

The North Dakota Agricultural Experiment Station¹

I. ESTABLISHMENT AND EARLY HISTORY

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The North Dakota Agricultural Experiment Station was established by an act of the First Legislative Assembly of North Dakota approved March 8, 1890. By this act the Legislative Assembly gave assent to the Hatch Act, an act of the Congress of the United States, approved March 2, 1887.

Section 1 of the act of assent located the college. It reads as follows:

1. LOCATION. There is established and located at Fargo, Cass County, North Dakota, an agricultural college, which shall be known by the name of the North Dakota Agricultural College (1).

Section 16 of this same legislative act reads as follows:

EXPERIMENT STATION. There is hereby established an agricultural experiment station in connection with the North Dakota Agricultural College, and under the board of directors of said college, for the purpose of conducting experiments in agriculture, according to the terms of Section 1 of an act of Congress, approved March 2, 1887, and entitled "An act to establish agricultural experiment stations in connection with the colleges established in the several states under the provisions of an act, approved July 2, 1862, and of the acts supplementary thereto" (2).

Section 17 of this same legislative act reads as follows:

17. ASSENT OF LEGISLATIVE ASSEMBLY. The assent of the Legislative Assembly of North Dakota is hereby given, in pursuance of the requirements of Section 9 of said act of Congress, approved March 2, 1887, to the grant of money therein made, and to the establishing of an experiment station in accordance with Section 1 of said act, and assent is hereby given to carry out all and singular the provisions of said act. (3)

Section 1 of the Hatch Act of 1887 provided that there should be within the several colleges "for the benefit of agriculture and mechanic arts . . . a department to be known and designated as an 'agricultural experiment station'." (4)

Section 2 of the Hatch Act writes a charter of the duties and responsibilities of the experiment stations established by its provisions. Section 2 reads as follows:

"That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with remedies for the same; the chemical composition of useful plants at their different stages of growth;

¹First of a series of articles which will appear in the Bimonthly Bulletin, reviewing the history of the North Dakota Agricultural Experiment Station.

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the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soil and waters; the chemical composition of manures, natural or artificial with experiments designed to test the comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches and experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions of the respective states and territories." (5)

Section 2 is a comprehensive charter, the provisions of which have been zealously adhered to by the staff of this station. Numerous examples of experiments within the classifications listed have been reported upon in the 356 bulletins published by the college beginning with Bulletin No. 1 on **Grain Smuts** published in January, 1891, and the latest, **Bulletin 356 North Dakota's Agricultural Progress Through Research—Annual Report of the Experiment Station 1949.**

The First Land

An agricultural college and experiment station cannot function without land. The second legislative assembly provided the initial grant of land in the provisions of Chapter 6 "Appropriating Section of Land to Agricultural College" approved January 16, 1891.

Chapter 6 reads as follows:

An Act Designating and Appropriating Section Thirty-six (36) in Township One Hundred and Forty (140), of Range Forty-nine (49) West, in the County of Cass, for the Use of the State Agricultural College as a site for that Institution.

Be it enacted by the Legislative Assembly of the State of North Dakota:

1. **APPROPRIATION OF LAND.** Consent having been given by the Congress of the United States, by an act approved September 4, 1890, to the appropriation by the State, of section 36, in township 140, of range 49 west, situated in the county of Cass, being a portion of the lands granted to said State for the purpose of common schools, for the use of the State Agricultural College as a site for that institution; said section 36 is hereby designated and appropriated for the use of such Agricultural College for a site and for the purpose of an Experimental Station; and all moneys hereafter appropriated for the erection of buildings and improvements for such college shall be expended in the erection of such buildings and improvements on such section.

2. **SUBJECT TO LEASES IN FORCE.** The appropriation hereby made is subject to all leases of said land by the State now in force. Approved January 16, 1891. (6)

Because of the leases referred to in the second section of the foregoing act, possession of the land was not secured until April 18, 1891. (6A).

First Governing Board and Temporary Staff

The Board of Control appointed by the governor, in compliance with the act creating the station, met and organized May 1, 1890. Its membership was as follows: O. W. Francis, lawyer, Fargo, president; J. B. Power, farmer, Power P. O., secretary; E. M. Upson, farmer, Cummings; J. D. Wallace, merchant, Drayton; and M. J. Sanderson, farmer, Edgeley. (7). E. M. Upson did not attend the organization meeting. S. S. Lyon, cashier of the First National Bank of Fargo, was named treasurer. (7A)

On May 15, 1890, at an adjourned meeting this board voted to "appoint a station staff for temporary service, and complete without delay the necessary preparations for immediate commencement of work of the Experiment Station, and to have the same carried on as far as practicable the present season." In the furtherance of this vote Dr. Samuel T. Satterthwaite, retired physician of Fargo, was appointed director, with Messrs. James Holes, farmer of Fargo as superintendent and Jacob Lowell as assistant. (7) (7A).

The temporary organization which was set up terminated October 15, 1890, when the permanent organization described in the paragraphs which follow was set up.

Launched By Five Young Men

Five young men launched the North Dakota Agricultural Experiment Station. They came to this young state and new institution with remarkably good training and experience for the times. At the helm was H. E. Stockbridge as director, a graduate of Massachusetts Agricultural College and holding the doctor of philosophy degree in chemistry from Goettingen University in Germany. He left the directorship of the Indiana station at Purdue University, bringing with him two colleagues, H. L. Bolley, as botanist, who held B.S. and M.S. degrees from Purdue, and T. D. Hinebauch, as veterinarian who held B.S. and M.S. degrees from Michigan State Agricultural College and a V.S. degree from the Toronto Veterinary College. Clare B. Waldron, B.S., Michigan Agricultural College joined the staff as arboriculturist. C. B. Waldron reported for duty July 19, 1890, and for the next three months was the only member on the staff of the college or experiment station. (7A).

As chemist to the station, the then assistant chemist of the New York Agricultural Experiment Station at Geneva, Edwin F. Ladd, a graduate of Maine State College (now the University of Maine) was chosen.

Biographies of these five young men published in the first "Prospectus of the North Dakota Agricultural College" reveal that these men were of the following ages in 1891: Stockbridge, 32; Ladd, 32; Hinebauch, 31; Bolley, 25; and Waldron, 25. Of this group, only H. L. Bolley, retired, is still living. He was 85 years of age on February 1, 1950. C. B. Waldron retired in 1945. Shortly

after his retirement he died at Ft. Lauderdale, Florida, March 6, 1947, at the age of 81. E. F. Ladd died June 22, 1925, in Washington, D. C., while serving as United States Senator from North Dakota, to which office he had been elected in 1920. Hinebauch resigned sometime in the fiscal year 1896-97. Stockbridge was removed on May 9, 1893.

Ladd created a strong chemistry department, specializing in the chemistry of foods, paints, linseed oil, and cereal chemistry. Bolley concentrated upon the diseases of crops, particularly of flax, cereals and potatoes; and upon standardization of pure seed supplies. Waldron specialized in landscape design and in horticulture. Hinebauch made the first investigations of the ills of livestock.

The First Staff

The First Annual Report of Director Stockbridge adds "Additions to the staff will be made as required. One, at least, and he in many respects filling the most important position of all, as Agriculturist, will be on the ground for the beginning of out-of-door work the coming season." (8). In his Second Annual Report, Director Stockbridge names that first Agriculturist—W. M. Hays, B.S. (9).

Director H. E. Stockbridge was removed by order of the Board of Trustees May 9, 1893. Mr. J. B. Power, then secretary of the board, was named Director. W. M. Hays, the first Agriculturist, resigned October 1, 1893, to accept a similar position at the Minnesota Station. He was succeeded by John H. Shepperd, M.S.A., a "graduate of the Iowa Agricultural College, postgraduate of Wisconsin University in Dairying, and lately assistant editor of the Orange Judd Farmer." (10).

First Buildings

(Offices and Laboratories)

The newly established Agricultural Experiment Station had land and a staff, but no buildings. The first staff consisting of the director and one staff member had offices on the third floor of the Red River Bank building at 11 Broadway. (7A).

The first buildings for the Agricultural College were provided for by an appropriation act, Chapter 13, Second Session of the Legislative Assembly approved February 27, 1891. That act reads as follows:

Agricultural College Buildings

An Act Providing for an Appropriation for the Erection of Buildings for the State Agricultural College at Fargo, and for the Contingent Expenses Incident to the Construction Thereof.

Be it enacted by the Legislative Assembly of the State of North Dakota:

1. APPROPRIATION. That there is hereby appropriated out of the moneys in the State Treasury not otherwise appropriated the following sum of money for the erection of suitable buildings for the State Agricultural College and for the contingent expenses incident to the construction thereof, namely \$25,000. (11).

The appropriation for buildings provided the "three story building of buff brick, with base and trimmings of Duluth brown-stone" now known as "Old Main." This structure provided offices and classrooms for teachers, and offices and laboratories for research workers. The first Experiment Station laboratories in chemistry, botany, and veterinary science were in "Old Main." (12)

The first farm operations were hampered by lack of facilities. Director Stockbridge, writing in his second Annual Report (Jan. 30, 1892) said "The absence of buildings or quarters for teams or men on the farm made constant travel to and from headquarters in town necessary, under which condition work was necessarily conducted at a serious disadvantage." (13).

Another initial handicap to the first farming of the college farm was the weedy condition of the farm—"some of it having been cropped by renters for 12 years, during which a portion of it became exceedingly foul with noxious weeds." In spite of this handicap Director Stockbridge proudly reports that "The crops actually grown by us were kept exceptionally free from weeds by constant vigilance and repeated pulling." (14).

Writing in his Third annual report (dated Feb. 1, 1893) Director Stockbridge reported no improvement in the farm building situation saying, "Farm teams are still sheltered in several different barns hired for the purpose and situated more or less remote from the farm to be worked. Farm men are housed in rented quarters secured for the purpose." Relief was in sight, however, for on Feb. 28, 1893, the governor approved the following legislative act: (15).

"An Act Providing for an Appropriation for the Erection of Additional Buildings and for the Payment of the Contingent Expenses of the North Dakota Agricultural College at Fargo.

Be it enacted by the Legislative Assembly of the State of North Dakota:

1. APPROPRIATION. That for the erection of additional buildings for the North Dakota Agricultural College at Fargo and for other purposes connected therewith; there is hereby appropriated out of any moneys in the treasury not otherwise appropriated the following sums of money, to-wit:

For erection of dormitory	\$17,000
For furnishing the same	3,000
For erection of farm house and barn	13,000
For erection of shop for mechanical department	9,000
For completion of main building	3,000
For necessary incidentals	10,000

The farm house still stands on the campus although it is scheduled for removal and relocation. The first "general purpose" barn provided by this appropriation was destroyed by fire on January 4, 1901. (16). The dormitory was used for its original purpose until 1898 when it was converted into classrooms and offices for the departments of agriculture, horticulture and veterinary science, a portion of the building still being retained for "domestic science." The building was then renamed Francis Hall in honor of the president of the first board of directors. (7A).

First Farm Research

The first scientific work of the Experiment Station was conducted by C. B. Waldron, the first member of the staff other than the first director. Director Stockbridge, in his first annual report dated January 31, 1891, writes: "On July 17th Professor C. B. Waldron began the collecting and classifying of portions of the local flora under an engagement with the station authorities. In this work, special attention has been given to the native grasses and to the weeds likely to prove injurious; of the former some 40 species have been collected, two or three of which have never been cataloged. Outside of the grasses about 150 species were collected. Aside from collecting them in the Red River Valley, collecting trips were made to the vicinity of Devils Lake, the Turtle Mountains Region, and to the Missouri River Valley north of Bismarck." (7).

Seed was collected of the leading hay and pasture grasses and sown in 1891 in small plots on the station grounds, this being about the first work started of an experimental nature. (7-A). During the year 1891 the collecting of plants was conducted now in cooperation with H. L. Bolley who had come to the institution in October, 1890. (7-A).

The handful of young men who launched the work of the station lost no time in getting at productive work for they had an untouched field in which to work. The first bulletin, Bulletin No. 1 on "Grain Smuts" by H. L. Bolley was issued January, 1891. In the first decade of the history of the station ending in December, 1900, forty-six bulletins were published of which 11 were by H. L. Bolley, seven by E. F. Ladd, nine by J. H. Shepperd, eight by C. B. Waldron, four by T. D. Hinebauch, two by A. M. Ten Eyck, and one by J. H. Worst. In addition to the publication of 46 bulletins, the first 10 annual reports published contained important findings not published elsewhere.

Notable Findings of First 10 Years

Work which stands the test of time establishes confidence in scientific research. Some of the more important investigations of the first 10 years which have stood the test of time include the following:

1. Application of the corrosive sublimate treatment for the control of potato scab. (See Bulletin No. 4, Dec., 1891, by H. L. Bolley).
2. Proof that the **deep scab** of sugar beets is due to the organism causing **deep scab** of potatoes. (See Bulletin No. 4, Dec., 1891, and Bulletin No. 9, March, 1893, by H. L. Bolley).
3. Proof that millet hay when used entirely as a coarse feed is injurious to horses. (See Bulletin No. 7, Sept., 1892, and Bulletin No. 26, Nov. 1896, by T. D. Hinebauch.)
4. Introduction of formaldehyde in the control of seed borne diseases. (See Bulletin No. 27 "New Studies upon the Smut of Wheat, Oats and Barley with a Resume of Treatment Experiments for the Last Three Years" by H. L. Bolley, March, 1897.)

In Table No. 3 in Bulletin 27, Bolley reported the influence of formalin upon the germination of wheat, oats, and barley and in Table No. 17 he reported the effect of formalin treatment of wheat seed upon the yield per acre and the per cent of smut.

In the Eighth Annual Report of the director of the station published Feb. 1, 1898, Bolley wrote,

"In March of this year (1897) Bulletin No. 27 was published, detailing the work upon the treatment of wheat, oats and barley for the prevention of smuts as done at this station for the past three years. It is believed that the substance known as formalin, first recommended by this station, will prove by far the best preventive yet investigated for the smut of oats, and perhaps also of wheat. It was found to be very effective in 1896 and the report for 1897, which is here appended, shows it to be very easy of handling and very effective." In recent years mercurial dusts, and other new seed disinfectants have generally replaced formalin.

5. Proof that lower grades of wheat were higher in protein (Albuminoids) than "Number One Hard." (See Bulletin No. 8, "Wheat Growing and Dairying for North Dakota" by E. F. Ladd and W. H. Whalen, Dec., 1892.)

This appears to be the first of a long series of studies by E. F. Ladd upon the chemistry of wheat. The authorities stated: "In comparing the average composition for the different grades, we find that the amount of albuminoids¹ is greater in the poorest grade of wheat, and is less for each grade as the quality improves." The authors point out, however, that the trend of the times even in 1892 was for a snow white flour. They add the following significant statement: "The lower grades of wheat, having the greatest per cent of albuminoids, will produce a flour that gives a yellowish tint to the bread, against which fashion rebels." This first paper goes on to say that "This is unfortunate, for it is from the albuminoids nitrogenous portion that we secure the material to build up a strong and healthy muscular system—the lean meat. Instead of this we are forcing the miller to separate out to be fed to our animals the parts that should go to build bone and muscle for man."

¹The term "protein" is now generally used instead of "albuminoids."

The authors recognized that the low grades of wheat yield a lower percentage of flour because of the difficulties in extraction.

6. Introduction and Tests of Austrian Brome grass (See Third Annual Report of the North Dakota Agricultural Experiment Station, Feb. 1, 1893. P. 24) C. B. Waldron reported "The trial of grasses commenced in the summer of 1891 in which 35 grasses and forage plants were sowed with wheat showed that only two grasses, timothy and one of the brome grasses, *Bromus inermis*, made sufficient growth to furnish a heavy stand of grass the succeeding season."

Other important contributions include Bulletin 46 "A preliminary list of the Spermaphyta-seed-bearing plants of North Dakota" by H. L. Bolley and L. R. Waldron; Bulletin No. 25 on "Tree Culture" by C. B. Waldron; Bulletins No. 24, 32, and 35 by E. F. Ladd, containing studies on soils, especially on the importance of maintaining the humus content of the soil; Bulletin No. 29, "A study of methods of cultivation" by J. H. Shepperd and Jos. A. Jeffery. A. M. Ten Eyck's two bulletins, Nos. 36 and 43, on the roots of crop plants, carried forward earlier studies begun by W. M. Hays in Minnesota and especially by F. H. King in Wisconsin.

REFERENCES

- (1) Section 1, Chapter 160, Laws passed at the First Session of the Legislative Assembly of the State of North Dakota begun and held at Bismarck, the Capital of said State on Tuesday, the Nineteenth Day of November A. D. 1889 and concluded March 18th, A. D. 1890.
- (2) Section 16, Chapter 160—same source as reference (1).
- (3) Section 7, Chapter 160—same source as reference (1).
- (4) First Annual Report of the North Dakota Agricultural Experiment Station, page 13, published at Fargo, N. D., in 1891—pages 13-16 reproduce the Hatch Act.
- (5) Same as reference (4) (Bismarck, N. D., 1890).
- (6) Chapter 6, Laws passed at the Second Session of the Legislative Assembly of the State of North Dakota begun and held at Bismarck, the Capital of said State, on Tuesday the Sixth Day of January, 1891, and concluded March 6, 1891. (Bismarck, N. D., 1891.)
- (6A) Second Annual Report of the North Dakota Agricultural Experiment Station, Jan. 30, 1892.
- (7) First Annual Report of the North Dakota Agricultural Experiment Station, Feb. 1, 1891, pp. 7-8.
- (7A) Unsigned manuscript history of the Agricultural College by C. B. Waldron.
- (8) First Annual Report of the North Dakota Agricultural Experiment Station, Feb. 1, 1891, p. 8.
- (9) Second Annual Report of the North Dakota Agricultural Experiment Station, Jan. 30, 1892, p. 8.
- (10) Fourth Annual Report of the North Dakota Agricultural Experiment Station, Feb. 1, 1894, pp. 15-16.
- (11) Laws passed at the Second Session of the Legislative Assembly of the State of North Dakota begun and held at Bismarck, the capital of said State on Tuesday, the Sixth Day of January A. D. 1891, and concluded March 6, A. D. 1891. (Bismarck 1891.)
- (12) Same as reference (9) p. 8.
- (13) Second Annual Report of the North Dakota Agricultural Experiment Station, Jan. 30, 1892, pp. 9-10.
- (14) Third Annual Report of the North Dakota Agricultural Experiment Station, Feb. 1, 1893, p. 6.
- (15) Chapter 1 of "Laws passed at the Third Session of the Legislative Assembly of the State of North Dakota begun and held at Bismarck, the capital of said state on Tuesday, the third day of January, A. D. 1893, and concluded March 3, A. D. 1893."
- (16) Eleventh Annual Report of the North Dakota Agricultural Experiment Station (Feb. 1, 1901) p. 9.