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SIXTH ANNUAL REPORT

OF THE

AGRICULTURAL EXPERIMENT STATION

OF THE

UNIVERSITY OF TENNESSEE

TO THE GOVERNOR

1893



KNOXVILLE, TENNESSEE:
OGDEN BROTHERS & CO., PRINTERS AND BINDERS.
1894.

Bulletins of this Station will be sent, upon application, free of charge, to any Farmer in the State.

THE AGRICULTURAL EXPERIMENT STATION

OF THE UNIVERSITY OF TENNESSEE.

CHAS. W. DABNEY, JR., PRESIDENT.

EXECUTIVE COMMITTEE:

M. P. JARNAGIN,

JOSEPH W. ALLISON,

O. P. TEMPLE,

W. H. JACKSON,

HUGH G. KYLE.

TREASURER:

JAMES COMFORT.

SECRETARY:

J. W. GAUT.

THE STATION COUNCIL IS COMPOSED OF ITS OFFICERS:

PROF. CHAS. F. VANDERFORD, Secretary.

PROF. F. LAMSON-SCRIBNER, Botanist.

DR. C. W. DABNEY, JR., Chemist.

R. L. WATTS, B. Ag., Horticulturist.

S. M. BAIN, A. B., Assistant Botanist.

J. B. MCBRYDE, Assistant Chemist.

C. E. CHAMBLISS, Librarian and Clerk.

The Station has facilities for analyzing and testing fertilizers, cattle foods, milk and dairy products; seeds, with reference to their purity or germinating power; for identifying grasses and weeds, and studying forage plants; for investigating the diseases of fruits and fruit trees, grains and other useful plants.

The Station Bulletins and Reports will be sent, free of charge, to any farmer within the State.

Packages by express, to receive attention, should be *prepaid*.

All communications should be addressed to the

SECRETARY OF THE

AGRICULTURAL EXPERIMENT STATION,

KNOXVILLE, TENN.

 The Experiment Station building, containing its offices, laboratories and museum, and the plant-house and horticultural department, are located on the University grounds, fifteen minutes walk from the Custom House in Knoxville. The Experiment farm, stables, milk laboratory, etc., are located one mile west of the University, on the Kingston pike. Farmers are cordially invited to visit the buildings and experimental grounds.

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REPORT TO THE GOVERNOR.

Letter of Transmittal.

KNOXVILLE, TENN., January 10th, 1894.

To His Excellency, PETER TURNEY,

Governor of Tennessee.

SIR:—We have the honor to submit herewith the Sixth Annual Report of the Agricultural Experiment Station of the University of Tennessee. This report is made in accordance with the Act of Congress, approved March 3rd, 1887, and the Act of the General Assembly of Tennessee, approved March 28, 1887. Section 5 of the first mentioned Act contains the following: "It shall be the duty of each of said Stations, annually, on or before the first day of February, to make to the Governor of the State or Territory in which it is located, a full and detailed report of its operations, including a statement of receipts and expenditures; a copy of which report shall be sent to each of said Stations, to the Secretary of Agriculture, and to the Secretary of the Treasury of the United States."

Hoping that the report will prove satisfactory to your Excellency, we remain, with great respect,

Your obedient servants,

M. P. JARNAGIN, *Chairman Experiment Station Committee.*

CHAS. W. DABNEY, JR., *President of the University.*

J. W. GAUT, *Secretary of the Board of Trustees.*

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Hoping that the report will prove satisfactory to your Excellency, we remain, with great respect,

Your obedient servants,

M. P. JARNAGIN, *Chairman Experiment Station Committee.*

CHAS. W. DABNEY, JR., *President of the University.*

J. W. GAUT, *Secretary of the Board of Trustees.*

TREASURER'S REPORT.

*The Agricultural Experiment Station of the University of Tennessee, in
account with the United States:*

Dr.	Cr.
1892 and 1893—From July 1st to June 30th. To U. S. Treasury Draft for fiscal year ending June 30th, 1893 . . . \$15,000 00	Salaries \$ 7,408 45 Publishing and Printing . 1,252 57 Travelling Expenses . . 362 18 Heat, Light and Water . . 682 77 Fertilizer and Analysis . 306 00 Apparatus and Supplies . 349 48 Library account 184 16 Stationery and Postage . . 53 55 Contingent account . . . 284 29 Labor account 1,810 29 Farm account 853 44 Repair account 524 26 Botanical account 253 49 Janitor account 233 00 Chemical account 266 52 Horticultural account . . 175 55
\$15,000 00	\$15,000 00

(Signed)

JAMES COMFORT, *Treasurer.*

This is to certify, that as the authorized Auditing Committee of the Board of Trustees of the University of Tennessee, we have examined the accounts of the Treasurer of the Agricultural Experiment Station for the fiscal year ending June 30th, 1893, and find them correct; that the above is a true balance sheet corresponding with said accounts; that the said accounts show no more than seven hundred and fifty dollars was expended for building, and that there is no cash balance.

(Signed)

J. W. GAUT,
F. A. R. SCOTT, } *Auditing Com.*
S. B. LUTTRELL, }

We hereby certify, that Messrs. J. W. Gaut, F. A. R. Scott and S. B. Luttrell are the authorized Auditing Committee of this Board of Trustees.

(Signed)

CHAS. W. DABNEY, JR.,
President of the University of Tennessee.

(Signed) J. W. GAUT, *Secretary.*

Personally appeared before me, A. E. Broyles, Notary Public, the foregoing signers, personally known to me to be trustees and officers of the University of Tennessee, who made oath in due form of law that the above statement is true to the best of their knowledge, information and belief.

(Signed)

ARTHUR E. BROYLES, *Notary Public.*

(SEAL)

REPORT OF THE PRESIDENT.

To the Experiment Station Committee and the Board of Trustees of the University of Tennessee:

GENTLEMEN:—I have the honor to present herewith, in compliance with the law establishing the Agricultural Experiment Station, the sixth annual report of its operations, for the calendar year ending December 31st, 1893, together with the Treasurer's report for the fiscal year ending June 30th, 1893.

The working divisions of the Station from January 1st to July 1st, 1893, were the same as reported for the year 1892.

At the annual meeting of the Board of Trustees, June 5th, 1893, the following report of the Board of Control was approved, and its recommendations adopted and ordered to take effect on July 1st, 1893:

REPORT OF THE BOARD OF CONTROL OF THE AGRICULTURAL EXPERIMENT STATION.

This Committee respectfully submits the following as a basis for the reorganization of the Agricultural Experiment Station. Some of the principles below set forth are already upon the records of this Board as resolutions or regulations, but as they have partly been lost sight of in the practice of the last three years, they are restated here as a part of a complete plan for the working of the Station.

1st. The Experiment Station is a department of the University and, like the other departments, shall be under the general control of the President, aided by a committee of the Trustees, to be called the "Experiment Station Committee," instead of "Board of Control," as heretofore. In conjunction with the President, this Committee shall direct all the operations of the Station and the farm. The President shall assign each person's duties to him, in accordance with the plan of work thus determined, and see that they are performed, making report for the Committee to the Board and the Governor, as required by the Act establishing the Stations.

2nd. The President shall be the financial head of this department, as of all others, and all the funds of the Station shall be appropriated by the Board upon his recommendation and for specific purposes, and paid out only upon warrants approved by him, which must be fully itemized.

3rd. The officers and assistants for the Experiment Station shall be nominated by the President, with the recommendation of such compensation as they should receive, and shall, in these respects, stand on the same footing as the other officers of the University:

4th. The office and title of Director of the Station is hereby abolished, and the title of Assistant Director is changed to Secretary. The duties of the Director, as heretofore fixed, are transferred to the President, who shall be assisted in the correspondence, and in such other ways as he may designate, by the Secretary thus provided, and by a stenographer and mailing clerk (one person) when necessary.

5th. The college farm shall constitute the Experiment Station farm, and shall be devoted to the general purposes of experiment operations.

6th. The work of the Station, whether conducted in the laboratory or on the farm, shall be, as far as possible, of a practical character, and upon questions of interest and importance to Tennessee agriculturists, so as to bring the Station in close touch with the wants and sympathies of the farmers, planters, and stock-raisers of all the different sections of the State.

7th. The entire proceeds of the sale of stock and products of the farm shall be devoted to the keeping up of the supplies of stock and farm implements, and in making repairs and permanent improvements on the farm and buildings, as the Board may order; except so much thereof as may be required to pay for student labor in accordance with the Acts of the General Assembly of 1869.

Respectfully submitted.

(Signed)

M. P. JARNAGIN, *Chairman*.

HUGH G. KYLE.

O. P. TEMPLE.

The present organization of the Experiment Station is as follows :

EXPERIMENT STATION COMMITTEE.

M. P. JARNAGIN, *Chairman*.

O. P. TEMPLE,

JO. W. ALLISON,

W. H. JACKSON,

H. G. KYLE.

The staff of the Station is as follows :

CHAS. W. DABNEY, JR., PH. D., LL. D., *President*.

CHAS. F. VANDERFORD, *Secretary and Agriculturist*.

F. LAMSON-SCRIBNER, B. S., *Botanist*.

S. M. BAIN, B. A., *Assistant Botanist*.

CHAS. W. DABNEY, JR., *in charge of Chemical Division*.

J. B. MCBRYDE, C. E., *Assistant Chemist*.

C. A. MOOERS, B. S., *Assistant Chemist for Fertilizer Work*.

R. L. WATTS, B. Agr., *Horticulturist*.

CHAS. E. CHAMBLISS, B. S., *Librarian*.

THOS. F. PECK, *Foreman of the Farm*.

A GENERAL STATEMENT AS TO THE STATION AND ITS WORK

In the month of July, 1888, began the work of the Experiment Station of the University of Tennessee. During the five and a half years which have passed, constant endeavor has been made

to increase the efficiency of the Station in those lines of work most valuable to the agricultural interests of the State.

An inexpensive, but substantial, building has been erected on the grounds of the University, and therein have been provided and fitted with the necessary apparatus and supplies, the Chemical, Botanical, Horticultural, Biological, and other laboratories. The library contains nearly 2,000 volumes on all the sciences about which Station workers must be informed. To the library, besides the accessions which are permitted by a moderate annual expenditure, there come the bulletins and special reports issued by all other stations in the United States, as well as many from other countries, increasing daily the means for obtaining information in all branches of agricultural science, and of the results of the application of scientific research to practical work.

The well-considered and final decision of the Board of Trustees, declaring that portion of the lands belonging to the University lying south of the Kingston pike, to be the farm of the Experiment Station, enables the Experiment Station Committee to direct future operations with positive assurance that their plans will be carried out as rapidly and completely as available means will permit.

In addition to the work of the dairy, which has been established as the best means of utilizing the products of the farm, field experiments are continued, so planned and conducted as to exhibit in practice the best methods of fertilization and cultivation, and at the same time carry on tests of such new grains and forage plants as promise to be valuable in this State.

The larger and more important work of the Horticultural division will be provided for on the farm, and the work will be steadily prosecuted until every square yard of land, not required for field and feeding experiments, will be utilized by this division.

Much labor and a considerable expenditure of money will be required to accomplish all that is desirable to make the farm just what it ought to be. Under existing conditions, it is necessary to confine expenditures for needed improvements within the limit of the amount reached by the sale of farm products. It is believed that careful management will enable the Station officers eventually to carry out successfully the designs of the Experiment Station Committee.

A short account of a few of the publications of the Experiment Station of the University of Tennessee since its organization as such, will exhibit something of the character and scope of the investigations which have been conducted by its working force.

In relation to the cotton interest, there have been issued:

Bulletin No. 3, Vol. II., 1889. On Cotton-seed Hulls and Meal as Food for Live Stock. This bulletin contained a discussion of the value and adaptability of cotton-seed products as a stock food, based upon chemical determinations of their composition, with suggestions as to methods of using these products. This bulletin was translated into the German language and was extensively circulated on the continent.

Bulletin No. 5, Vol. IV., 1891. A Chemical Study of the Cotton Plant. Contained analyses of the lint, seed, bolls, leaves, stems, and roots of the cotton plant, and of the whole plant, the fertilizing constituents contained in a crop yielding three hundred pounds of lint per acre, etc.; with a discussion of methods of fertilization, and suggestions as to the amounts and kinds of fertilizers required by the crop, etc.

Bulletin No. 2, Vol. VI., 1893. The Rational Use of Feeding Stuffs. Winter Dairying in Tennessee. The first, a discussion of the proper methods of combining the so-called waste products of the cotton plant, of corn, of wheat, with the coarser fodders of the farm so as to realize highest feeding value and at the same time maintain the fertility of the farm. The second, an account of a series of feeding tests intended to determine the best and safest methods of utilizing cotton-seed products as food for milch cows.

In relation to fertilizers and fertilizer materials:

Bulletins No. 2, Vol. I., 1888; No. 1, Vol. II., 1889. Notes on Fertilizers and Fertilizer Materials. Containing, besides the tabular statements of the analyses made by the Chemist of the Station, a discussion of the sources of materials, their value as fertilizers, and the best methods of compounding them for given crops, etc.

(The law of the State regarding the sale and inspection of fertilizers, passed March 24th, 1883, was amended by the Act of April 5, 1889. During the two years 1889-'90, no fertilizer analyses were made by the Station for the State).

During the years 1891, 1892, and 1893, one hundred and sixty-eight analyses of fertilizers have been made of samples furnished by the State Bureau of Agriculture. These analyses are published by the Bureau.

In relation to certain special crops:

The Peanut Crop; Statistics, Chemistry, and Culture. Bulletin No. 2, Vol. IV., 1891. Analyses of the several parts of the plant, with suggestions as to proper fertilizers and their application.

The Potato Crop. Diseases of the Irish Potato. Bulletin No. 2, Vol. II., 1889. Bulletin No. 1, Vol. III., 1890.

In relation to fruits and vegetables:

Six bulletins have contained reports as to variety tests, methods of cultivation, diseases, and their remedies, etc.

In relation to grasses and forage plants:

Four bulletins, devoted exclusively to the grasses of Tennessee worthy of cultivation for meadows and for pasturage, and including among the number Part I. of "The Grasses of Tennessee," a work soon to be followed by a carefully prepared and fully illustrated work on all the grasses found in the State.

In addition to the above there have been issued bulletins on fungous diseases of plants and the use of remedies therefor; on economic entomology; on the comparative value of home-grown feed stuffs, etc., etc. A list of bulletins so far issued is appended to Bulletin No. 4, Vol. VI., 1893.

The publications above referred to are, in fact, reports of progress. No single one of the subjects studied has been exhaustively treated. It has been the policy of the Station management to make no publications except of facts ascertained, and then only the facts, and scrupulously to avoid any statement of conclusions unless fully justified. To gather and classify facts concerning any one of the many animal and vegetable industries, in sufficient number and with such accuracy as to enable us to understand their meaning, think out their causes, and therefrom suggest, with any degree of confidence, that certain results will follow from certain things to be done, is an arduous labor. Patient endeavor in the search for truth is demanded of every Station worker.

Arrangements have been made for scientific and practical investigation during the coming year in co-operation with the State Bureau of Agriculture. The lines of work agreed upon are those regarded both by the Commissioner and the Station as promising valuable assistance to the farmers of the State.

It is proper here to state that by direct correspondence with those who make inquiries about particular subjects, whether purely scientific in character or of a practical nature, the heads of Divisions have been able to render much service to a large and increasing number of farmers, horticulturists, and others who are interested in special agricultural industries. Although such correspondence is a severe tax upon the time of the members of the staff, the work is justly regarded as duty to be promptly discharged.

Respectfully submitted,

(Signed)

CHAS. W. DABNEY, JR.,

President.

BOTANICAL DIVISION.

DR. CHAS. W. DABNEY, JR., *President*:

DEAR SIR:—I have the honor to present herewith a report of the botanical operations of the Agricultural Experiment Station for the calendar year ending December 30th, 1893.

The work of the year has chiefly been in the line of systematic botany, having in view the acquisition of a wider and more exact knowledge of the flora of the State.

Field Work.—Early in the season field work was organized, and assistants were detailed to make observations and collect plants. Mr. S. M. Bain was employed to carry on this work in the extreme western part of the State, and a member of the Station force was sent out to various points in upper East Tennessee. His work was discontinued July 1st, but much valuable material had been collected and many observations of interest made.

Additions to the Herbarium.—Work on the herbarium has been steadily carried forward. All the specimens in hand, excepting a portion of the collections of the past summer, have been mounted and put in the cases provided. Some three hundred species were gathered in West Tennessee by Mr. Bain, and nearly an equal number have been added from East Tennessee. Among these plants are many new to our collections, and between thirty and forty new to the State flora. Additions to the Mycological collection have been made by the purchase of the published sets of Ellis' "North American Fungi" and Seymour's "Economic Fungi." During the year two hundred and fifty sheets of grasses have been added to the herbarium, one hundred and fifty of which were species belonging to the State. The total number of mounted sheets of grasses in the herbarium is now thirteen hundred and sixty. This does not include nearly two hundred sheets prepared by the botanist for the World's Fair and exhibited in the college division of the Co-operative Exhibit of Agricultural Colleges and Experiment Stations. This collection has been returned to the Station, together with the wing-frames in which it was displayed.

Grass Work.—Much time has been spent in the preparation of a complete illustrated and descriptive manual of the grasses of the State, and the work on this is now well advanced. Every species, about one hundred and sixty, is being figured from carefully

selected specimens. The illustrations will all be original, and the figures of many of the species shown will here appear for the first time, giving added value to the work. This will be the first attempt of its kind in this country, and it is hoped that, with its aid, any one interested can determine almost at a glance the grasses of our fields and woodlands.

Owing to the position of the botanist, he is obliged to answer, when possible, all questions of a botanical nature, or determine specimens sent him for examination. Many collections of grasses from various parts of the country have been sent to him for determination, work which has involved much time and close and careful study.

The facilities at hand for determining the character of grass-seed and the possible amount and nature of the impurities or adulterations, are ample for the work, and I would urge the importance of some measures being taken whereby our retail seedsmen may have their stock submitted to a careful examination by the Station, as fertilizers now are, for the protection of themselves and those who may purchase from them.

World's Fair Work.—In addition to the collection of grasses above referred to, the botanist prepared and placed on exhibition in the Station exhibit of the Co-operative Exhibit of Colleges and Stations, an illustrative display of the diseases of the grape. The botanist was detailed during the month of June, to act as demonstrator in the botanical laboratory of the Co-operative Exhibit, and to make a display of photographs and photographic appliances used in botanical work. Special pieces of apparatus were designed by the botanist and made by the Station to carry out this object.

Respectfully,

(Signed)

F. LAMSON-SCRIBNER,

Botanist.

CHEMICAL DIVISION.

DR. CHAS. W. DABNEY, JR., *President* :

DEAR SIR :—The following report of the work of the Chemical Division of the Experiment Station for the year 1893 is respectfully submitted :—

Work on a study of the virgin soils of the State was continued, but, unfortunately, was much delayed by the unavoidable absence of the assistant chemist. Chemical analyses of six samples of soil were completed. A compilation of analyses of southern food-stuffs was undertaken and is now nearly ready for publication.

Partial analyses were made of twenty-two samples of milk from the Station dairy. Two samples of ensilage from the Station farm and one sample of ship-stuff were analyzed. Qualitative tests of several mineral specimens and one soil were also made.

During the year, eighty-nine samples of fertilizers were analyzed; eighty-six of them, received from the Commissioner of Agriculture, were for the State inspection of fertilizers. The other three were made for private parties. Samples were received during the months of May, June, July, September, October, November and December. From May 1st until July 15th, Mr. C. C. Moore, Jr., had charge of the fertilizer work, and made analyses of all samples received during that time. On September 1st, Mr. C. A. Mooers was put in charge of the fertilizer work, and since that date has made analyses of all samples received. A small room adjoining the Station laboratory has been fitted up at the expense of the Station for the fertilizer work, and is now used exclusively for that purpose.

Much time was consumed during the fall in giving the laboratory a thorough cleaning, which was sadly needed. A number of new and more convenient pieces of apparatus were put in place, and all apparatus already in use was thoroughly cleaned and repaired. Earlier in the year a complete inventory of the contents of the laboratory was carefully made, recorded in a suitable book, and filed with the Station papers. The laboratory is now in better condition for carrying on good work than it has been for a long time, and by the judicious expenditure of but little money may be put in a strictly first-class condition.

The analytical work may be summarized as follows:

Samples of fertilizers.....	89
Samples of soil (chemical analyses).....	6
Sample of soil (qualitative analysis).....	1
Samples of ensilage	2
Sample of ship-stuff.....	1
Samples of milk.....	22
Samples of minerals (qualitative analyses).....	6

The additional apparatus and supplies purchased during the year for the Chemical Division consisted of chemicals and apparatus for general laboratory use.

Respectfully submitted,

(Signed)

J. B. McBRYDE,

Assistant Chemist.

REPORT OF THE HORTICULTURAL DIVISION.

DR. CHAS. W. DABNEY, JR., *President*.

DEAR SIR:—The following report of the work of the Horticultural Division of the Experiment Station for the year 1893, is respectfully submitted.

SMALL FRUITS.

The Division of Horticulture has devoted considerable attention to the production of small fruits. Nearly a hundred varieties of strawberries, raspberries, blackberries, gooseberries, and currants were planted in the Station garden in March, 1892. Thorough cultivation was given the plantation, and most of the varieties made a vigorous growth and were in good bearing condition when the fruiting season of 1893 arrived. Of the small fruits, the strawberry has received the most attention. Bulletin No. 3, Vol. VI, 1893, contains data on the annual production of strawberries in different sections of Tennessee, adaptability of soils, preparation of the soil, setting the plants, systems of cultivation, varieties, sexuality, and five plates illustrating the varieties which proved most satisfactory in our test. This same bulletin briefly discusses the investigations made with raspberries and blackberries.

GRAPES.

The vineyard of about three hundred and fifty vines, located on the Station grounds at the University, has been given proper attention. Most of the young vines have made a strong and healthy growth. Thirteen varieties fruited the past season, notes on which, with plate illustrating the Agawam, were published in the July bulletin. The vines have been trained according to the double arm system and kept entirely free from disease through the frequent use of fungicides. Good results may be expected from this plantation.

THE ORCHARD.

We had hoped to publish a bulletin upon the fruiting qualities of the Station orchard for 1893, but with the undesirable exposure of the location, and severe weather of the previous winter, we have been disappointed in this line of work. Most of the trees are too young to yield very abundantly, but if weather conditions are favorable, a fair crop will doubtless be harvested the coming season.

TOMATOES.

The October bulletin contained a full report of experiments conducted with tomatoes in the Station garden the past season. Work with this important vegetable has been in progress for three years. The objects of investigation have been value of different fertilizers, depth of setting plants, methods of pruning and training, and variety tests.

ONIONS.

The bulletin published in October also contained a chapter relative to our work in the cultivation of onions. For two seasons a special study has been made of various cultural methods in the production of onions. After the bulbs had grown to about one-fourth the matured size, fungus foes attacked them which proved most disastrous to our crop. Next year our investigations will be continued upon a more extensive plan.

A NEW FRUIT PLANTATION.

Under the direction of the Secretary of the Station a series of terraces is being graded on the Station farm with a view to establishing a new fruit plantation. The plat selected slopes to the northeast and is admirably adapted to fruit culture in this climate. One terrace was planted in November with thirty-six Bartlett pear trees. The other terraces, when completed, will be planted with pears and grapes. Strawberries will also be cultivated on the terraces planted in pears until the trees begin to fruit.

THE STATION GROUNDS.

Our efforts to embellish the Station grounds with ornamental plants and trees have been continued. This work is important, not for ornament only, but that data thus secured may enable the Station to give valuable information upon the various plants and trees which are found worthy of cultivation for this purpose.

THE GREENHOUSE.

The greenhouse has been almost exclusively devoted to the culture of flowers and decorative plants. The structure is very much decayed, and it is respectfully suggested that a new one be erected during the coming summer. It is absolutely impossible to conduct accurate experimental work in the present house, when the conditions are such that the temperature cannot be controlled.

Respectfully,

(Signed)

R. L. WATTS,
Horticulturist.

REPORT OF THE FOREMAN OF THE FARM.

PROF. CHAS. F. VANDERFORD, *Secretary and Agriculturist* :

DEAR SIR:—I have the honor to submit the following general report of the work done on the Station farm during the year 1893:

A record of every operation is made, in addition to the daily account of affairs entered upon the farm journal. In this way we accumulate a store of valuable information which can be drawn upon at will.

The subjects given special prominence in the way of investigation during the year, were a continuation of experimental work in cattle feeding, some of the results of which were given in Bulletin No. 2, Vol. VI, 1893; a continuation of work in the experimental grass garden; the growing of soiling crops, and crops for ensilage, grain, and fodder.

With a single exception (*agropyrum tenerum*) the grasses on the several plats in the garden stood the winter of 1892-'93 and the droughts of the fall of 1893. The seeds used were obtained from one of the most reputable dealers. To have the plats pure and true to name, they were weeded by hand when the grasses were in bloom, leaving only such as belonged to each plat. When this work was finished, some of the plats had but few plants remaining. We are thus shown how difficult it is to obtain pure seeds of grasses. We have now on hand seed gathered from our own plats which will be used to enlarge the garden and so enable us to furnish for distribution seeds and roots true to name.

During the year fourteen native cows were purchased for the dairy herd. A record of the milk produced, together with the tests thereof for butter fat, show that carefully selected natives can be so managed as to be profitable, and that by topping these cows with a pure bred Jersey, it is easy to build up, and very rapidly, a herd of superior merit both for quantity and quality of milk and butter.

The subject of dehorning cattle is being carefully investigated; both the dehorning of grown animals, and, by proper and painless means, the prevention of the growth of horns, by treatment of the young calf. The results will be reported in due time.

The general policy on the management of the farm is to make it, as nearly as possible, self-sustaining, increase its fertility, and

bring every part of it into best possible condition. The methods used are such as any farmer can adopt, and demonstrate that every crop grown for use on the farm can be used so as to show a profit above the cost of production. The purely experimental work is not expected to be directly profitable, and cannot be.

The condition of the buildings on the Station farm demand some notice. They are old and ill-constructed. The roofs on the barn, tool-house, and sheds do not protect the grain, tools, and stock placed in them for shelter.

The supply of pure water is insufficient. Third Creek, our dependence for stock water, is part of the time so polluted with dye-stuff and waste from the woolen mills that stock refuse to drink it.

Much of the farm machinery and implements must be replaced at an early day.

Respectfully,

(Signed)

THOS. E. PECK,

Foreman.