, Minnesota No. 13, in an attempt to fix more fully the breed characteristics and adapt it to the west-central section of Minnesota. At that time, little if anything was known about the genetics of corn. It was considerably later when plant breeders realized that real improvement in corn had to be accomplished through an improved germ plasm, purifying lines through inbreeding, and then crossing unrelated strains to secure hybrid vigor.

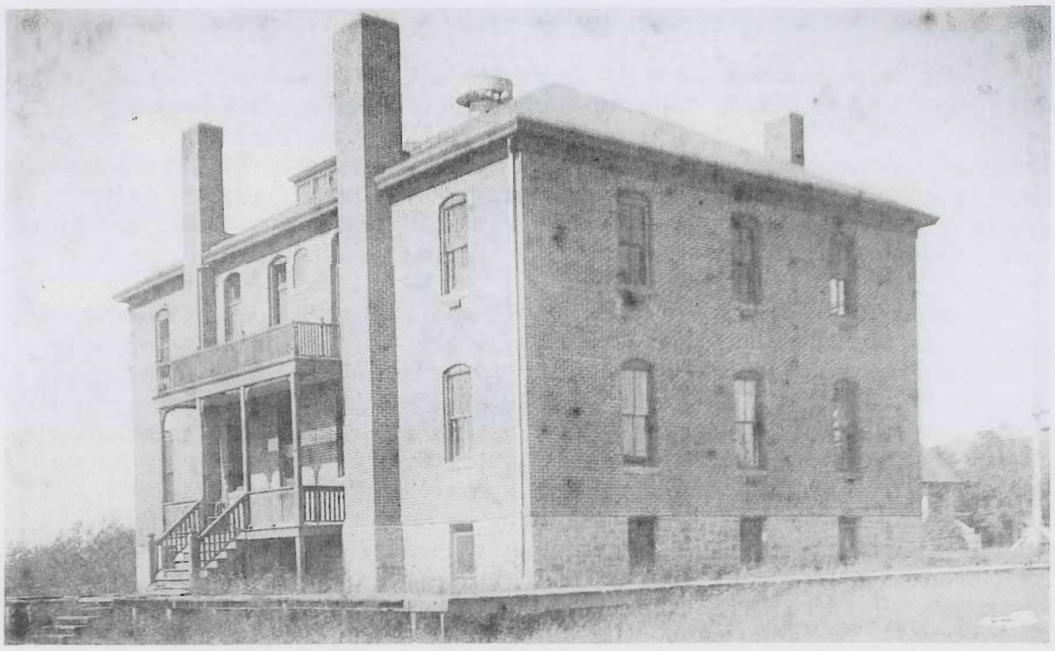
The problem of phosphate deficiency in soils of western Minnesota was first studied at the West Central Experiment Station through a 4-year rotation that was started in 1913, and, with the exception of a few minor changes, continued until 1956 when it was considered one of the oldest continuous phosphate and manure rotations in the United States. Data on the proper use of phosphate fertilizer, together with many cooperative trials on farms, served as a basis for rather extensive uses of phosphate throughout the territory. Definite project statements as well as some data on this old project are given later.

Of the 292 acres of land then owned by the institution there were only about 15 acres north of the building and approximately the same amount south of the campus that could be considered suitable for experimental work. In addition to about 40 acres devoted to the campus, the balance of the land was utilized for pasture or raising feed crops. Forty acres of the river bottom land was very sandy, suitable mostly for grass. More than half of the east quarter was very hilly besides being dissected by the Northern Pacific Railroad; about 60 acres of this plot was suitable farm land with the balance used primarily for pasture.

Practically all the farm work was done by horse power as only one tractor, a three-wheeled "Titan," was available at the time. Even this was not well adapted for field work and was used mainly for stationary work such as feed grinding, hauling, and threshing smaller plots of grain. An old steam engine was used for power in threshing the larger areas.

Chris Jenson, a young man from Denmark who graduated from the school in 1917, succeeded Gerhard Quitney as farm foreman in the fall of 1918. Chris was the first graduate of WCSA to join the U. S. Army during World War I. Chris resigned in 1922, and his brother Jens held the job until April 1927.

Oscar Beckstrom then moved into this position and served continuously for 35 years until his death in February 1962. It was during his regime that the station became interested in and well known for its purebred Percheron horses. A great deal of the success could be attributed to Oscar's love for horses and his skill in handling them. With the acquisition of more land in 1935 and 1937 and increased farm mechanization in the early 1940's, the need for draft horses declined rapidly and most had been disposed of by 1945.



The original agronomy building had been part of the Indian School.

The first progress report of the West Central Experiment Station was published in 1915 and included a brief summary of the experimental projects being conducted. It was primarily a "report of progress" rather than of completed work. The report stated that "while the station is not in a position to advise farmers and landowners with data of completed experimental projects at hand, yet the progress that has been made will be of interest to many."

It seems appropriate to include here some information on a few of the earlier long term projects, not to draw any conclusions, but as documentary evidence of the type of experimental work performed.

Some of the most important projects involved the use of commercial fertilizers in an attempt to answer such questions as, What is the most efficient phosphate fertilizer? How does it compare with the use of barnyard manure? Will it pay to use some of the commercial product in conjunction with manure? The significance of these fertilizer experiments may be seen to some extent by a statement of the project and the objectives.

Sub-Project I

A comparison was made of rock phosphate and phosphate and barnyard manure alone, as well as rock phosphate with manure and acid phosphate with manure, and the use of lime with all the above combinations on a 4-year rotation of corn, wheat, oats, and clover.

Plan of the experiment:

In spring 1914, 72 plots of 1/10 acre were laid out in four series of 18 plots each. A 4-year rotation of corn, wheat, oats, and clover was begun on these four series. The plots received the following fertilizer treatments:

Plots 1-7-13 No treatment (check plots)

Plots 2-8-14 Rock phosphate 2,000 pounds per acre.

Plots 3-9-15 Rock phosphate 2,000 pounds per acre.
Manure 8 tons

Plots 4-10-16 Manure 8 tons per acre

Plots 5-11-17 Manure 8 tons--acid phosphate 480 pounds per acre

Plots 6-12-18 Acid phosphate 480 pounds per acre

Each crop and each soil treatment had three checks to avoid experimental error. All rock phosphate plots received the initial application of 1 ton per acre in the spring of 1914, and no more was added during the period of the first two rotations. To start all crops the same year the full amounts of acid phosphate and manure were applied to the corn series, three-fourths of the total amount to the wheat series, one-half of the total amount to the oats series, and one-fourth of total amount to the clover series. In the spring of 1915 the acid phosphate and manure were applied only to the series in corn, and this policy continued each year. Also in 1915 the north half of each plot was treated with 1 ton of lime (ground limestone) per acre; in the fall this was increased to 3 tons per acre. With this treatment there were actually 144 plots included in the fertilizer tests. The soil upon which the plots were located was a Barnes silt loam, neutral to slightly acid in reaction. The organic matter content was high and the productive capacity under adequate rainfall equally high. The soils were high in available potash, but available phosphate is often inadequate for maximum crop yield. This project was set up and operated in conjunction with the Soils Division at University Farm. Chief of this division at the time was the late F. J. Alway.

Table 1. Phosphate And Manure Rotation

First-year data from the original phosphate and manure fertility plots.

Treatment	Corn	Wheat	Oats	Clover
	Bu/A	Bu/A	Bu/A	Tons
None	22.5	32.9	68.9	3.00
Rock phosphate	22.5	31.5	77.7	3.90
Rock phosphate & manure	26.6	33.0	71.5	4.00
Manure (only)	27.2	32.4	72.8	3.70
Acid phosphate & manure	26.1	32.7	68.6	3.75
Acid phosphate	25.0	37.2	77.7	3.60

Table 2. Crop Values and Increases Found in Fertilizers

Trials made at West Central Experiment Station during the first 3 years, 1915-17

Treatment	CORN		WHEAT		OATS		CLOVER		Increase in crop value over cost of fertilizer
	Yield in Bu.	Value	Yield in Bu.	Value	Yield in Bu.	Value	Yield in Tons	Value	
No fertilizer	36.0	$21.60	23.1	$23.10	64.9	$25.96	2.07	$16.56	- - - -
Rock phosphate	37.2	22.32	24.0	24.00	68.8	27.52	2.87	22.96	$ 0.42*
Rock phosphate & manure	42.2	25.32	25.7	25.70	71.4	28.56	2.97	23.76	2.92
Manure (only)	41.9	25.14	24.9	24.90	71.4	28.56	2.60	20.80	8.98
Acid phosphate & manure	41.9	25.14	26.4	26.40	69.6	27.84	2.89	23.12	7.28
Acid phosphate	40.5	24.30	27.2	27.20	70.8	28.32	2.79	22.32	10.12

* Indicates loss.

Table 3. Summary of Yields

1915 - 32

	CORN	WHEAT	OATS	CLOVER
	17-Year Ave. Bu.	17-Year Ave. Bu.	17-Year Ave. Bu.	17-Year Ave. Tons
No treatment	40.0	22.5	54.9	2.19
Rock phosphate	41.4	23.3	52.2	2.47
Rock phos. & manure	46.2	27.0	63.9	2.73
Manure (only)	45.5	27.3	68.0	2.67
Acid phos. & manure	46.0	28.8	70.9	2.81
Acid phosphate	43.5	27.1	63.9	2.62

The data included in tables 1, 2, and 3 have been submitted merely as an historical record of this classic old rotation which was conducted on a 4-year basis continuously without change from its inception in 1914 until 1938 and in a modified form from 1938 until it was discontinued in 1959.

Complete data with explanations are published in the annual reports of the West Central Experiment Station, 1915-26, and a final report in Station Bulletin 448 on "The Comparative Value of Rock Phosphate and Superphosphate as Fertilizers," published in 1958 by R. O. Bridgford and C. O. Rost.

In addition to demonstrating the value of a phosphate fertilizer for western Minnesota soils, the longtime averages showed conclusively that manure alone produced almost as high yields as the combination of manure with either of the two phosphates and, at cost prices assumed, proved the cheapest fertilizer. Acid phosphate when used alone gave about the same results as manure alone except in the case of wheat where it gave a higher yield. The combination of acid phosphate with manure produced about the same amount of corn and hay, more wheat, but less oats than manure alone. The value of all four crops together (Table 3) was likewise only a trifle higher than where the same amount of acid phosphate was used without manure.

A fertilizer experiment with alfalfa titled "The Use of Gypsum, Manure, Rock Phosphate, and Sulphate of Potash, and the Use of Lime with all the Above Combinations on Alfalfa" also began in 1915. The treatments used were as follows:

Plots 1-6-11-16 - No treatment (or checks)
Plots 2-7 - Gypsum, 1,000 pounds per acre in 1915

Plots 3-8 - Acid phosphate, 480 pounds per acre each year.
Plots 4-9 - Acid phosphate, 480 pounds, and sulphate of potash, 240 pounds per acre per year.
Plots 5-10 - Sulphate of potash, 240 pounds per acre each year.
Plots 12-14 - Rock phosphate, 200 pounds per acre each year
Plots 13-15 - Manure, 8 tons per acre each year

The north half of each plot was treated with ground limestone at the rate of 3 tons per acre in 1915. Some results are submitted in table 4.

Table 4. Treatment and Yields Per Acre on Fertilizer Plots in Alfalfa and a 10-Year Average

Plot	Treatment	1926 Lime 1 Ctg. Tons	1926 No lime 1 Ctg. Tons	1926 Total Tons	1925 Total Tons	1924 Total Tons	1923 Total Tons	1922 Total Tons	10 yr. Ave. Tons
1-6-11-16	None	.66	.65	.64	1.70	1.55	2.56	2.93	2.60
2-7	Gypsum	.69	.58	.63	1.62	1.50	2.48	2.94	2.74
3-8	A. phos.	.73	.63	.68	2.11	1.97	3.18	3.51	3.23
4-9	A. phos. Sul. of potash	.73	.65	.69	2.22	2.29	3.08	3.87	3.34
5-10	Sul. of potash	.68	.72	.70	1.85	1.64	2.83	3.24	2.87
12-14	Rock phos.	.75	.60	.68	1.66	1.61	2.55	2.86	2.62
13-15	Manure	.84	.82	.83	1.95	2.11	2.90	3.31	2.85

Plots treated with acid phosphate and manure gave the larger yields, and average yields for several years showed the same results. It appeared that either barnyard manure or acid phosphate, each used alone, were the best fertilizers that could be used on alfalfa in western Minnesota.

Other agronomy projects being initiated and carried on in 1915 included:

(1) A corn breeding experiment which involved the selection of Minnesota No. 13 corn by the centgener method.

(2) Varietal tests of wheat, oats, barley, rye, and field peas.

(3) Alfalfa Investigations--The breeding and testing of pedigreed strains and types of alfalfa. Rate of seeding tests with alfalfa. Soil and culture inoculation tests. Various nurse crops vs. no nurse crops, and time of seeding tests.

(4) Clover Investigations-- Rate of seeding medium red clover. Use of various nurse crops with red clover and varietal tests of clovers.

Because of the fact that these varietal tests of grain and alfalfa were the first ones conducted at the experiment station 50 years ago, it is of interest to note the various strains used and the yields obtained during the crop year 1915.

Table 5. Varietal Test Yield Data - Alfalfa and Grain - 1915.

Alfalfa Variety	Yield Pounds	Corn	Yield Bu.	Wheat Variety	Yield Bu.	Oats Variety	Yield Bu.	Barley Variety	Yield Bu.
Kansas	6,944	Silver King	33.5	Marquis	29.0	Imp. Ligowa	100.5	Minn. 105	45.0
Baltic	6,038	Minn. 455	35.0	Fife	22.7	Early Gothland	80.5	Oder-	
Grimm (true)	6,387	Early Murdock	27.8	Bluestem	21.5	White Russian	68.9	brucker	39.2
Grimm (so call)	5,712	Pride	35.3	Preston	40.0	Swedish	87.4	Minn.230	35.5
Nebraska	5,460	Minn. 13	41.3	Kubanka	33.9	Black Beauty	64.2		
Dakota	5,391	Rust White	38.2	Hybrid	12.1	Kherson	72.8		
Imp. Turkstan	6,183	Minn. 23	22.1	Hybrid	11.1	Excelsior	94.8		
		White Cap.	38.6						
		N. W. Dent	26.8						

Weather data for the season indicated that 1915 was marked by excessive rainfall and below normal mean temperatures. Precipitation during the growing season, April through August, totaled 23.40 inches, an amount equal to the annual average at Morris. The cool weather favored both wheat and oats, with little damage from stem rust. Some wheat scab was prevalent, however, ranging from 2 to 10 percent.

Rates of Manuring

During the early years of the West Central Experiment Station, barnyard manure was the most common and most universally used of all fertilizers. The most progressive farmers were giving attention to the conservation of all manure produced on their farms and trying to make it cover as much ground as possible. Much literature had been written concerning its use, but little if any data was available that would apply directly to the black prairie loams and silt loams of western Minnesota. In an attempt to determine the amount to use an experiment was set up in 1916 using a 4-year rotation with the crops succeeding one another in this order: corn, wheat, barley, and clover with timothy. The manure was applied at the rates of 0-4-8-16-32 tons per acre to the clover sod before it was plowed for corn, and only one application was made during the 4 years of the rotation. With the 1926 crop, yields for 10 years were available for corn and wheat, 9 years for barley, and 6 years for clover. In 3 different years clover failed to make a stand, presumably because of heavy lodging. The following table gives the results through 1926.

Table 6. Average Yields of Corn, Wheat, Barley, and Clover From Different Rates of Manure

Treatment	Corn, 10-yr. Bu.	Wheat, 10-yr. Bu.	Barley, 9-yr. Bu.	Clover & Tim., 6-yr. Bu.
32 Tons/acre	51.2	27.9	48.9	3.54
16 Tons/acre	52.0	30.5	46.5	3.37
8 Tons/acre	52.8	30.2	45.4	3.16
4 Tons/acre	49.7	29.6	43.8	3.02
NONE	47.7	29.8	41.0	2.81

The data indicated that 8 tons of manure per acre was the most effective amount on a 10-year average for corn, but no positive results were obtained in the case of wheat or barley. This might have been due to the high state of fertility of the land at the beginning of the experiment, still evident as shown by the yields from the nontreated plots. A considerable amount of lodging of grain occurred where heavy rates which undoubtedly affected the yields were applied.

Considerable thought also had been given to alfalfa during the early years, particularly with the idea of securing strains hardy enough to withstand winter temperatures of the Northwest. Of the 31 strains tested, Grimm and Baltic appeared most desirable, having suffered little if any winter killing during the years 1913-14-15 and a minor amount in 1916. In addition to these varietal trials of alfalfa and the fertilizer investigations a 2-year study was conducted on rates and dates of seeding, cultural methods, and inoculation.

Table 7. Alfalfa Seeding Tests - 1915

Plot	Date Sown	Pounds seed per acre	Method of seeding	Yield/A. 1916 Tons	Yield/A. 1917 Tons	Average yield-1916-17 tons
1-21	April 17	12	Broadcast with rye	2.24	2.48	2.36
2-22	August 5	12	Sown after rye harvest	1.41	0.0	0.0
3-23	April 17	12	Broadcast with barley	2.13	2.65	2.39
4-24	April 17	12	Drilled with barley	2.03	2.11	2.07
5-25	July 31	12	Seeded after barley harvest	2.23	1.85	2.04
6-26	April 17	12	No nurse crop	3.00	4.02	3.51
7-27	April 17	12	Broadcast with wheat	2.72	2.88	2.80
8-28	April 17	12	Broadcast with oats	2.07	2.15	2.11
9-29	July 28	12	Sown after oats harvest	1.18	2.08	2.63
10-30	June 1	12	No nurse crop	2.28	2.73	2.51
11-31	June 15	12	No nurse crop	2.47	2.85	2.66
12-32	July 1	12	No nurse crop	2.66	2.92	2.79
13-33	July 15	12	No nurse crop	2.68	3.36	3.02
14-34	July 30	12	No nurse crop	2.43	2.87	2.65
15-35	June 15	10	No nurse crop	2.34	3.20	2.77
16-36	June 15	8	No nurse crop	2.49	3.15	2.82
17-37	June 15	14	No nurse crop	2.41	3.27	2.84
18-38	June 15	12	Commercial inoculation	2.47	3.00	2.73
19-39	June 15	12	Soil inoculation	2.40	3.01	2.71
20-40	August 1	12	Broadcast in corn at last cultivation	1.48	0.0	----

In the 1917 progress report it was stated that "bare seeding has given uniformly better results than using a nurse crop. Early spring seeding without a nurse crop has exceeded all other methods."

Alfalfa as a Rotation Crop

In 1916 alfalfa was rapidly becoming one of the leading forage crops on Minnesota farms, particularly where livestock was an important enterprise. Hardy varieties were being developed with substantial amounts of seed available, and stands were easy to obtain. With more farmers appreciating the value of alfalfa as a forage crop, greatly increased acreages were evident in all sections of Minnesota to which the crop was adapted. Some questions remained to be answered, however. When an old alfalfa stand is to be broken up, what would be the best sequence of crops for use in succeeding years? What is the best crop to follow alfalfa? Can alfalfa hay land be utilized in a rotation? To answer some of these questions, particularly for western Minnesota, the West Central Experiment Station in 1916 began a series of alfalfa rotation experiments, some continuing until the project ended in 1929. Some of the results are published in this report.

Plans were made in 1915 using a piece of ground having a good stand of Grimm alfalfa that was sown in 1913. These methods were followed:

1. Fall plowed in 1915 with the three crops, corn, wheat, and barley, planted in triplicate plots in 1916.

2. Second year--Wheat and barley plots planted to corn and corn plots sown to wheat.

3. Third year--Following alfalfa, all plots planted to corn.

4. Fourth year--All plots sown to barley as a companion crop to alfalfa.

5. The fifth, sixth, seventh, and eighth years the series was in alfalfa, with the rotation repeated starting the next year.

Table 8 reports the alfalfa yield and rainfall during the growing season.

Table 8. Yields of Barley and Wheat Following Alfalfa

YEAR	Barley as first crop after alf.	Barley as fourth crop after alf.	Precipitation Apr. 1-Aug. 1	Wheat as first crop after alf.	Wheat as second crop after alf.	Precipitation Apr. 1-Aug. 1
	Bushels	Bushels	Inches	Bushels	Bushels	Inches
1916	31.1	---	20.96	---	---	---
1917	35.6	---	10.64	27.7	32.6	10.64
1918	29.9	---	11.78	19.0	35.5	11.78
1919	38.3	---	15.13	15.5	17.7	15.13
1920	35.6	32.9	17.79	15.2	17.5	17.79
1921	34.7	50.0	10.61	14.9	20.0	10.61
1922	37.9	41.9	8.90	26.2	28.2	8.90
1923	39.4	53.0	11.66	18.4	16.9	11.66
1924	35.2	53.2	11.63	23.2	33.2	11.63
1925	37.7	49.4	12.87	15.1	16.9	12.87
1926	8.2	31.7	4.98	4.7	8.3	4.98
1927	26.3	53.1	10.35	17.9	23.5	10.35
1928	36.0	50.1	13.18	11.1	13.8	13.18
1929	22.6	38.2	12.07	14.4	19.2	12.07
Average	31.4	45.4		17.2	21.8	

Yield data in table 8 showed a decided increase in barley sown the fourth year after alfalfa in comparison to that sown the first year. Wheat made a more favorable showing immediately following alfalfa, but it too suffered from a lack of moisture. Corn likewise appeared to suffer from a shortage of moisture when planted as the first crop after alfalfa, yielding considerably better as the second or third crop as shown in table 9.

Table 9. Summary of Corn and Grain Yields in the Alfalfa Rotation.

Crop	No. plots each year	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	12-year average
		Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.
Corn as first crop after alfalfa	3	47.0	48.8	48.6	56.5	52.5	37.6	33.9	27.3	29.2	47.0	41.9	38.4	42.4
Corn as second crop after alfalfa	6	50.8	51.6	49.0	59.2	46.4	39.4	53.4	33.6	33.1	50.0	48.2	42.9	46.5
Corn as third crop after alfalfa	9	54.1	51.8	43.8	64.7	52.5	42.7	46.9	43.6	38.3	43.1	53.7	48.2	48.6
Wheat as the first crop after alfalfa	3	19.0	15.5	15.2	14.9	26.2	18.4	23.2	15.1	4.7	17.9	11.1	14.4	16.3
Wheat as the second crop after alfalfa	3	35.5	17.7	17.5	20.0	28.2	16.9	33.2	16.9	8.3	23.5	13.8	19.2	20.9
Barley as the first crop after alfalfa	3	29.9	38.3	35.6	34.7	37.9	39.4	35.2	37.7	8.2	26.3	36.0	22.6	31.8
Barley as the fourth crop after alfalfa	9	----	----	32.9	50.0	41.9	53.0	53.2	74.0	31.7	53.1	50.1	38.2	39.8

These data are submitted primarily as a record of one of the first long-time rotation experiments instituted at the West Central Experiment Station. Full details on the project were published in 1930 in Minnesota Experiment Station Bulletin No. 265. The purpose, to obtain information on sequence of crops following alfalfa, seemed to have been fulfilled. It was comparatively easy to obtain a stand of alfalfa using a companion crop; alfalfa could successfully be used in a rotation; corn was the most logical crop to follow alfalfa with grain crops to follow during the later years of the rotation.

An event which undoubtedly helped popularize alfalfa was the Corn and Alfalfa Exposition held in Morris during mid-December 1913. Agronomist Miller took an active part in staging the affair and was instrumental in seeing that the speaking programs were carried out efficiently and on schedule. In the 75th Anniversary Edition of the Morris Tribune, Miller made this comment: "In 1913 the Corn and Alfalfa Exposition was held in Morris. It was a stupendous success. Special trains came into the city from all directions. Thousands of people participated in the events and programs of the exposition days. This and the corn and alfalfa shows that followed in other parts of the

area gave rise to a sustained movement that through the years has materially changed the farming business, not only in Stevens County, but throughout all of west central Minnesota."

Commenting on this event in 1947, the Tribune stated that "The big event that residents of the community 34 years ago still talk about as the peer of all festivals in Morris is the famed Corn and Alfalfa Show held in Morris on December 10, 11, and 12, 1913, under the sponsorship of the West Central Minnesota Development Association."

In Addition to the crowds of people from all over western Minnesota, more than 200 Minneapolis businessmen came out on a special train for 1 day of the show. Remarkably mild weather prevailed. It was mid-December, but temperatures were so mild that overcoats were conspicuous by their absence.

In addition to the above mentioned projects, an experiment had been started in 1916 on the utilization of medium red clover in a 4-year rotation of corn, wheat, barley, and clover. The clover was to be handled as follows:

1. Both crops cut for hay.
2. First crop cut for hay, second pastured.
3. Both crops pastured.
4. First crop clipped, second plowed under.
5. First crop for hay, second plowed under.

Table 10. Clover Utilization Rotation

Summary of Yields

	Corn 11-yr. ave. Bu.	Wheat 8-yr. ave. Bu.	Barley 8-yr. ave. Bu.
1. Both crops hay	43.8	22.0	35.9
2. First crop hay, second pasture	45.9	21.4	37.5
3. Both crops pastured	44.7	21.4	36.0
4. First crop clipped, second plowed	42.7	20.7	36.0
5. First crop hay, second plowed	44.1	21.1	36.4

The purpose of this experiment was to determine the effect of different methods of utilizing the clover crop. Data indicated that it was not profitable to plow under clover on an average silt loam soil. Pasturing during the entire season increased the yields of corn, but not significantly. With wheat and barley, the results for several years showed no effect on yields. It should be kept in mind that this experiment had been conducted on a silt loam soil, and the results may not be applicable to sandy soils in western Minnesota or to soils in which the organic matter has been depleted through long continuous cropping.

Wheat Straw and Corn Stover As Fertilizers

A project was begun in 1916 to determine the fertilizing value of wheat straw and corn stover when plowed under. A 2-year rotation of wheat and corn was followed, and the crop residues were applied at the rate of none, 1 ton, 2 tons, per acre. Wheat straw and corn stover were plowed under at the above

rates in 1916, 1917, 1918, and 1919. No residues were applied in 1920, 1921, 1922, or 1923, and any differences in yield in these 4 years were caused by the residual effect of the straw and stover. In 1924 the straw and stover again were applied to the plots. The yields of corn in 1924 and 1925 were not much influenced by either the straw or stover applications. Very marked increases were obtained, on the other hand, from the wheat plots for both the straw and stover applications in 1924, and still greater increases were obtained in 1925.

Brief summarized data on this project are given below.

Table 11.

	Corn			6 yr.* Ave.	Wheat			6 yr.* Ave.
	1926 Bu.	1925 Bu.	1924 Bu.	Bu.	1926 Bu.	1925 Bu.	1924 Bu.	Bu.
Straw, 2 tons	39.1	30.0	38.1	40.6	15.2	19.6	29.9	21.9
Straw, 1 ton	37.9	31.5	35.0	39.6	14.2	18.2	26.8	19.8
No treatment	38.7	31.8	38.0	39.5	15.0	12.9	19.2	17.2
Stover, 2 tons	39.4	31.1	42.2	42.9	15.8	16.9	31.4	21.0
Stover, 1 ton	39.8	33.1	41.5	40.4	15.6	14.5	25.8	19.0

* Yields include those of 1921, 1922, and 1923.

New Rotation Experiments

Proper sequence of crops and the type of a rotation best adapted to the needs of a particular method of farming were pertinent questions in 1919. A 3-year rotation of corn, oats, and clover; a 4-year rotation of corn, wheat, oats, clover hay, and clover and timothy hay; and a series of alternate vs. continuous cropping experiments with barley and wheat, barley and oats, and wheat and oats were begun. With the rotations previously noted, the station at that time had a comprehensive set of experiments designed to meet the needs of various-sized farms and different systems of farming. A brief explanation of these rotations, together with some data, follows in tables 12, 13, and 14.

3- and 5-Year Rotations

A 3-year rotation with oats, clover, and corn was begun in 1919, along with a 5-year rotation including corn, wheat, oats, clover, and clover and timothy. In the 3-year rotation, 6 tons of barnyard manure per acre were applied once in 3 years. In the 5-year rotation, 10 tons were applied once in 5 years. In each case the fertilizer was applied to the land preceding the corn crop. It is well to note that the land upon which these plots were located was rather low in fertility and was selected with the idea of demonstrating the value of rotation and barnyard manure. Brief summaries of these two rotations are given in tables 12 and 13.

Table 12. Average Yields Per Acre of Oats, Clover, and Corn Grown in Triplicate Plots in a 3-year Rotation, 1919-26.

Plot			1926	1925	1924	1923	1922	1921	1920	1919	8-yr. ave.
1-4-7	Oats	Bu.	43.49	101.67	82.2	40.5	58.5	64.7	40.5		57.4
2-5-8	Clover	Tons	.85	2.90	3.4	2.13	3.8	4.0	----		2.8
3-6-9	Corn	Bu.	50.87	38.27	47.8	2.70	49.9	62.6	55.9	43.3*	46.8

Table 13. Yields Per Acre of Oats, Hay, Corn, and Wheat Grown on Triplicate Plots in a 5-year Rotation, 1919-26.

Plot			1926	1925	1924	1923	1922	1921	1920	1919	8-yr. ave.
1-6-11	Oats	Bu.	23.5	72.7	55.4	55.7	47.1	68.4	37.3	44.4	50.5
2-7-12	Cl. & Tim.	Tons	.55	2.2	2.6	1.7	3.3	2.8	----	----	2.2
3-8-13	Timothy	Tons	.49	.90	1.7	1.5	2.0	----	----	----	1.3
4-9-14	Corn	Bu.	50.0	30.4	41.4	30.2	52.0	61.8	57.5	36.2	44.9
5-10-15	Wheat	Bu.	16.9	16.4	37.4	27.0	29.7	22.2	12.4	13.7	22.2

Table 14. Yields From Alternate and Continuous Cropping Plots

Crop	System of cropping	Yield Per Acre 1923 Bu.	1922 Bu.	1921 Bu.	1920 Bu.	4-yr. Average
Wheat	Wheat following oats	15.9	17.2	18.2	16.8	17.0
Wheat	Wheat following barley	15.6	16.9	19.3	16.4	17.0
Wheat	Wheat following wheat	12.5	15.0	17.7	15.0	15.0
Oats	Oats following wheat	23.6	39.6	68.6	39.1	42.7
Oats	Oats following barley	23.3	41.0	68.3	43.5	44.6
Oats	Oats following oats	26.2	39.9	64.8	42.1	43.2
Barley	Barley following oats	28.0	27.3	40.1	29.0	31.1
Barley	Barley following wheat	26.6	23.1	38.7	29.9	29.6
Barley	Barley following barley	31.6	22.8	39.7	30.0	31.0

While no conclusions may be drawn from these data, the average yields are much below those on the 3- and 5-year rotations. It was impossible to control the weeds, particularly quackgrass and wildoats. This project was discontinued after 5 years.

Land Assets and Expansion

The station acquired some additional 450 acres in the mid 1930's. The Max Trantow farm, lying directly south of the campus, 160 15/57 acres of rather rolling land, was purchased in 1935 and was commonly referred to as the "south" farm. Two years later a deal was made with Paul Spooner for 286 57/57 acres directly north of the city of Morris. This is now identified as the "north" farm. Unlike the south farm, this tract required some underdrainage to permit efficient farming measures.

Because of their close proximity to the campus and the excellent character of the soil, both farms have proven to be valuable additions by providing much needed pasture, adequate feed crops, and more suitable land for experimental projects and the production of certified seed grain. The total acreage at that time was 823.82 acres. This figure remained unchanged for 20 years. In 1962 Highway 28 was rerouted across the south side of the north farm, and 17.33 acres were purchased by the State Highway Department. In 1960 a block of 33.01 acres lying directly east of the station orchard was purchased and is being used exclusively for the growing of rod row and small grain plots, as well as for increasing small lots of pure seed for registration. Its close accessibility to the buildings makes it an ideal location for use in small grain investigations.

Two more real estate deals of rather substantial proportions were closed in Frebruary 1965. A plot of 7.83 acres from the southwest corner of the north farm was sold to the city of Morris and a 400-acre farm lying $\frac{1}{2}$ mile east of the campus was purchased. This area, known as the Johnson farm, was acquired on February 6, 1965. As of May 1, 1965, the land assets of the West Central Experiment Station totaled 1,231.67 acres.

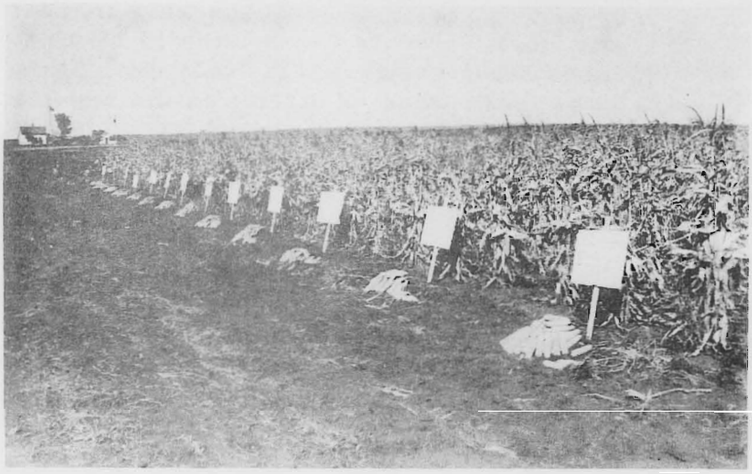
Certified Seed Production

Although the production and distribution of certified seed grain became quite important in later years, there was little in the line of superior seed available until the middle and late 1920's. Many varieties of corn, wheat, oats, barley, flax, and soybeans had been and were being tested, but no one strain seemed to have the necessary qualities to warrant its recommendation to farmers in western Minnesota. Little was known about the merits of soybeans, although a 1920 report indicated that many farmers were becoming interested in them. Because of its early maturing qualities, the "Minsoy" variety was the first to be increased at the station. Approximately 200 bushels of excellent seed were available for distribution, but there were no takers. There was no demand for it as seed, or as market beans, so the entire lot was turned over to the Animal Husbandry Department, ground, and used for feed. In 1919 and 1920 farmers were thinking of soybeans as a dual purpose crop--for forage as well as seed. Minsoy, however, while an excellent seed producer, was a very short growing plant, so of little use as hay or forage. Naturally being a small seeded variety, its agronomic characters appeared unsuitable to attract much attention from the crushers. It was later recommended for corn in hogging down.

Soybeans were becoming increasingly popular with western Minnesota farmers, but the demand was for varieties known to have early maturing qualities. Seven varieties were on test in 1920 with seed yields averaging from 16-35 bushels per acre. Chestnut, a brown seeded variety, was the earliest in maturity, but with favorable weather prevailing all seven strains ripened satisfactorily. Chestnut, Elton, and Soysota were grown and increased for production in 1920. Old records show that only a few bushels of the Chestnut variety were sold, but 25 bushels were distributed to farmers in 1922.

Despite their interest, most of the farmers' efforts with soybeans were limited to planting for some emergency hay. Planting with corn was for "hogging off" with some for seed that in many cases was ground and used for feed. Lack of a market seemed to be the principal deterrent, and in many cases facilities for handling the crop were inadequate. The domestic and Oriental markets had not yet been developed, and, as a matter of fact, it is now known that the varieties being grown here were not the type they desired.

These hybrid corn plots were exhibited at the first corn field day in 1939.



Author Bridgford showed visitors the new barley varities.

Grain varietal trials were seen at Morris in 1958.

The varietal tests of soybeans were increased to 11 varieties in 1922, 1923, and 1924. Twenty years later 11 strains were in regular yield trials, but of those being grown in 1923 only one, Minsoy, was in the 1943 trials. Ten years later there were 18 strains in the regular tests, but Minsoy was not among them.

The demand was strong for certified seed grain as early as 1922, and the station supply was soon exhausted that year. About 500 bushels of Victory Oats, 175 bushels of Minnesota No. 13 corn, 300 bushels of Improved Manchuria barley, 75 bushels of Marquis wheat, and 25 bushels of Chestnut soybeans were sold to farmers, who seemed anxious to improve the yield and quality of their crops. Seed distribution continued to increase, and about the only obstacle was the shortage of suitable land upon which to produce it. Weeds, both noxious and otherwise, created a cleaning problem. Storage space was inadequate. Furthermore, all field work was done by horse labor, and the farm implements at the time left much to be desired as far as weed control was concerned. It was a constant struggle to turn out a quality product that would pass inspection and meet the requirements for certified seed.

A new seed house was erected in 1924 with 12 cement bins, a new "Clipper" cleaner, a grain elevator for filling the bins, and a small farm-sized disc mill. Since the bins were uncovered on top, there was always the hazard of mixtures, and extreme caution was necessary when grain was being delivered.

Hybrid corn was unknown in 1920, but 5-year results were available on the yields of nine varieties of the so-called open pollinated varieties. Two of these, Minnesota No. 23 and Northwestern Dent, seemed well adapted and matured satisfactorily every year. Minnesota No. 13, which later became a very popular strain, was the highest yielding variety during these 5 years, averaging about 46.0 bushels per acre. There was some question as to whether it would, in an unfavorable season, mature sufficiently well for keeping, but to date there had been no difficulty. It was thought that 7 years careful seed selection had produced some improvement in yield and maturing qualities, but we now know that was questionable. At the time, however, it was considered the best, most dependable variety to use, and the demand for seed was greater than the supply. Old records indicate that some of the first seed sales from the West Central Experiment Station were for a limited amount of Minnesota No. 13 seed corn. Because it proved to be in the 100 day maturity class, earlier than either Northwestern Dent or Rustlers White Dent, the demand for seed increased.

A statement in the 1921 Progress Report of the station reads: "The distribution of certified seed, true to variety, and from high yielding strains is an established project at the West Central Station and will be continued in order that better varieties of farm crops may be more widely grown throughout the district." In 1922 the total supply of certified seed available was still inadequate for the demand. Approximately 500 bushels of Victory oats, 175 bushels of Minnesota No. 13 corn, 300 bushels of Improved Manchuria barley, 75 bushels of Marquis wheat, and 25 bushels of Chestnut soybeans were sold to farmers in the surrounding area.

Seed grain sales began to show a profitable effect on the budget, prompting Superintendent Miller to make available more land suitable for the production of seed. The new seed house with modern cleaning equipment helped step up this phase of the work. Alfalfa entered the picture, too, and 850 pounds of certified Grimm alfalfa seed was distributed from the station in 1923. The records show that this was the first alfalfa seed sold.

Weeds were always a menace during these formatave years, especially on land that had been grain farmed with little or no cultivated crops. Wild oats and quackgrass were the real culprits, being difficult to control and causing a problem in separating their seed from small grain and legumes.

Due to the prevalence of and damage caused by stem rust during the late 1920's, particularly on wheat, there was great demand for a variety of hard red spring wheat having resistance to this disease and suitable milling qualities. In 1927 it was decided to increase Marquillo (a Marquis x Iumillo cross), a new strain that had been developed by the plant breeding section of the University. This was a beardless strain with good yielding ability under rust conditions and, according to the description, "similar to Marquis in milling and baking qualities." All available Marquillo seed was increased at the West Central Station so as to have more information on its merits and yielding ability when grown under rust conditions. Though its milling qualities were somewhat similar to Marquis, its flour produced a yellow loaf, making it unacceptable to the milling industry. It only remained on the list of recommended varieties through 1933 when it was superseded by a strain called Thatcher.

Another controversial strain of red spring wheat, Willet, had been in the making for several years and was finally put on the list of recommended strains in 1954. It was moderately resistant to stem rust, resistant to leaf rust, and more resistant to scab than other recommended varieties. Comparative yield data for all varieties grown at six experiment stations from 1944 to 1953 and in southwestern Minnesota from 1947 to 1953 showed Willet to be the highest yielding bread wheat with Lee second and Rushmore third. All recommended varieties showed acceptable milling and baking qualities, although Willet had a shorter dough mixing time than the other strains, a characteristic considered undesirable by representatives of the milling industry. Despite its apparent admirable characteristics such as superior yielding ability, good test weight, and good milling and baking quality, its short mixing time eliminated it from the miller's standpoint, so it never reached the hands of the growers. The station could only dispose of its 2,400 bushels of available seed on the market. This was a blow to the plant breeders, but with the miller's rejection of the variety there seemed no other recourse. Lee, Rushmore, and Mida were the only bread wheats still on the list of recommended varieties in 1954 with Selkirk, a Canadian variety, being added in 1955. Rushmore was removed from the list in 1956, leaving only Lee and Selkirk in the bread wheat class.

Exceptionally favorable crop results were obtained in 1955 and 1956, the writer's last year. The West Central Experiment Station had a substantial amount of excellent seed grain and soybeans, and fortunately, the demand from growers was good. On leaving, it was gratifying to realize that the budget was boosted by $18,000.00, the highest figure from seed grain sales for any year up to that time.

Gopher Oats

No variety of grain ever exceeded Gopher Oats for period of service or longevity. Of the scores of varieties developed by the University and distributed by the Morris Experiment Station, few, if any, received more plaudits and fewer criticisms than Gopher Oats. From a pure line selection out of "60 Day," it was placed on the list of recommended varieties and remained there for 17

years from 1925 to 1942, longer than any variety of grain. It was grown continuously at the station from 1920 through 1964. Despite its susceptibility to stem rust, crown rust, and smuts, its inherent yielding ability continued to manifest itself, as shown in the official yield data in table 15. It was sold to growers in Minnesota as well as other states and countries including Alaska, Germany, Holland, and Scandinavia.

Table 15. Official Yields Gopher Oats From Comparative Yield Trails, 1920-62.

Year	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
Bu./acre	39.1	48.7	59.9	45.7	83.6	89.5	49.1	68.8	49.9	79.1	52.7	67.8
Year	1932	1933 (Dry)	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
Bu./acre	61.4	0.0	0.0	71.8	48.6	54.3	84.7	41.4	81.4	52.5	111.5	52.5
Year	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Bu./acre	71.7	105.0	84.6	100.9	108.2	76.6	88.1	128.5	85.3	79.3	71.1	65.6
Year	1956	1957	1958	1959	1960	1961	1962					
Bu./acre	66.3	71.5	126.3	61.8	Hail	68.1	53.5					

E. C. Stakman spoke at the 1945 Station Day program. Superintendent Fenske presided.

The First Station Day

The first field day in July 1916 combined a host of entertainment features with the primary purpose of the day: to have University officials, Regents, staff members from the Central Experiment Station at St. Paul, and the general public see, inspect, and possibly evaluate the work already underway at the West Central Experiment Station.

The city of Morris declared a holiday; businessmen closed up their places for part of the day. Teachers and students of the summer school performed maypole and folk dances; 12 young ladies participated in a milking contest; and men from various farm clubs exhibited their skill in judging livestock. F. B. Snyder, president of the Board of Regents; Frank Murphy, a prominent lawyer from Wheaton; and George Vincent, president of the University, were featured speakers. At the conclusion of this portion of the program, Superintendent Higbie announced that similar visitation days would be held annually in Morris.

The main activity of the day was, of course, an inspection of the field experimental plots, livestock herds, buildings, and grounds. A local paper stated that "Visitors by the thousands and automobiles by the score traveled the lanes which led through the 1,000 field experiments being conducted by the station to determine the problems of soil fertilization, crop rotations, land preparation, continuous cropping versus rotations, weed control, and testing of corn and grain varieties." Considerable emphasis was given to the testing of winter wheat and alfalfa for winter hardiness. The purebred shorthorn and Polled Angus beef cattle and the dairy herd of Holsteins and Guernseys drew considerable attention as well. "The most popular of the many experiments visited" was one Jordan chose to call the "hog restaurant." A series of hog feeding trials were set up using various "menus" or rations with and without alfalfa to determine the cheapest way to grow pork.

That the day was considered worthwhile was evident from comments of visitors and reports in the papers with such headlines as "Progress Made at Farm School Astonishes Hundreds of Visitors," "Annual Station Meet Reveals Importance of State Institution in West Central Minnesota," "Regents Pleased with the Farm School," and "Hog Restaurant Is Finding Feed Facts."

From a farmer's standpoint, the West Central Experiment Station was just that, an "experiment," during the early years. It was some time before the results of the experimental work were recognized or appreciated by the farmers of western Minnesota. They seemed reluctant to take advantage of the work, or even come to the station to ascertain what was going on. Visitation or Field Days were held annually during midsummer in an attempt to acquaint people with some of the projects, grain improvement, soils and rotation experiments, fertilizers, and weed control, but for the most part, these affairs were poorly attended for several years. Severe stem rust epidemics during the late 1920's posed a threat to the entire small grain program. The development and release of rust resistant grain by the University Experiment Station offered the growers a chance to secure some of this precious seed and to see and learn about other projects being conducted at the West Central Experiment Station. From that time interest increased rapidly; visitors were commonplace and numerous. There was no longer a question of having substantial crowds at field days but a question of how to handle them in the most efficient manner.

A record-breaking crowd estimated at between 8,000 and 9,000 overflowed the campus and all surrounding areas in 1920. Headlines in the Morris Tribune for July 23, 1920, read "Visitors Day Brings Huge Crowd to Town"

and "Thousands Visit the Agricultural School-Attend Debate and Partake of Oxen."

Large delegations came from the 17 counties of west central Minnesota. From early morning until late at night the campus was filled with people. It was a unique visitation day. This was one field day in which the city of Morris joined with the station in the financing and promoting. People of the surrounding area had a chance to inspect and see the work of the experiment station, hear some of the most able speakers in the state discuss the Babcock Amendment, be entertained by band music, witness a baseball game and stunts by a local aviator, and see a parade of the station livestock. As a special inducement, there was a free barbecue dinner at noon, which could very well have been the big drawing card. An estimated 7,000 people were served.

Commenting on the affair the Morris Tribune said that "the baseball game came to a close at 12:45 and the spectators moved to the main campus, where luncheon was served in cafeteria fashion. Juicy beef, potatoes, beans, and buns were put on the plates and coffee served in paper cups. In fact all of the service, even the spoons, was of paper. Many people walked down to the barbecue to see how the oxen were roasted. Cut into four quarters, the animal was hung on chains above huge dripping pans placed on pipes over a blazing fire. When the cells of the meat had been closed, it was put on the pans to finish roasting, thus making a broiled dish, which was very juicy and palatable."

Records show the businessmen of Morris subscribed $1,238.00 and collected $194.28 from concessions for a total of $1,432.28, a sum which was more than adequate to underwrite the expenses of that day.

In 1939 the station instituted a new type of visitation day called, at the time, Hybrid Field Corn Day. Its primary purpose was to acquaint farmers of the area with the performance records and manner of production of the Minnesota hybrids and to show a large number of the commercial hybrids that were listed for sale and recommended to growers in the central part of the Minnesota Corn Belt. Plantings of the Minnesota strains were made to show the finished product or "double cross," and each of the single crosses that were the parents. These days were scheduled in late September or early October so that ripe corn could be shown. Preceding plot visitation a speaking program emphasized hybrid corn production, disease problems, maturity recommendations, rates of planting, and treatments, etc.

Four years later soybeans were included and this annual affair became known as Hybrid Corn and Soybean Day. The program followed the same pattern with matters concerning soybeans included in the discussions. Because of the potential market for soybeans in the Orient, more emphasis was given to the development of a variety or varieties acceptable to this trade.

Another change was made in 1953 with the addition of livestock to the program, now called Livestock, Corn, and Soybean Day. There was a dual purpose in mind: boost attendance by enlarging the scope of inspections and further acquaint the visitors with the livestock department and the projects being carried on. This procedure was discontinued in 1962.

Hay Day, June 12, 1952

Over the years there were many field days, but few of the 2,000 people who were present will forget the $200,000 worth of haying machinery that was put on exhibition and used at the first Hay Day on June 12, 1952. A total of

109 pieces of hay and silage-making machinery and equipment was on display. They were provided by various dealers and distributors and included almost everything in the line of hay and silage-making machinery: mowers, hay choppers, swathers, side delivery rakes, other equipment for hay silage, balers, hay driers, loading devices for baled hay, unloading equipment for hay silage, and a gas-propelled tractor. The machinery was not only on display but was demonstrated by experts eager to show the true worth of each machine. A demonstration of the making of grass silage attracted much attention. Myron Armour, Extension agronomist, acted as marshal for the day and kept the demonstrators moving without too much delay. Making and handling dry hay was the feature of the morning program with particular emphasis given to balers and loaders. The afternoon was devoted exclusively to green hay with the various makes of mowers, choppers, rakes, and silage-making equipment getting the major attention. This Hay Day was sponsored cooperatively by the University of Minnesota and "The Farmer" magazine. Dean H. C. Macy and W. H. Kircher, managing editor of "The Farmer," spoke following the demonstration. A roundtable discussion was held with questions devoted primarily to the working of and utilization of grass silage. Serving on this panel were Dean Macy; T. H. Fenske, associate director of the experiment station; Professor Williams, dairy specialist of the North Dakota Agricultural College; and Ralph Wayne, Extension dairyman. Ray Wolf of radio station KUOM acted as master of ceremonies.

The annual field or visitation days at the West Central Experiment Station followed a pattern that seemed to accomplish most nearly the purposes for which they were intended: providing pertinent information to farmers of western Minnesota and acquainting them with the various phases of experimental work being conducted. Mornings were usually devoted to a plot visitation with visitors divided into small groups.

The picnic lunches on the beautiful campus were always popular. Barbecuing beef for a nominal fee to supplement this noon lunch met with universal approval and has been continued to the present time.

List Of Recommended Varieties By Years

University of Minnesota

	1925	1927	1928	1931	1933	1934
WHEAT						
H.R. Spring	Marquis	Marquillo-Ceres Marquis	Marquillo Marquis Ceres	Marquillo Marquis Ceres	Marquillo Marquis Ceres	Ceres Thatcher Marquis
Durum	Mindum	Mindum	Mindum	Mindum	Mindum	Mindum
Winter Wheat	Minturki	Minturki	Minturki	Minturki	Minturki	Minturki
OATS	Gopher Victory Minota Imp. Ligowa	Gopher Victory Minota Imp. Ligowa Anthony	Gopher Victory Minota Imp. Ligowa Anthony	Gopher Iogold Rainbow Minrus Anthony	Gopher Iogold Rainbow Minrus Anthony	Gopher Iogold Minrus Rusota Anthony Dak. Hulless
BARLEY	Velvet Imp. Manchuria Minsturdi Suansota	Velvet Imp. Manchuria Minsturdi Peatland	Velvet Imp. Manchuria Minsturdi Peatland	Velvet-Glabron Imp. Manchuria Trebi-Minsturdi Suansota Peatland	Velvet-Glabron Imp. Manchuria Trebi-Minsturdi Suansota Peatland	Velvet-Glabron Imp. Manchuria Wis.. 38-Trebi Peatland
FLAX	Winona Chippewa Redwing N.D. 114	Winona Chippewa Redwing N.D. 114	Winona Chippewa Redwing N.D. 114 Linota	Buda Redwing Bison	Buda Redwing Bison	Buda Redwing Bison
RYE	Swedish Rosen	Swedish Emerald Rosen	Swedish Emerald Rosen	Dakold Rosen	Dakold Rosen	Dakold Rosen
SOYBEANS	Minsoy Wis. Black Chestnut Habaro Elton Manchu Soysota	Minsoy Wis. Black Chestnut Habaro Elton Manchu Soysota	Minsoy Wis. Black Chestnut Habaro Elton Manchu Soysota	Minsoy Wis. Black Chestnut Manchu Habaro	Minsoy Wis. Black Chestnut Manchu Habaro	Wis.. Black Chestnut Manchu Habaro
ALFALFA						Grimm Ladak

	1936	1939	1941	1943	1945	1947
WHEAT						
H.R. Spring	Ceres Thatcher	Thatcher	Thatcher Rival	Newthatch-Rival Pilot Regent	Newthatch Mida-Rival Pilot-Regent	Newthatch Mida-Regent Pilot-Rival
Durum	Mindum	Mindum	Mindum	Mindum-Carlton	Mindum-Carlton	Mindum-Carlton
Winter Wheat	Minturki	Minturki	Marmin-Minturki	Marmin-Minturki	Marmin-Minturki	Minturki-Minter
OATS	Gopher Iogold Minrus Rusota Anthony Dak. Hulless	Gopher Iogold Minrus Rusota Dak. Hulless	Gopher Iogold Nakota Minrus Rusota Vanguard-Anthony	Tama Vicland Bonda Mindo	Tama Vicland Bonda Mindo	Zephyr Clinton Bonda Mindo Andrew
BARLEY	Glabron Velvet Wis. 38 Imp. Manchuria Peatland	Wis. 38 Velvet Imp. Manchuria Peatland Glabron	Wis. 38 Velvet Imp. Manchuria Peatland	Wis. 38 Peatland	Wis. 38 Mars Peatland	Wis. 38 Kindred Mars Peatland
FLAX	Buda Bison Redwing	Buda Bison Redwing	Buda Bison Redwing	Redwing Koto-Buda Dakold Biwing Crystal	Biwing Koto Crystal Buda Redwing	Dakold Koto Crystal Minerva Redwing
RYE	Dakold Rosen	Dakold Rosen	Dakold Rosen Emerald	Dakold Rosen Emerald	Dakold Imperial Emerald-Rosen	Dakold Imperial Emerald
SOYBEANS	Minsoy Wis. Black Chestnut Manchu Habaro	Minsoy Wis. Black Habaro Manchu	Minsoy Wis. Black Habaro Manchu	Minsoy Wis. Black Habaro Manchu Muckden Richland	Minsoy Manchu Habaro Mandarin (Ott.) Kabott Habaro	Manchu Habaro Ott. Mandarin Kabott Flambeau
ALFALFA	Grimm Ladak	Grimm Ladak	Grimm Ladak	Grimm Ladak	Grimm Ladak Ranger	Grimm Ladak Ranger

	1949	1952	1953	1954	1955	1956
WHEAT						
H. R. Spring	Mida Pilot Rival	Mida-Lee Rushmore Rival	Mida-Lee Rushmore Rival	Lee-Mida Rushmore	Lee-Rushmore Selkirk	Lee Selkirk
Durum	Carlton-Mindum	Carlton-Mindum-Stewart	Carleton-Mindum Stewart	Mindum-Carleton Stewart	Carleton-Mindum Stewart	Langdon-Ramsey-Sentry
Winter Wheat	Minturki-Minter	Minturki-Minter	Minturki-Minter	Minturki-Minter	Minturki-Minter	Minturki-Minter
OATS	Bonda Clinton Mindo Andrew Zephyr	Bonda Clinton Mindo Andrew Shelby-James Ajax-Branch	Bonda Clinton Mindo-Clintafe Andrew Shelby-James Ajax-Branch	Bonda-Shelby Clintafe-Clinton Mindo-James Andrew Mo-0-205 Ajax-Branch	Bonda-Clintafe Clinton Mindo-James Andrew Mo-0-205 Ajax-Branch	Sauk Rodney Minland-Ajax Andrew Mo-0-205 Branch-Garry
BARLEY	Wis. 38 Kindred "L" Mars Peatland Moore	Kindred Moore Vantage Peatland	Kindred Montcalm Vantage Peatland	Kindred Montcalm Vantage Peatland	Kindred Montcalm Peatland Vantage	Kindred Montcalm Peatland Vantage
FLAX	Koto Dakota Minerva Crystal Redwing	Koto Redwood Minerva B-5128 Marine-Redwing	Koto-Redwing Redwood Minerva B-5128 Marine	Redwood B-5128 Marine	Redwood B-5128 Marine	Redwood B-5128 Marine
RYE	Dakold Imperial Emerald	Imperial Emerald	Imperial Emerald	Caribou Imperial Emerald	Caribou Adams	Caribou Adams
SOYBEANS	Habaro Manchu Ott. Mandarin Flambeau Kabott Richland	Capital Monroe Ott. Mandarin Flambeau Blackhawk Renville	Capital Ott. Mandarin Flambeau Blackhawk Renville	Capital Ott. Mandarin Flambeau Blackhawk Renville	Capital Norchief Ott. Mandarin Flambeau Blackhawk Renville Chippewa	Capital Norchief-Grant Ott. Mandarin Flambeau Blackhawk Renville Chippewa Harosoy
ALFALFA	Grimm Ladak Ranger	Ladak Ranger	Ladak Ranger Harragansett	Ladak Ranger Harragansett	Vernal Ladak Harragansett Ranger	Vernal Ladak Harragansett Ranger

	1957	1958	1959	1960	1961	1962
WHEAT						
H.R. Spring	Lee Selkirk	Lee Selkirk	Lee Selkirk	Lee Selkirk	Lee-Pembina Selkirk	Justin-Selkirk Pembina
Durum	Langdon Ramsey	Langdon Ramsey	Langdon Ramsey	Langdon-Wells Lakota	Langdon-Wells Lakota	Langdon Lakota-Wells
Winter Wheat	Minturki-Minter	Minturki-Minter	Minter	Minter	Minter	Minter
OATS	Sauk Rodney Minland Ajax Andrew Branch Garry	Sauk Rodney Minland Ajax Andrew-Garry Minhafer Branch	Garry Rodney Burnett Ajax Andrew Minhafer Minton	Garry Rodney Burnett Ajax Andrew Minhafer Minton	Garry Rodney Burnett Ajax-Goodfield Andrew Minhafer Minton	Garry Rodney Burnett Ajax-Goodfield Andrew Minhafer Portage
BARLEY	Kindred Montcalm Peatland Vantage Traill	Kindred Forrest Peatland Vantage Traill	Kindred Forrest Traill	Kindred Parkland Traill	Kindred Parkland Traill	Kindred Larker Parkland Trophy Traill
FLAX	Redwood B-5128 Marine	Redwood B-5128 Marine	Bolley Redwood B-5128 Marine Arny	Bolley Redwood B-5128 Marine Arny	Bolley Redwood B-5128 Marine 62 Arny	Bolley Redwood B-5128 Marine 62 Arny-Windom
RYE	Adams Caribou	Adams Caribou	Adams Caribou Elk	Adams Caribou Elk	Adams Caribou Elk	Adams Caribou Elk
SOYBEANS	Capital Norchief Ott. Mandarin Flambeau Blackhawk Renville-Acme Harosoy Grant-Chippewa	Capital Norchief Ott. Mandarin Flambeau Blackhawk Renville-Acme Harosoy-Renville Grant-Chippewa	Capital Norchief Ott. Mandarin Flambeau Grant-Comet Chippewa Harosoy	Capital-Merit Norchief Ott. Mandarin Flambeau Grant-Comet Chippewa Harosoy Acme	Merit Norchief Ott. Mandarin Flambeau Grant-Comet Lindarin Harosoy-Acme Chippewa	Merit Norchief Acme-Ott. Mandarin Flambeau Comet-Grant Lindarin Harosoy Chippewa
ALFALFA	Ladak Harragansett Ranger Vernal	Ranger Vernal	Ranger Vernal	Ranger Vernal	Ranger Vernal	Ranger Vernal

	1963	1964
WHEAT		
H. R. Spring	Crim-Justin	Crim-Justin
	Pembina-Selkirk	Pembina-Selkirk
Durum	Lakota	Lakota
	Wells-Langdon	Wells
Winter Wheat	Minter	Minter
OATS	Garry-Dodge	Garry
	Rodney	Rodney
	Burnett	Dodge
	Ajax-Goodfield	Goodfield
	Andrew	Garland
	Minhafer	Minhafer
	Portage	Portage
BARLEY	Kindred	
	Larker	Larker
	Parkland	Parkland
	Trophy	Trophy
	Traill	
FLAX	Bolley	Bolley
	Redwood	Redwood
	B-5128	B-5128
	Summitt	Summitt
	Windom	Windom
RYE	Adams	Adams
	Caribou	Caribou
	Elk	Elk
SOYBEANS	Acme	Acme-Ott. Mandarin
	Flambeau	Flambeau
	Comet	A-100
	Grant-Merit	Grant-Merit
	Lindarin	Lindarin
	Harosoy	Harosoy
	Chippewa	Chippewa
	Ott. Mandarin	Chippewa 64
ALFALFA	Ranger	Ranger
	Vernal	Vernal

Superintendents, West Central Experiment Station

E. C. Higbie
1910-1919

P. E. Miller
1919-1938

T. H. Fenske
1938-1947

A. W. Edson
1947-1958

H. G. Croom
1958-1959

R. A. Briggs
1959-1961

R. E. Smith
1961-

Agronomy

1911 - 1916	P. E. Miller
1917	Theodore Odland
1918 - 1956	Roy O. Bridgford
1956 -	Roy L. Thompson

Assistant

1917 - 1920	Otto Swenson
1920 - 1921	Silas Hansen
1921 - 1928	Jens Jensen
1929 - 1930	Julius Jellum
1931 - 1934	Nels Olmeim
1935 -	Walter Barz

Animal Husbandry

1911	G. R. Ingalls
1912	R. H. Giberson
1913	R. H. Giberson & Alva Wilson
1914	Alva Wilson
1915 - 1955	Phillip S. Jordan
1955 -	Harley Hanke

Assistant

1925	Leslie Stock - Herdsman
1926	Earl Robinson - Herdsman
1927	Earl Robinson - Herdsman
1928 - 1930	Theodore Grotjohn-Herdsman
1931 -	Walter Hokanson - Herdsman
1937 - 1948	Nick Frey - Herdsman
1948	Glendon Rose - Herdsman
1949	Harry Peterson - Herdsman

Superintendent of Buildings

1911 - 1925	O. O. Bye
1926 - 1930	A. B. Rolfe
1931 - 1948	A. C. Heine

Farm Foreman

1911 - 1914	Ernest Moldenhauer
1915 - 1916	- - - - - - -
1917 - 1918	Gerhard Quitney
1919 - 1923	Chris Jensen
1923 - 1927	Jens Jensen
1927 - 1962	Oscar Beckstrom
1962 -	Elmer Madison

Dairy Husbandry

1964 -	Vernon G. Pursel

Soil Science

1963	Samuel D. Evans

Agricultural Engineer

1916 - 1948	A. C. Heine
1949 -	L. K. Lindor

Horticulture

1914	Robert Wilson - Forestry
1915	Robert Wilson - Forestry
1916 - 1946	John A. Anderson
1946 - 1947	Allen W. Edson
1948	Wesley H. Gray

Assistant

1925 - 1927	Alfred H. Butlers
1928 - 1929	Gust Peterson
1930 - 1931	Lacey Darnell
1946 - 1947	Theodore S. Long
1948 - 1960	Theodore S. Long
1960 -	Fritz Bowen

Poultry

1912	S. Irvin Snortum
1914	Alva Wilson
1922 - 1945	Allen W. Edson
1945 - 1946	Clarence Hemming
1946 - 1959	H. G. Croom

Assistant

1929 - 1951	Art Schiller
1951 - 1955	Emil Treischel
1955 - 1960	Marshall Beebe

Presidents, University of Minnesota

1911 - 1918	George Edgar Vincent	Ph. D. - LL. D.
1919 - 1920	Marion LeRoy Burton	Ph. D. - D. D. - LL. D.
1921 - 1939	Lotus D. Coffman	Ph. D.
1940	Guy Stanton Ford	Ph. D. Litt. D. - LL. D. - L. H. D.
1941 - 1945	Walter C. Coffey	M. S. - LL. D.
1946 - 1959	James C. Morrill	B. A. - LL. D.
1959 -	O. Meredith Wilson	Ph. D.

Dean and Director, Department of Agriculture

1911 - 1918	Albert F. Woods	M. A.
1919 - 1927	Roscoe W. Thatcher	M. A.
1922 - 1940	Walter C. Coffey	M. S. - LL. D.
1941 - 1952	Clyde H. Bailey	Ph. D.
1953 - 1963	Harold Macy	Ph. D.

Dean, Institute of Agriculture

1963 -	Sherwood O. Berg	Ph. D.

Director Of The Agricultural Experiment Station - University of Minnesota

1954 -	H. J. Sloan	Ph. D.