

Northwest School News

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VOLUME XXIX

CROOKSTON, MINNESOTA, NOVEMBER, 1945

NUMBER 8

50th Anniversary - Northwest Experiment Station, 1895-1945 Parents' Day - November 17

Anniversary and Parents' Day Program Of Valley- Wide Interest

Six hundred parents of Northwest School students are expected as guests for the annual Parents' Day program and dinner to be held at the Northwest School on Saturday, November 17. A program for the entire day has been planned for the parents and others who will be at the school for the observance of the 50th anniversary of the Northwest Experiment Station.

Registration of parents will start at 10:00 a. m. in the Kiehle building and continue there until 11:30 a. m.; the registration booth will be moved to the bookstone in the Dining Hall at 11:30 a. m. and continue there until 1:15 p. m. After registering, the parents are invited to visit the Home Project Show in the gymnasium and all school buildings. Student guides have been appointed to conduct the visitors through the buildings. The officers of the Northwest School Parents' Association, the county directors and special Association committees will meet in the school library at 10:45 a. m. The president of the Parents' Association, Oscar Thureen, has called the annual meeting of the association for 1:30 p. m. in the school auditorium. The Parents' Day dinner will be served in the school dining hall beginning at 11:30 a. m. and continue until 1:15 p. m.

The Parents' Day and Anniversary program will be held in the school auditorium at 2:00 p. m. Music for the program will be provided by the school band, vocal groups and instrumental soloist. The student part of the program will also feature a style revue of garments made by girls in home sewing projects, a resume of boys' home project work, and a short one-act play. The observance of the fiftieth anniversary

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The Northwest Experiment Station Today

The program, featuring the 50th anniversary of the founding of the Northwest Experiment Station, to be held on November 17, can depict only a fragmentary picture of the progress made in developing an experiment station. The prestige and character of the Northwest Experiment Station has been dependent upon not only the record of experimental work but on the vision of the founders and the leadership of the superintendents, members of the experiment station staff and employees. The value of the experimental work for the past fifty years can be summarized and evaluated; however, the contributions made by the superintendents and their co-workers through this period in the development of a productive agriculture cannot be properly evaluated.

A brief summarization of the progress in the various phases of the experimental work carried on by the Northwest Experiment Station, during the fifty years, has been compiled for the Anniversary issue of the "Northwest School News." The information has been gathered from the reports of the superintendents, the directors of the Minnesota Experiment Station,

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Homecoming A Success With Large Attendance

Miss Geneva Iverson of Goodridge was crowned Queen of Homecoming at the Homecoming dance and party at the Northwest School on Saturday evening, October 27. The queen was crowned by the 1944 queen, Florence Urbaniak of Argyle. Colleen Skeie of Winger was elected as maid of honor. The other nominees for queen served as attendants to the queen; they were Ellen Johnson of Lancaster, Frances Klein of Warroad, Iris Sinclair of Stephen, and Lillian Qualley of Mentor.

Homecoming at the school was declared a success with more than two hundred alumni and former students present for the activities of the day. Homecoming festivities began on Friday evening with the traditional torchlight parade, bonfire and pepfest.

The Homecoming assembly was held in the school auditorium on Saturday morning with Superintendent T. M. McCall giving the address of welcome. Members of the football and cross-country teams were introduced by coaches H. Lysaker and E. F. Bennett. An original skit "Homecoming" was presented by members of the dramatics class under the direction of Mrs. Lila Hage and Miss Jeanette Peterson of the English department. The Homecoming banquet was

served in the Dining Hall at 6:00 p. m. with the football team from the Walsh County Agricultural School, Park River, N. D., and the cross-country team from West Central School of Morris as guests. Superintendent McCall served as toastmaster and speakers responding to toasts included coaches H. Lysaker and E. F. Bennett of Crookston, coach Joe Teie of the Park River team and coach Allen Edson of the Morris team. Team captains from the football and cross-country teams res-

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Aerial View of Northwest School and Station, 1945

COMING EVENTS

Nov. 22—Thanksgiving
 Dec. 15—Interclass Song Contest
 Dec. 16—Christmas Play
 Dec. 19—Awards Assembly
 Dec. 21—Christmas Vacation Begins
 Jan. 7—Winter Term Opens

Northwest School Briefs

***News Regarding Northwest School Alumni and Former Students:

***New Address: S/Sgt. Arthur Gordon, 8th Malaria Control, A.P.O. 321, c/o Postmaster, San Francisco, California.

***T/Sgt. Harlan C. Ellinger of Crookston was discharged from the army on October 16 under the point system. He was discharged from Hunter Field, Ga., separation center.

***New Address: Lillian M. Jensen, S2/C, U. S. Naval Air Station, WAVE Barracks, Atlantic City, N.J.

***PFC C. Rishton Bedard of Northcote was discharged from the army on October 15 under the point system. He is employed at Hallock, Minnesota.

***New Address: Ensign Eleanor Torkelson (N.C.) U.S.N.R., U. S. Naval Hospital, Ft. Eustis, Virginia.

***Miss Ona Scheidler, a former instructor at the Northwest School, is teaching in the Konawaena School, Kealahou, Hawaii.

***Mr. and Mrs. Kenneth Flom (Grace Warne) are living at 510 No. Greenwood, Austin, Minnesota.

***New Address: Lt. (jg) Virginia Bede, U.S.N.A., 153 E. Ridge Lane, Lake Forrest, Illinois.

***Lt. Robert L. Sunderland of Crookston was recently discharged from the army under the point system.

***Marion A. Hagen has recently been appointed by the American Red Cross as a Staff Assistant for overseas duty. Her address is: Marion A. Hagen 66056, Personnel Training Section, National Hqtrs., American Red Cross, Washington (13) D. C.

***New Address: Robert O. Parnow S 1/C (AM), Hedron 14-2, FAW 14, box 5, c/o Fleet Postoffice, San Francisco, California.

***2nd Lt. Glen Nansen received an honorable discharge from the army on October 22. He will attend the University of Minnesota, Minneapolis.

***Sgt. Lawrence E. Simonson of McIntosh received his discharge under the point system on September 7.

***Lt. Lydia Dahlen, a former instructor and school nurse at the Northwest School, has returned to the United States after serving the past 33 months in New Hebrides, New Caledonia, and Hawaii with the army nurses corps. Her address now: Hdq. Schick General Hospital, Clinton, Iowa.

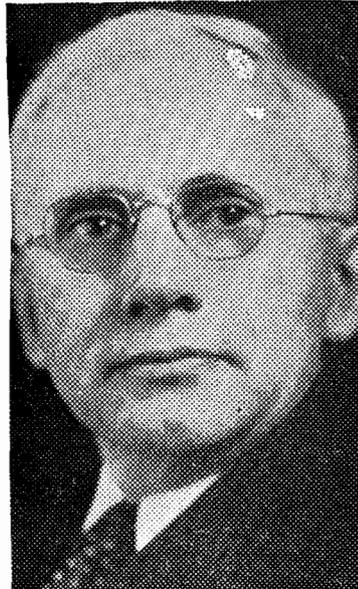
***Irene Pulkrabek of Angus is a student at the University of North Dakota, Grand Forks, and was recently pledged to Delta Zeta Sorority.

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Dean Bailey To Be Anniversary Program Speaker

Dr. C. H. Bailey, dean and director of the Minnesota College of Agriculture and Experiment Station, University of Minnesota, will be one of the speakers on the program for the observance of the 50th anniversary of the Northwest Experiment Station.

Dr. Bailey assumed his present position as Dean and Director of the Minnesota Experiment Station on July 1, 1941. Dean Bailey, as a veteran scientist in the field of biochemistry, established and maintained the leadership of the Minnesota Station in the milling and baking tests of wheat flour and the restoration of essential vitamins and minerals to that product. He has a broad and sympathetic understanding of problems confronting the Agricultural College and Experiment Station and is recognized as a leader in his field.



DR. C. H. BAILEY

THE NORTHWEST EXPERIMENT STATION TODAY

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and the personal observations made by the present superintendent over a period of thirty-four years of service.

SUPERINTENDENTS OF THE EXPERIMENT STATION

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THOMAS M. McCALL—1937-

T. M. McCall, appointed superintendent in 1937, has been a member of the School and Experiment Station staff since 1911. Superintendent McCall, as horticulturist until 1937, was responsible for landscape plantings on the School and Station grounds and experimental work with potatoes, sugar beets, vegetable and fruit crops. In addition to other duties, Mr. McCall served as field manager at the Station from 1919 to 1926, and acting superintendent during Dr. Dowell's absence in 1933-34.

NORTHWEST SCHOOL BRIEFS

(Continued from Col. 1)

MARRIAGES

***Miss Edna Koppang of Climax to Boyd Knutson of Fisher on Thursday evening, September 6. They will make their home near Fisher, Minnesota.

***Miss Edna Paulsrud of Nielsville to Clarence H. Sargent of Crookston at Nielsville on October 19. They will make their home at Crookston, Minnesota.

***Miss Esther Norum (Petty Officer MaM 3/C) to Petty Officer Jack Allen Gee at the Navy Chapel, Treasure Island, California, on August 4.

***Miss Irene Olson of Halstad to Navy Lt. Donald L. Coffelt of Ponca City, Oklahoma, on Thursday, October 25, at Halstad, Minnesota.

***Miss Evelyn Webster of Richmond, California, to Albert J. Adler, formerly of Waubun, on October 25.

***Miss Lorraine Newell of East Grand Forks to Donald W. Geddes of East Grand Forks on October 20.

***Miss Edith Rose Sandell to Marvin Nabben on Saturday, November 3, at Ramsey, New Jersey.

DEATH

***Mrs. David Skarp (Olga Spjut, class of 1918), on September 23 at Karlstad, Minnesota.

ANNIVERSARY AND PARENTS' DAY PROGRAM

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of the founding of the Northwest Station will be made by addresses of Dean C. H. Bailey, dean and director of the Minnesota Experiment Station, Dr. A. A. Dowell, former superintendent, and Superintendent T. M. McCall.

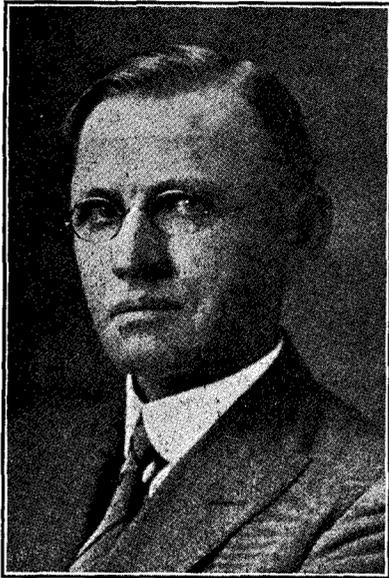
The afternoon program will be completed with the get-acquainted and coffee hour at 3:45 p. m. The Parents' Day program will be concluded with the showing of a feature film at 7:30 p. m.

HOMECOMING A SUCCESS, WITH LARGE ATTENDANCE

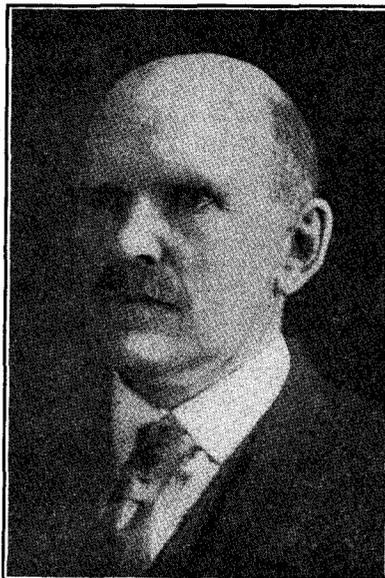
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ponded to toasts. Alumni service men responding to toasts included Cyril Sorrels of Williams, Fred Cook of Warroad and George Roisum of Bagley; Mrs. Olive Heegard Rueth of Westfield, New Jersey, spoke for the alumni girls.

Homecoming Day was concluded with the dance in the gymnasium and a party in the Aggie Inn. Four "recognition awards" were made to alumni of the Northwest School at the Homecoming party. Mr. and Mrs. Clarence Sargent (Edna Paulsrud) of Crookston were awarded the "red oil can" for the most recently married couple (wedding date of October 19). The prize to the alumnus from the earliest graduating class was awarded to Darragh Geddes, '14, of East Grand Forks; Mrs. Geddes ranked second as a graduate of the class of 1919. The award to the alumnus with the longest military service record was made to T/Sgt. Fred Cook of Baudette for forty-six months of service. The prize to the alumnus coming the greatest distance was awarded to Mrs. Olive Heegard Rueth of Westfield, New Jersey.



T. A. HOVERSTAD
Superintendent 1895-1905



WM. ROBERTSON
Superintendent 1905-10



C. G. SELVIG
Superintendent 1910-27

Superintendents Of The Experiment Station, 1895-1945

TORGER A. HOVERSTAD
(deceased), 1895-1905:

T. A. Hoverstad inaugurated the experimental work at the Northwest Station in 1895. Mr. Hoverstad soon saw that trees were a necessity for prairie farms and planted the windbreaks in 1896-97 which now shelter the campus area. He grew in comparative plots all new and recommended varieties of crops deemed suitable for the Red River Valley. Mr. Hoverstad did a great deal of agricultural extension work in the district, organized the Red River Valley Dairymen's Association and worked for the establishment of a School of Agriculture.



A. A. DOWELL
Superintendent 1927-37

WILLIAM ROBERTSON
(deceased), 1905 - 1910:

Professor William Robertson came as the first superintendent of the combined Experiment Station and School of Agriculture. The five buildings constructed during Professor Robertson's administration include Home Economics, Stephens Hall, Owen Hall, Kiehle building, and a girls' dormitory later named in his honor. Professor Robertson secured a complete network of surface drainage ditches for the farm which, together with some till drainage, removed the water hazard to field experimental work.

CONRAD G. SELVIG—1910-1927:

Under the leadership of C. G. Selvig, the School made its most rapid growth in both enrollment and expansion of physical equipment. Accomplishments under the administration of C. G. Selvig include: adoption of a permanent plan of landscape development for school campus, construction of Hill building, Senior Hall, Dining Hall, Health Service, Animal Products, elevator and seed storage, beef cattle barn, a sheep barn, cattle feeding shed, cottages and apartments for full-time staff members and employees. Mr. Selvig furnished the leadership for the founding of the Red River Valley Winter Shows and Northwest School Farmers' Week and organized the Red River Valley Development and Livestock Associations and served as president of both organizations and the Dairymen's Association as well. Mr. Selvig left the Northwest School and Station to serve as congressman from his district. His present address is Santa Monica, California.

AUSTIN A. DOWELL
—1927-1937:

Dr. A. A. Dowell, a capable and efficient administrator, teacher, and research worker, successfully guided the Northwest School and Station through

the depression years and saw the School enrollment climb to the four hundred mark. He served as president of the Red River Valley Livestock and Dairymen's Associations and the Winter Shows Board of Managers. Dr. Dowell, while on leave in 1933-34, did special research for the United States Department of Agriculture in the field of livestock marketing.

Improvement to the physical plant under Dr. Dowell's administration include: a new sheep barn, gymnasium and swimming pool, remodeling of auditorium, library, Stephens and Robertson Halls and Home Economics building.

Dr. Dowell is now a professor in the Department of Agricultural Economics, University Farm, St. Paul.

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T. M. McCALL
Superintendent 1937-

Northwest School News

Issued by
THE UNIVERSITY OF MINNESOTA
NORTHWEST SCHOOL OF
AGRICULTURE
T. M. McCall, Superintendent
OFFICE
Northwest Experiment Station
Crookston, Minnesota
This publication issued nine times a year,
monthly, October through March; bi-
monthly, April through September.

Windbreak and Landscape Plantings

The Experiment Station land in 1895 was an open, poorly-drained treeless prairie. One of the first tasks of Superintendent T. A. Hoverstad was to get trees planted. A comprehensive windbreak and shelterbelt program was drawn up, and the first of several thousand trees were planted in 1896. Blocks of trees such as Boxelder, common Cottonwood, Green Ash and American elm were planted with the species in pure stands and in various combinations. The 1896 planting area began near the west line of the present campus cottages and extended west to the present Health Service building. The 1897 planting was begun at the Health Service and continued in the line of the present windbreak west to the corner of the section and thence south. The trees planted in 1897 consisted of Green Ash, Cottonwood, White and Paper Birch, Box Elder, White Elm, White and Golden Willow. One block of Golden Willow was interplanted with Red Cedar and a number of White Cedar were interplanted in two or more blocks. The species planted in 1897 were also planted alone and in various combinations. Superintendent Hoverstad reported that the trees in the 1897 planting were "mudded in" and that the workmen had to wear high boots due to the high water level. Other evergreens such as Colorado, Blue, Black Hills and White Spruce, Scotch Pine and Balsam fir were interplanted in the rows of the 1896 planting. Many of the large Colorado Blue spruce, Black Hills and White spruce, now standing on the campus, were transplanted to their present locations in the years of 1912-13-14.

A good survival of trees was obtained from the 1896-97 plantings; however, the trees did not make normal growth until surface drainage was provided in 1907-08. All trees planted during the early years did not survive. Many trees failed on the alkali spots and Superintendent Hoverstad reported that some 10,000 young White and Norway pine and Spruce transplants, planted as a cooperative project with the United States Department of Agriculture, failed.

Another planting of interest was a block of some 1200 Hackberry trees which were gathered as young seedlings in 1901 from the Estenson farm near Climax. The Hackberry trees were transplanted from the nursery block in 1912-15; a few of the trees were left in their original locations and

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NORTHWEST EXPERIMENT STATION 1895-1945

LANDHOLDINGS

1895, 476.61 acres; 1945, 900.1 acres
The original tract of land used by the Northwest Experiment Station consisted of 476.61 acres. Permission to use the land for experimental purpose was granted by the St. Paul and Pacific Railway, a part of the Great Northern Railway system. A conditional deed to the property, with an option to purchase, was given by the Great Northern Railway Company in 1903. The tract consisted of the Northwest, Northeast and Southeast quarter sections of Section 19, Crookston township, Polk county, less railroad right-of-way. The acreage was increased in 1924 by the addition of 66 acres from the east one-half of the Southwest quarter of Section 19. The remaining 68 acres, held on conditional deed by the Red River Valley Livestock Association for a Fair Grounds, was purchased by the University Board of Regents in 1939, at which time clear title to the entire section was given the University by the Great Northern Railway. The 300 acres, East half of Section 24 of Lowell township, across the highway from the Experiment Station, was acquired by purchase in 1937.

Drainage of the Experiment Station Land

Land drainage, since the founding of the Experiment Station, has been a problem of paramount importance. The money spent for drainage by the University, through Legislative appropriations and Support funds, has been justified in that the lay of the land and the slow natural drainage conditions on the Experiment Station land are typical of the heavy soil areas of the entire Red River Valley. The annual rainfall of the area, approximately twenty inches, is no more than adequate for good crop production; however, the uneven distribution of the rainfall at planting and harvest has been the cause of serious crop losses in the area.

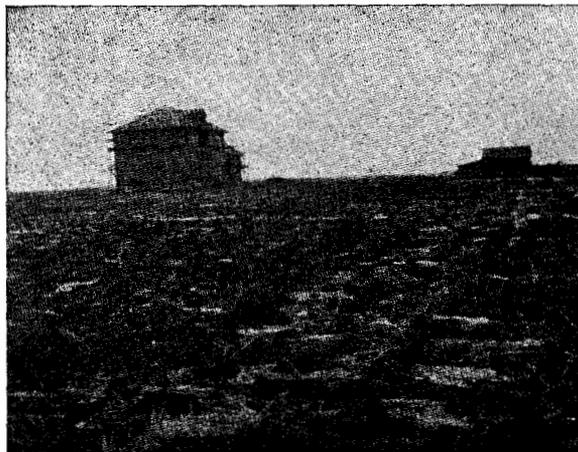
T. A. Hoverstad saw that the drainage problem was, first, to prevent water

from the drainage basin from flowing over the land; and, second, to secure surface drainage to take off excess water that fell on the land. The drainage problem was later defined by former Superintendent Wm. Robertson and John T. Stewart, United States drainage engineer, in bulletin No. 110 of the University of Minnesota, as follows: "An examination of the existing conditions showed the farm to lie at the lowest part of a drainage basin. The surface rising to the east and north causes the drainage of that area to run down on the farm, being held there by the ridge which follows the north side of the Red Lake River. The only material outlet for the farm is a shallow coulee which runs to the northwest, but not having sufficient depth to prevent the collection of water."

The first drainage to the farm was provided by the city of Crookston in which \$2,000 was used to construct a roadside ditch to the southeast corner of the present farm which cut through the ridge which parallels the Red Lake river. This open ditch drained only the surplus water from a small area of the farm. A storm sewer tile was later put in the ditch in Crookston and the open part of the ditch was filled. A capstan ditch was constructed in 1903 which cut across the center line of the section from east to west following a natural contour which carried the water in a northwesterly direction to a coulee which was later to become the outlet course of county ditch No. 60.

Highways on the north and east were built up as barriers against the drainage waters from those directions. County ditch No. 60, constructed in 1907, gave the Experiment Station an outlet at the northwest corner of the farm to a depth of 7 feet. The whole surface and tile drainage plan for the Experiment Station, completed in 1909, drains through the outlet into county ditch No. 60. A comprehensive plan of surface and tile drains, supplemented through the years with additional shallow sur-

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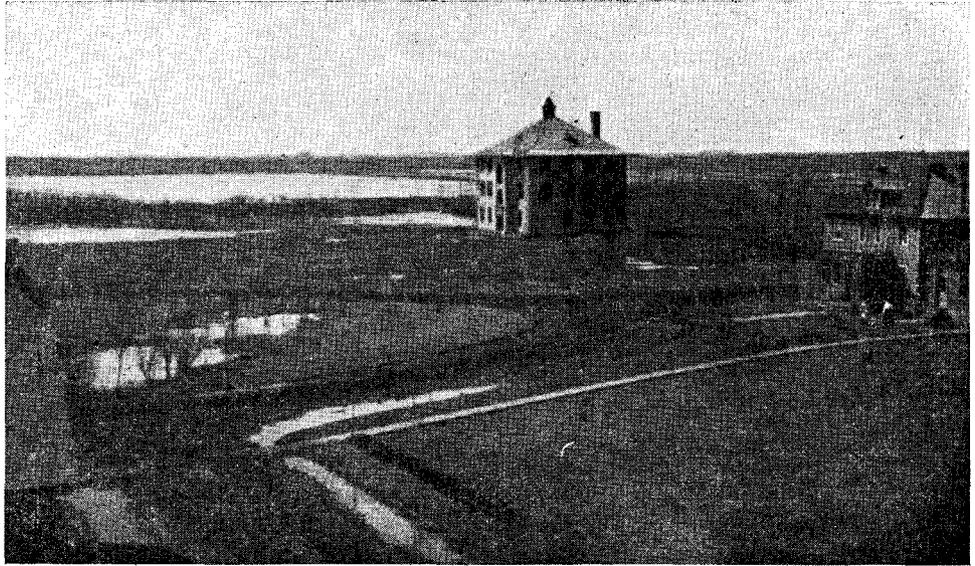
N. W. Experiment Station, 1895

Pictured is the first house constructed on the Northwest Experiment Station, 1895. This house served as the residence for the first superintendent. Following the establishment of the school, the second floor and attic was used as a dormitory for girls until Robertson Hall was completed. The entire area of the Experiment Station was treeless; shelter belts were planted north and west of the farmhouse.

Home Economics Building in 1906

This building first served as a complete school unit with classrooms and superintendent's office on the second floor, boys' dormitory on third floor, and dining room, kitchen and home economics laboratory on the first floor. Girl students lived in the farm house. Administrative offices remained in the building until the Kiehle Building was completed in 1910. This building, through the years, has been remodelled twice and is now a modern home economics building with a six-room Home Management apartment.

The dormitory facilities of the school have been expanded since 1906 to include two dormitories for boys, one for girls and an additional new dormitory for girls to be constructed in 1946.



NORTHWEST EXPERIMENT STATION

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face ditches, has through the years given fairly adequate drainage to farm fields. The ditches, however, due to silting in during the years 1909 to 1944, checked the effectiveness of the tile drains. A ditch cleaning and lowering project has now been approved for completion in 1945. This last project contemplates cleaning and lowering the original ditch to take advantage of increased depth to be obtained in the cleaning and lowering of county ditch No. 60 in 1946.

Field Crop Investigations, 1895-1944

The major work at the Experiment Station since its founding in 1895 has been done in variety, culture and fertilizer testing of farm crops. The year the Experiment Station was established was a "bumper crop" year for the Red River Valley. Superintendent T. A. Hoverstad reported, "Travelling in the territory in 1895, I saw only a part of a great ocean of wheat. I never saw a finer crop of grain. The crop was so large the railroads hauled wheat as fast as they could. Elevators were filled and piles of grain were made in the streets of the towns and villages. This was the last bumper crop of grain for many years."

The first experimental grain plots in 1896 were 4'x4'. A large number of varieties were tested that year. From this preliminary study, crop rotations were planned for the farm fields.

In the wheat variety trials, it was soon found that the improved selections and varieties from the Minnesota Station proved superior to the commonly grown varieties. Minn. No. 163, a Fife selection, proved superior to the ordinary Fife, and Hayes bluestem Minn. No. 169 later proved superior to the Minn. No. 163. The parade of the newer varieties of farm crops through the variety tests has been a good demonstration of the great progress made in the science

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of crop breeding. In wheats, the Minnesota numbers 163 and 169 and many hybrids of Fife and bluestem dominated the variety trials from 1910 to 1920. Marquis, introduced at the Station in 1912, soon achieved popularity and in one decade practically replaced Minn. No. 163, Minn. No. 169 and Velvet Chaff as a wheat for the Red River Valley. Kubanka and Minnesota No. 951 (Mindum), of the durum wheats, were introduced into the variety trials in 1912. Wheat varieties bred for rust resistance appeared in the tests in 1920, with the North Dakota variety, Kota, followed later by Ceres in 1926 and Minnesota production Marquillo in 1929, and Thatcher in 1934. Since 1934, many new and now well-known varieties of wheat in both Hard Spring and Durum have been introduced.

Varietal introductions of oats, barley and flax, through the years, have demonstrated the value of the crops breeding program which is in progress at the state and federal Experiment Stations.

The corn work began at the Station with variety tests in 1898, with varieties reaching 10 to 20 per cent maturity. In 1899, varieties such as Sweet Nose flint and Pride of the North reached 95 per cent maturity. Minnesota No. 13 appeared in the tests first in 1897. Minnesota No. 13 and Minnesota No. 23 continued as standard varieties together with early flint corn varieties for some three decades. Corn improvement work with Northwestern Dent at the Northwest Station began in 1919. The variety was standardized in color and type through ear to row selections and was distributed as the Crookston strain of Northwestern Dent until the advent of the new corn hybrids in 1941-42. The testing work with new corn hybrids and open pollinated varieties is being continued.

Fertilizer Trials

Comprehensive trials of commercial fertilizing materials alone and in combination were started in 1914. The fertilizer trials on farm crops and potatoes

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were carried on in cooperation with the Division of Soils of the Central Experiment Station. Tests on rates of manuring and different application rates of low-grade fertilizers, testing of fertilizing materials, alone and in combination, in three and four-year rotations were conducted for three and four rotation cycles.

The early work with commercial fertilizers indicated that no profitable return could be expected from potash fertilizers on the heavy soils and that most profitable returns from phosphate fertilizers came from alfalfa, sugar beets and potatoes. Later work on plots after years of cropping indicated the value of potash in the fertilizer application and that most crops respond profitably to applications of phosphate fertilizers.

Grasses and Legumes

One of the early observations made by Superintendent T. A. Hoverstad regarding native grasses in the Red River Valley was their low yield of pasture or hay. His first work in grasses, forages and legumes was to run variety trials. From seed planted in 1896 on the Northwest Station trial plots, good crops of hay were harvested from Medium Red, Mammoth and Alsike clovers, Timothy Red Top, alfalfa and Bokhara (white blossom sweet clover), Brome grass (*bromus inermis*), Red Top, slender wheat grass, Kentucky blue grass, Canadian blue grass, meadow fescue and Orchard grass. In 1897, when sown alone and in combination, certain significant results of the early work with grasses and legumes stood out and were: Red and Mammoth clover could be successfully grown; Brome grass (*bromus inermis*), meadow fescue, Kentucky and Canadian blue grasses, Timothy and Red Top were not only hardy but more productive than native grasses. Alfalfa proved a desirable crop and Bokhara (white blossom sweet clover) produced a good yield and was recommended as a green manuring crop.

Later tests in the grass gardens and

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NORTHWEST EXPERIMENT STATION

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pasture trials at the Station, in the past two decades, have proved the value of the Brome and meadow fescue grasses for pasture mixtures in the Red River Valley. During the decade of 1910 to 1920, Brome grass was in general disrepute in the Red River Valley due to the inseparable mixture of quack grass seed and the difficulty of eradicating the crop with its mixtures. With the advent of weed seed legislation and seed certification, pure seed of Brome grass was later obtained and the former popularity of the crop was restored.

Bokhara (sweet clover), which was given a favorable report in the late nineties, was, according to a later verbal report of T. A. Hoverstad to the present superintendent, dropped from the tests and thoroughly eradicated because of its weedy nature. The crop was later reintroduced on the Northwest Station in 1912 as a soil improvement crop on alkali spots in the experimental orchards. The sweet clover crop was used as a soil improvement and honey crop for several years in the horticultural plots until its merits were proved and it permanently replaced medium Red Clover in the crop rotations in the early twenties. The plowing down of sweet clover, followed by late summer fallowing, has become a standard recommended practice in the preparation of land for sugar beets and the cleaning up of weedy land for other crops.

More recent agronomic studies in the production of grasses and legumes have dealt with variety and strain tests, hardiness, disease resistance, palatability and observations on livestock preference in pasture trials.

The Northwest Experiment Station played an important part in the early introduction and distribution of Grimm alfalfa. While several carloads of alfalfa seed were shipped into the Red River Valley in 1914, the Northwest Station distributed during that year 18,000 lbs. of alfalfa seed to 521 cooperators. The use of alfalfa has become widespread over the Red River Valley as a hay crop. The east and northeast portions of the Valley have become important seed growing centers. The current work at the Experiment Station with the alfalfa crop has been confined to variety and disease resistance tests, fertilizer and pasture trials.

Potato Investigations

A great deal of work has been done with potatoes through the fifty years just passed. Variety trials have figured prominently in the potato work. Other tests included in the published reports on potato work include: spraying tests, seed treatment, amounts of seed per acre, size of seed pieces, transmission of virus diseases through the seed piece, depth of planting and cooperative testing of new breeding material.

Garden Crops

Variety and culture tests of garden crops have continued since the founding of the Experiment Station. Varietal recommendations have been made to farmers and gardeners through printed

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and mimeographed publications. Major emphasis in the garden work in recent years has been placed on tomato trials of new-named and hybrid selections of tomatoes.

Progress in Fruit Production

During the early years of the Experiment Station, the work in fruit production followed largely the pattern set up by the State Horticultural Society. That pattern was to grow seedling fruits in quantity in the hope of finding outstanding chance seedlings. In the 1901, report of the director of the Minnesota Experiment Station, it was reported that "several thousand apple, plum and other seedlings are now growing on the grounds." Reports also indicated that a seedling plum orchard planted in 1896 had produced satisfactory crops of fruit. At the time of the arrival of the present Superintendent in 1911, all evidences of the seedling plum orchard had been erased. A large number of seedling plums, however, were found growing among the trees in the windbreaks. Several of the seedling plums were superior to the native species; however, many were too late in season and too poor in quality to compete with late variety introductions from the Minnesota State Fruit Breeding Farm and other Experiment Stations.

An orchard of one-hundred trees, which was planted in 1910, had a fair per cent of survival in 1911. One tree, an Early Strawberry crabapple, is the lone survivor in 1946 of the 1910 planting of apples, crab apples and plums; that tree through the years has been a consistent annual cropper.

More than 400 apple trees of eleven standard varieties, 350 crab apples of nine varieties, and 75 plums of eleven varieties were planted during the period of 1910-1917. In addition, new hybrid seedling apples and plums were secured from the Fruit Breeding Farm. Standard hardy varieties of currants, gooseberries, raspberries, strawberries and grapes were included in the variety trials. It was soon found that many of the old standard varieties of fruit were not hardy in the Red River Valley. It was also found, through a culture test with apple and crab apple varieties, that bare fallow induced late summer growth of trees which, in turn, increased winter injury. Fruits such as red raspberries, strawberries and plums soon proved to be good indicators of excessive soil alkalis. Much of the soil in the horticultural plots was highly alkaline with pH readings ranging from 8. to 8.25. White Blossom sweet clover proved of some value as a preparatory crop for tree fruits. Agricultural sulfur with applications of 5 to 10 tons per acre reduced the alkalinity sufficiently to grow strawberries successfully. The work with strawberries and raspberries made progress after suitable locations for those fruits had been found on the experimental plots. Red raspberries produced the most satisfactory crops when given winter protection by bending down and covering the tips of the canes.

The most recent work with strawberries has been the testing of fifty hardy

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varieties developed at the Great Plains Experiment Station at Cheyenne, Wyoming. The eight or ten varieties which have been selected for further increase have excellent quality fruit and appear to be quite resistant to the effects of soil alkali.

The Virginia crab apple, planted as a filler tree in the apple orchards, survived where most of the apple varieties failed. The Hibernial variety has been the best survivor of old standard varieties of apples. Of the newer varieties of crab apples, the Dolgo has proved to be the hardiest with no winter injury in the years of growth. The older orchard, with its surviving Virginia and Siberean crab apples, has been replanted to some of the newer apple varieties.

A new fruit orchard of five acres for variety tests of apples, crab apples, plums, cherries and apricots has been planted on the lighter soil types found on the West Farm of the Experiment Station. Growth and performance comparisons between standard varieties will be made on the Fargo clay loam and Beardon loam soils. Many of the plum varieties and plum-cherry hybrids are now fruiting.

ANIMAL HUSBANDRY, 1895-1920

The first record of experimental work done in livestock management was reported in the experiment Station report for 1897. The project was the determination of the amount of feed required by horses when working and idle.

While no records of performance of flocks of sheep and herds of cattle have been left in the files covering the period 1895 to 1910, yet frequent references have been made of purchases and sales of farm animals. Records show that Shropshire sheep, large Yorkshire and Duroc Jersey swine and Galloway cattle were on the farm in 1902-03. By 1910, the dairy cattle herd consisted chiefly of the Holstein, Milking Shorthorn and Guernsey breeds with both purebred and grade animals in each breed. The beef cattle herd consisted principally of Shorthorn, Angus and Hereford breeds. The beef herd was kept very largely for school and demonstration purposes. During the period 1910 to 1920, most of the grade animals were weeded out of the dairy and beef herds and the milking strain of Shorthorn cattle was dropped with preference given to the beef type Shorthorns. The dairy herd was built up through the use of good sires. During this period, the value of straw sheds was demonstrated for the overwintering of beef cattle.

Considerable experimental work with swine was done during the period 1913 to 1920. The Duroc Jersey breed was used for most of the experimental work. The work consisted chiefly of feeding and pasture trials. In the feeding trials, high and normal protein rations were used, self-feeders were compared with hand feeding, costs of producing hams on fall versus spring litters were kept and crosses of Yorkshire and Duroc Jersey breeds were made in the production of market hogs.

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The flock of grade and purebred Shropshire sheep was maintained very largely for classroom work and demonstration pasture trials until more definite projects were started in 1920.

Purebred Percheron mares purchased in 1911-12-13 furnished the foundation stock for homebred work horses used on the farm.

LIVESTOCK AND LIVESTOCK PROJECTS, 1920-1945

O. M. Kiser

The Northwest Station in 1945 is maintaining purebred herds of Holstein and beef type Shorthorn cattle, Hampshire and Shropshire sheep, Poland China swine, and a number of head of purebred and grade Percheron horses. In addition, a breed of cross-bred swine, the Minnesota No. 2, is being developed. The purebred herd of Holstein cattle is being bred up through the use of sires from high producing dams.

In the past, some pasture trials have been conducted with dairy cows. The corn silage and sweet clover silage have been fed in a comparative feeding trial with dairy cows. The results of the trial showed no difference in the feeding value of the two silages.

The herd of beef type Shorthorns has been maintained for foundation stock for farmers of the area.

BEEF CATTLE FEEDING AT NORTHWEST EXPERIMENT STATION:

Extensive beef cattle trials have been conducted at the Northwest Experiment Station in cooperation with the Division of Animal Husbandry, University Farm, St. Paul. During the years covering the beef feeding trials, nearly 400 head of beef cattle were fed in many different feeding trials.

Feeds suitable for beef production such as alfalfa, sweet clover, corn silage, corn, oats and barley are produced in abundance in the Red River Valley. In the various trials that were conducted, emphasis was placed on the comparative feeding value of roughages and concentrates common to the Red River Valley region. As a roughage for wintering yearling steers, sweet clover hay was found to be equal to alfalfa when these roughages were fed with corn silage and oat straw. In another trial, sweet clover hay in the ration for fattening two-year old cattle, produced gains at the rate of 2.86 pounds per head daily as compared with an average daily gain of 3.08 pounds with alfalfa hay.

An acceptable basic ration for fattening baby beeves was found to be ground barley, alfalfa or sweet clover hay and oilmeal. When oats was substituted for an equal weight of barley, the rate of gain was less, feed requirements increased, the cost of gain was larger and a less desirable market finish was obtained.

During the early 1930's, when wheat had a very low market value, that grain was used in two different trials in rations for fattening baby beeves. Wheat

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was found to be equal to barley in rations for fattening baby beeves; however, the desirability of feeding wheat depends largely upon the price of that grain as compared with barley. Rye was found to be less palatable than other common grains for fattening baby beeves. This grain, when infested with as much as 5 per cent ergot, produced unfavorable results. Molasses beet pulp proved equal to barley in baby beef fattening rations.

The cattle feeding investigations at the Northwest Station amply covered feeding rations of various combinations of feeds commonly grown throughout the Red River Valley region.

SHEEP INVESTIGATIONS:

During the years, several sheep projects have been carried out. The following are some of the sheep problems that have been investigated.

1. Size in market lamb production. The investigation was based on the results with lambs from large-type ewes and ewes of a smaller type. Each group of ewes was bred to a ram of similar type. Grade ewes were used in this study.

2. The tendency towards production of twin lambs or single lambs by Shropshire ewes. The Shropshire ewe flock was divided into two groups. Those showing evidence of an inheritance for twins were in the twin ewe group; those ewes that came from a line where singles predominated were placed in the group called the single-ewe group. Each group was mated to rams of the same inheritance tendency as the ewes to which each was mated.

3. Feeding native lambs. The object of which was to demonstrate the loss to the lamb producer, if lambs were sold as feeders. Keeping the lamb until it was in slaughter condition will add to the profit of lamb production.

4. Close breeding of Shropshire ewes. At the present time, breeding rams are selected from the Station flock. No outside ram has been used for several years.

5. Cross-breeding of sheep. An Oxford ram has been used on both Hampshire and Shropshire ewes. Lambs of this cross grow to a heavier weight than either Shropshire or Hampshire lambs of the same age.

6. An open-face flock of Hampshire sheep is being developed at the Station.

SWINE BREEDING:

Starting in the fall of 1923, investigation in the cross-breeding of swine was begun. This work covered a period of six years. The combined work in cross-breeding at the Northwest Experiment Station and the West Central Experiment Station, Morris, was published June 1935 in Minnesota Bulletin No. 320.

When care is followed in selecting breeding stock, cross-breeding was found to be a means of securing large litters of pigs that made more economical gains than pigs from carefully selected purebred swine.

A swine breeding project, initiated in the fall of 1939, had for its object

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the determination of the relative merits of the highly inbred Poland China swine produced at the Southeast Experiment Station, Waseca, in developing a purebred herd of Poland China. This inbreeding work had only gotten started when the Bankhead-Jones bill was passed, establishing the Regional Swine Breeding Laboratory. The Northwest Station became a part of the Regional Laboratory in the fall of 1937. This is an extensive inbreeding program; the initial work at the Station began with the purchase of eight Poland China ewes and one boar. From this foundation stock, two inbred lines were developed. The Poland China pigs farrowed in 1944 and 1945 were the offspring from crossing the two lines, Market Lady and Black Star.

A new line of hogs was started in the fall of 1941 by the use of a Yorkshire boar on sows from the two Poland China lines. This new line is known as the Minnesota No. 2 hog. Closed breeding has been followed in the line beginning in the fall of 1942 with the selection of gilts and boars from the 1942 spring pigs. This new line possesses merits that promise to be necessary for the hog of the future. Minnesota No. 2 sows have an ability to farrow large litters. The pigs are able to finish out at a light weight without an excessive amount of fat. The cost of gains on the No. 2 pigs have been economical.

Poultry Production, 1895-1922

A poultry flock was built up at the Experiment Station soon after its establishment in 1895. By 1902, the poultry flocks consisted of Barred and White Plymouth Rocks, White Leghorns, Light Bramas, Cornish Indian Games, Piken ducks, African geese and Bronze turkeys. In 1903, a poultry specialist was secured, Mr. C. S. Greene. Superintendent T. A. Hoverstad reported later that the modern methods of culling poultry, known as the Hogan system, had its origin at the Northwest Experiment Station. A bulletin on poultry, Minnesota Experiment Station bulletin No. 119, was published later in 1909 by C. E. Brown, poultryman at the Station until 1921. The early poultry work dealt largely with poultry house construction, feeding and breeding for high egg production. The White Leghorn breed was used in most of the experimental work during the period 1910-1920.

Poultry Husbandry 1922-1945

A. M. Pilkey

The Northwest Experiment Station at the present time is maintaining purebred flocks of white Leghorns and Rhode Island Reds, a large flock of inbred-hybrid and back-cross fowl, and a small flock of heavy out-cross fowls. All of the station flocks are used for project or demonstration purposes. Approximately 750 laying hens are maintained throughout the year and upwards of 3000 chicks are matured annually on the station range.

Breeding projects and feeding trials were the chief projects during the

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NORTHWEST EXPERIMENT STATION

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earlier years of the Station work. More recently the project work has centered around the Federal project "Genetic Reaction of the Fowl." This project is a part of the state and nation-wide breeding program under the direction of the Department of Animal and Poultry Husbandry, University of Minnesota.

One of the early projects was that of trapnest, progeny testing of fowl and as a result of this work the average production of the Station flock was increased from 144 eggs during the year 1922-23 to a flock average of 221 eggs in 1933-34. In 1923, eight hens laid over 200 eggs each; by 1927, six white Leghorn hens produced over 300 eggs each during the year with a maximum record of 318 eggs. The all-time high record for the Station is 321 eggs made by hen No. 15 in 1928.

Considerable work was carried on in the field of vitamin requirements of fowl from 1925 to 1930. The addition of 1 per cent cod-liver oil to the Station standard ration in 1925-26 resulted in an increase of 6 per cent in egg production, 14 per cent increase in fertility of hatching eggs, 19 per cent increase in hatchability, a reduction in mortality of over 1 per cent, and a control of leg weakness now known as a vitamin deficiency. Later trials indicated that many other fish oils were equally as satisfactory as an anti-rachitic oil for poultry, the best of which was a Burbot fish oil produced at Warroad, Minnesota.

As a result of the grain feeding trials, many combinations of common farm grains plus supplements of animal and vegetable protein, calcium and vitamin D were found to adequately meet all the requirements of fowl.

The practice of starving chicks for long periods after hatching before feeding was proven false in 1930. Chicks starved 72 hours lost 44 per cent of their weight. The results of these trials indicated that best results were obtained when chicks were fed within twenty-four hours after hatching.

When proso millet was fed as a substitute for yellow corn, it was necessary to increase the feeding of alfalfa leaf meal by 5 per cent in order to add sufficient vitamin A to the ration. The addition of 4 per cent manganese sulphate to the diet of breeding hens controlled excessive outbreaks of Perosis in chicks.

The use of artificial lights indicated that egg production was increased during the fall months if the hours of light was not extended over a fourteen-hour day. It did not, however, materially increase the annual egg production. All-night lights were injurious to the health of the fowl.

Incubation projects consisted of checking on the importance of the position of the eggs during incubation period in gravity and forced draft machines, the causes of embryonic mortality in chicks, humidity and temperature studies during incubation and hatching periods.

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The Station flocks have been subjected to an annual blood test for control of pullorum (B.W.D.) for the past seventeen years and have been found clean for fifteen of the seventeen years. As a result of the blood testing work, our chick losses from pullorum have been negligible.

The major project in recent years, "Genetic Reaction of Fowl," began unofficially in 1934 at this Station with a number of father-daughter brother-sister matings. The project was officially organized as a state Experiment Station cooperative project in 1936-37. In 1940 the project was reorganized on a state and nation-wide basis and the lines of breeding identified by line numbers. The Crookston lines being lines 205, 210, 220, 230. By 1944 lines of breeding had advanced to the degree of in-breeding that nonrelated inbred matings were attempted. As the scope of the breeding program increased, our inbred lines were sent to the Central Station and all inbred-hybrid crosses were made there. The Northwest Station is now chiefly a progeny testing center for all breeding lines.

Many single crosses between the inbred lines have been made. Two three-way crosses were also made. One year's results of inbred x non-inbred Leghorns are now available. The breeding co-efficient has increased in all inbred lines. In general, reasonably satisfactory performance has been maintained. Preliminary results indicate that inbred lines may be combined to secure stock having hybrid vigor. The poultry industry is in need of improved economic qualities of chickens. The results of this project indicate that inbred strains mated with both inbred and non-inbred stock may be helpful in achieving this improvement. This will be particularly important if it is found that inbred stock topcrossed on random mated stock gives consistent improvement in the future as it has in the past recent years.

In 1944 the Northwest Experiment Station became a cooperative with the Divisions of Poultry Husbandry and Agricultural Engineering at University Farm, St. Paul, and the Ontario Paper Company in testing the efficiency of Insulite as a material for poultry house construction. The Insulite poultry house 24' x 24' was used during the winter of 1944-45. A complete record of flock performance, temperature and humidity data was collected. Additional records will be kept during the coming winter. Comparable tests of houses of similar construction are being made at University Farm, St. Paul.

WINDBREAK AND LANDSCAPE PLANTINGS

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are still growing just west of the new Physical Education building.

Considerable landscape planting was done around the original farm house through the Hoverstad and Robertson administrations. Rows of Green Ash, marking the main driveways, the windbreaks and the plantings on the farm

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WINDBREAK AND LANDSCAPE PLANTINGS

(Continued from Col. 2)

house grounds constituted the landscape plantings on the grounds in 1911.

The first landscape plan for the development of the campus and Experiment Station grounds was drawn by a commercial landscape firm of Morel and Nichols. This plan located the sites for all buildings constructed since that time, and together with a supplementary plan drawn in 1924, outlined the tree, shrub, and flower plantings. A stubborn soil of high alkalinity was unfavorable for many of the recommended trees and shrubs; however, by trial and error methods, adaptable species were soon found. The campus and windbreak planting of trees now contain more than fifty species and variety of trees. Some sixty species of shrubs and woody vines, and more than one-hundred varieties of perennial and biennial plants are used in the ornamental plantings around the campus and grounds. One hundred or more varieties of annual flowering and bedding plants are used each year in the flower bed plantings. A greenhouse, with a central conservatory and two propagating houses, is used for the growing of bedding, ornamental and garden plants.

The second phase of the tree planting work at the Northwest Station was started in 1912 in the development of the present landscape plan for the campus and supplemental plans for windbreaks. During the five-year period 1912-1916, inclusive, more than 8,000 trees of some thirty-three varieties and species were planted on the campus and in the windbreaks. White Elm was used as the permanent boulevard tree with Norway and Carolina poplars planted as filler trees. Green Ash and Hackberry were used as permanent trees for the boulevard planting near the campus residences with Box Elder used as a filler tree.

During the period 1912-1945, many species of evergreens were planted on the campus, in the windbreaks and in nursery rows.

The many species of evergreens which have added to the beauty of the campus and the effectiveness of the shelter belts have been quite largely grown from small transplants set in the Station nursery. The older Colorado, Blue, Black Hills and White Spruce trees were taken from the windbreak in the site where the central heating plant now stands. Specimen trees for the sunken garden and greenhouse garden were purchased from nurseries. Practically all of the evergreen species planted in the past two decades have come from the School and Station nursery. Transplanted evergreen stock, now in the nursery rows, will provide material for the future farm forestry plots. Much valuable data on the adaptability of the many species of pine, spruce, red cedar, white cedar in their various horticultural varieties has been collected and made available to farmers of the area.