

FOURTH ANNUAL REPORT

OF THE

AGRICULTURAL EXPERIMENT STATION.

OF THE

A. & M. College,

Auburn, Alabama,

JANUARY 26, 1892.



MONTGOMERY, ALABAMA:
BROWN PRINTING CO., PRINTERS, BINDERS AND STATIONERS.
1892.

AGRICULTURAL AND MECHANICAL COLLEGE,
AUBURN, ALA., January 26, 1892.

To Governor THOS. G. JONES,
Executive Department,
Montgomery, Ala.

Sir—I have the honor herewith to transmit to you the Annual Report of the Agricultural Experiment Station of the Agricultural and Mechanical College of Alabama, for the year 1891.

This report is made in accordance with the provisions of the act of Congress establishing the Experiment Stations in the different States and contains the report of the Treasurer, the Chemist, the Botanist, the Biologist, and the Agriculturist.

Very Respectfully,
WM. LEROY BROUN,
President.

OFFICERS
OF THE
Agricultural Experiment Station,

◆ Board of Visitors ◆

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N. T. LUPTON Chemist.
P. H. MELL Botanist.
G. F. ATKINSON Biologist.

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J. T. ANDERSON First Assistant Chemist.
L. W. WILKINSON Second Assistant Chemist.
J. F. WILKINSON Third Assistant Chemist.
R. E. NOBLE Fourth Assistant Chemist.
G. S. CLARK Clerk and Assistant Botanist.

*Prof. Mell has charge of Meteorological Observations.

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TREASURER'S REPORT.

For the fiscal year ending July 1st, 1891.

THE AGRICULTURAL EXPERIMENT STATION OF THE
A. & M. COLLEGE OF ALABAMA,
In account with U. S. Treasurer.

RECEIPTS.		
To Amount from U. S. Treasurer		\$15,000 00
DISBURSEMENTS.		
By amount paid	Contingent.....	\$ 221 64
	Dairy	1,414 69
	Botany	148 39
	Library.....	639 36
	Salaries.....	9,712 50
	Printing	947 34
	Building	750 00
	Chemical Department.....	255 90
	Stationery	71 67
	Postage	93 61
	Biology	713 10
	Soil Test	31 80
		\$15,000 00

E. T. GLENN, *Treasurer.*

A. & M. COLLEGE.

THE STATE OF ALABAMA, }

LEE COUNTY. }

Personally appeared before me, F. M. Reese, a Notary Public in and for said county and State, E. T. Glenn, known to me as Treasurer of the Agricultural and Mechanical College of Alabama, who being duly sworn, deposes and saith that the above and foregoing account is true and correct.

Witness my hand this 22d day of January, 1892.

F. M. REESE, *Notary Public.*

This is to certify that I have compared the above Account with the Ledger Account of the Treasurer, and this is a correct transcript of same.

WM. LEROY BROWN, *President.*

A. & M. COLLEGE.

DEPARTMENT OF CHEMISTRY.

—••—
N. T. LUPTON.
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The analysis of fertilizers has occupied a large portion of the time of the Chemist and his assistants during the past year. An act passed by the last Legislature and which went into operation on the 1st of September, requires the Commissioner of Agriculture to secure samples of each and every brand of fertilizers offered for sale in the State, and have the same analyzed by the State Chemist. Publication of the results must be made annually on or before the first of September. In addition to these analyses, farmers and others are authorized, as heretofore, to draw samples of fertilizers purchased from manufacturers and dealers and have the same analyzed free of cost. The effect of the act mentioned, is likely to add materially to the work of the Chemical Department, as these analyses will not prevent farmers from having the same brands re-analyzed as often as purchases are made.

The character and exhibit of the work done can be seen from the following tabulated statement of the number and variety of analyses made during the year :

QUANTITATIVE ANALYSES MADE IN THE STATE LABORATORY DURING THE YEAR 1891.

	No. of Analyses.
Acid Phosphates with Nitrogen and Potash.....	182
Acid Phosphates with Potash	11
Acid Phosphates	82
Natural Guanos	10
Natural Phosphates... ..	36
Marls.....	3
Soils.....	8
Tankage.....	16

Cotton Seed Meal	14
Feed Stuffs	15
Milk	28
Butter	13
Miscellaneous Substances	28
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Total	446

The miscellaneous substances include Bone Meal, Bone and Blood fertilizers, Sodium Nitrate, Muriate, Kainit, Dried Blood, Ashes, Cave Earth, Clay, Sulphate of Potash, Mineral Waters, etc.

In addition to the quantitative work, a large number of mineralogical specimens, the character of which could be ascertained by mere inspection, or simple quantitative tests, were examined and their value determined.

The above tabular statement embraces work done for both the Experiment Station and for the State Department of Agriculture. The station work includes sixty-seven analyses, embracing milk, butter, feed stuffs, soils, etc. The results have been published in bulletins issued from the station and by the State Commissioner of Agriculture.

An investigation of the effect produced on milk and butter by the feeding of cotton seed and cotton seed meal, was commenced in November, 1890, and completed in the early part of the year just closed. The results are contained in Bulletin No. 25, which was published in April.

The fact was established by these experiments that cotton seed and cotton seed meal increase, in a marked degree, the melting point of butter and diminish to a corresponding extent, the volatile acid, while the specific gravity remains virtually unaltered. The belief generally prevails that the character of the butter produced is not materially altered by the feed stuff used. Since the publication of the bulletin referred to, other investigators have confirmed the results obtained at this station.

There are other questions in reference to milk and butter which it is proposed to investigate during the present year.

ANNUAL REPORT OF THE BOTANIST.

Dr. Wm. LeRoy Broun,

President A. & M. College;

SIR—The work of the year in the Department of Botany, has been conducted along the following lines :

1. Experiments on thirty "varieties" of cotton to determine (a) whether they are really varieties or simply the common forms in an improved condition; the results of careful cultivation; (b) To determine what steps are necessary for securing the best quality of fibre as well as the best condition of seed. Leading to these desired results, I began the past year a series of cross cultivations with all the so-called varieties grown on the college farm, and succeeded in securing something over one hundred well matured bolls from fertilizations made at different dates and under different conditions of the weather. The seed from these bolls have been carefully examined and selected, and they will be planted the coming season under special care.

2. A Botanical Survey of the State has been commenced and will be prosecuted as rapidly as possible until the entire State is surveyed. Specimens of plants from Lee and several other adjoining counties have been collected, named and classified. A catalogue of the State is under way.

3. Experiments on woods—specially relating to economic questions—have been conducted during the year and much data collected for a future bulletin.

4. The weeds of Alabama have been studied, and a catalogue partially prepared. A bulletin on this subject is nearly ready for publication.

5. Meteorological observations have been regularly made each day throughout the entire year and a bulletin was issued each month, besides the weather and crop reports made each week during the crop season from April to November.

Very respectfully submitted,

P. H. MELL,

Botanist.

REPORT OF THE BIOLOGIST

—OF THE—

EXPERIMENT STATION FOR THE YEAR 1891.

Dr. Wm. LeRoy Broun,

President Board of Direction:

SIR—I present herewith the following report for this department for 1891 :

One bulletin has been published, entitled "Black Rust of Cotton," No. 27, May, 1891, in which were described some fungus organisms accompanying that widespread disease.

Experiments have been carried on this year to determine more fully the nature of the disease and if possible a remedy. Several have been conducted at Auburn, and also at Hope Hull, Ala., with the co-operation of Mr. A. H. Clark, and at Mathews Station with the co-operation of Mr. S. B. Mathews. These experiments have been very instructive, have given a much clearer insight as to the true nature of the disease as well as to indicate the course of procedure in preventing it. The report on this work is now nearly ready for publication and will be presented as one of the regular bulletins of the Station.

A popular exposition of the following subjects of economic importance have been published in the *Agricultural Journal*, Montgomery :

1. Cotton rust. January, Vol. II No. 3; February, No. 4; May, No. 7.
2. A new root rot disease of cotton. March, No. 5.
3. Fig rust. April, No. 6.
4. Notes on some insect and fungus diseases. June, No. 8.

5. The root gall nematode in the lime lands. August, No. 10.

6. Frenching. August, No. 10.

7. Additional notes on Frenching. September, No. 11.

8. A cotton cut worm. September, No. 11.

9. A season's observations on Frenching. October, No. 12.

10. The organisms which collect nitrogen for leguminous plants. December, No. 14.

A paper on "Some diseases of the cotton plant" was read before the Botanical Section of the American Association of Agricultural Colleges and Experiment Stations, at Washington in August.

Papers were read before the Association of official Entomologists as follows:

1. A cotton cut worm.

2. A nematode leaf disease.

One paper on the "Structure and Dimorphism of *Hypocrea tuberiformis* B. and Rav." was read before Section F. of the American Association for the Advancement of Science, at Washington.

Two papers were read before the Botanical Club of the American Association for the advancement of Science, as follows:

1. The perfect stage of *Cercospora gossypina* Cke.

2. Root galls of *Ceanothus*.

Articles of economic and scientific importance have been published in the *Botanical Gazette*, as follows:

1. Black rust of cotton.

2. The Station Botanists at Washington. September, 1891.

3. The structure and dimorphism of *Hypocrea tuberiformis*. October, 1891.

4. A new *Ravenelia* from Alabama. November, 1891.

In the *Bulletin of the Torrey Botanical Club*, a paper was

published on the perfect stage of "Cercospora gossypina Cke." October. 1891.

An article was published in the Journal of the Elisha Mitchell Scientific Society, Vol. VII, No. 2, 1891, on a group of parasitic fungi, some of which are of considerable economic importance, entitled "Some Erysipheæ from Carolina and Alabama."

An article is now in press for the same Journal entitled "Some Cercosporæ from Alabama." This is a large genus of parasitic fungi, some of which are of great economic importance. In this article 79 species are enumerated which have been collected in Alabama within the past two years. 28 of these are new to science, one is an European species and one a South American species noted in this country for the first time.

Besides, a large amount of material consisting of parasitic fungi, representing many diseases of grasses, woody plants, and herbs, has been collected and added to the biological cabinet.

A plant house is in course of erection, where it is hoped, by careful cultures of cotton and other plants, much valuable information may be gained regarding the mysterious diseases which greatly reduce the product of the planters.

The rooms of the department are becoming crowded with material, and a small room adjacent is much needed where specimens of diseased plants mounted for class, and other exhibitions, can be kept on hand. It is also very desirable that some exsiccatae of economic fungi which are very valuable for reference in working out properly the forms found in our own State, should be purchased and placed at the disposal of the department.

Respectfully submitted,

GEO. F. ATKINSON,

Professor of Biology, and Biologist of the Experiment Station.

JANUARY 16th, 1892.

AUBURN, ALA., January 26th, 1892.

Dr. Wm. LeRoy Broun,

President Board of Direction:

SIR—Prof. J. S. Newman, Agriculturist of the Experiment Station, having resigned his position January 1st, 1892, I have the honor to submit a summary of the farm experimental work of the Station during the year 1891.

Very respectfully,

JAMES CLAYTON,
Assistant Agriculturist.

REPORT OF THE AGRICULTURIST.

Since the last annual report, nine bulletins have been printed and issued to the farmers of the State, showing the experimental work in Agriculture done at the Station. These bulletins are numbered 23, 28, 29, 30, 31, 32, 33, and 34.

[Bulletin No. 23.]

CO-OPERATIVE SOIL-TESTS.

This bulletin contains the results of the experiments made by twenty-nine (29) farmers residing in different sections of the State, with the special fertilizers provided by the Station. They were all made under direction of the Experiment Station, and were designed to determine the adaptation of fertilizers to the different sections of the State. Their publication has excited interest, and been of value.

[Bulletin No. 28.]

WATERMELONS AND CANTALOUPE.

This bulletin contains results of experiments in nineteen (19) varieties of Watermelons, and twenty-five (25) of Cantaloupes. Also a comparison of yield from seed taken from the different parts of the melon, with interesting results. The best results were from seed taken from the centre of the melon. As to the varieties tested, for home and market use, the Jones melon ranks first—not quite as good for shipping as the Kolb Gem, but superior in quality. The Sugar Loaf and Cuba, give great satisfaction for home consumption.

[Bulletin No. 29.]

GRAPES, RASPBERRIES AND STRAWBERRIES.

This bulletin gives valuable information in Grape, Raspberry, and Strawberry culture, with data taken from observations made during the past six years.

[Bulletin No. 30.]

APPLES, PEARS, PEACHES AND PLUMS,

This bulletin presents conclusions drawn from six years observations of forty-five varieties of Apples, forty of Pears, and thirty-seven of Peaches, and a comparison of the longevity of the Wild Goose plum grafted upon different stocks.

[Bulletin No. 31.]

IRISH AND SWEET POTATOES.

In this bulletin results are given of the experiments made in different methods of applying fertilizers to Irish potatoes; a comparison of the yield in whole and cut seed, and different modes of cultivation. The yield of sweet potatoes from plants obtained from large and small seed, is compared, with results in favor of large potatoes for seed.

[Bulletin No. 32.]

CORN, WHEAT AND OATS.

This bulletin contains a comparison of eighteen varieties of Corn, fourteen of Wheat, and two of Oats. Also some experiments in top-dressing wheat and oats, with different fertilizers, which will be of value to the farmers of the State.

[Bulletin No. 33.]

COTTON.

A comparison of twenty-eight varieties of cotton, with a tabulated statement showing yield of seed-cotton per acre, per cent. of lint, and length of staple: also a comparison of the yield of cluster and long limbed varieties at different distances, will be found in this bulletin.

A test of the Gullett and Pratt Gins, is also reported.

[Bulletin No. 34.]

CO-OPERATIVE SOIL-TESTS OF FERTILIZERS.

This bulletin gives a report of soil tests of fertilizers, conducted by farmers in the following thirty-nine counties, viz: Two in Autauga, one in Barbour, Bibb, Blount, Bullock, Butler, Calhoun, Chilton, Choctaw, Clarke, Clay, Covington, Cullman, Dale, Elmore, Etowah, Fayette, Franklin, Geneva, Greene, Hale, Henry, Lauderdale, Lawrence, Limestone; two in Lowndes, one in Madison, Marengo, Marion, Monroe, Morgan, Perry, Pike, Randolph, Russell, Shelby, St. Clair, Tallapoosa, and Washington. In the spring of 1891, a collection of grape, raspberry and strawberry plants was sent, free of cost, to each experimenter, and in the fall, a peck of wheat for trial, was also sent for future report. These experiments have proved of great interest and benefit to the farmers of the sections in which they are made.

