

FIFTH ANNUAL REPORT

OF THE

AGRICULTURAL EXPERIMENT STATION.

OF THE

A. & M. COLLEGE,

Auburn, Alabama.

JANUARY 20, 1893.



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ALABAMA POLYTECHNIC INSTITUTE,
A. & M. COLLEGE,
AUBURN, ALA., January 20, 1893.

To Governor THOS. G. JONES,

Executive Department,

Montgomery, Alabama:

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 1892.

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 Agriculturalist and the Veterinarian.

Very respectfully,

WM. LEROY BROWN,

President.

BOARD OF TRUSTEES.

His Excellency, THOMAS G. JONES, President.....Ex-officio.
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*.....	Biologist.
C. A. CARY, D. V. M.	Veterinarian.

ASSISTANTS:

JAMES CLAYTON.....	Assistant Horticulturist.
A. F. CORY†.....	Assistant Agriculturist.
J. T. ANDERSON, Ph. D.....	First Assistant Chemist.
L. W. WILKINSON, M. Sc.....	Second Assistant Chemist.
F. A. LUPTON, M. Sc.....	Third Assistant Chemist.
R. F. HARE, B. Sc.....	Fourth Assistant Chemist.
G. S. CLARK.....	Clerk, and Assistant Botanist.

* To be filled.

† In charge of Soil-Test Experiments.

TREASURER'S REPORT.

For the fiscal year ending July 1st, 1892.

THE AGRICULTURAL EXPERIMENT STATION OF THE

A. & M. COLLEGE OF ALABAMA,

In account with U. S. Treasurer.

HATCH FUND.			
RECEIPTS.			
To amount from U. S. Treasurer			\$ 15,000 00
DISBURSEMENTS.			
By amount paid salaries	\$ 8,335 35		
Building	750 00		
Postage	50 00		
Field Experiments	313 87		
Printing	620 45		
Experiment Station	3,055 57		
Chemical Department	450 00		
Stationery	91 52		
Traveling expenses of officers	211 29		
Incidental	139 75		
Library	477 08		
Equipment of plant house	505 12	\$ 15,000 00	

E. T. GLENN, *Treasurer,*

A. & M. COLLEGE.

THE STATE OF ALABAMA, }

LEE COUNTY. }

Personally appeared before me, W. S. J. Lampkin, 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 the 13th day of January, 1893.

W. S. J. LAMPKIN, 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, CHEMIST.

During the past year, the chemist and his assistants have spent much of their time in the analysis of commercial fertilizers. Bulletin, No. 38, was published in July, giving the results of analyses made from April 1st, 1891, the date of the previous report, to July 1892, the date of the bulletin mentioned. The Commissioner of Agriculture being anxious to supply farmers with the analyses of all brands of fertilizers to be sold in the State during the present season, called on manufacturers to forward samples promptly that analyses might be made by the first of January and the results published immediately thereafter. From the date of this call, about four months ago, to the present time, two hundred and forty-five samples have been received, of which, one hundred and forty-six have been analyzed and the results reported.

The Commissioner is required by law to have this work done by the State chemist and the results published on or before the first of September of each year. There is an obvious advantage in having the analyses completed and publication made at the beginning of the year, as the farmer can then use the results as a guide in making purchases. Samples of these same fertilizers will, in all probability, be sent for re-analysis as soon as they come into the hands of farmers and dealers, as, according to law, every purchaser has a right to draw samples of purchases made and forward them to the Commissioner of Agriculture for transmission to the State Chemist,

who is required to analyze the same free of cost. If the samples fail to give results equal to the guaranteed analysis printed on each sack, the purchaser is released from legal obligation to pay for the goods. This repetition of analyses of the same fertilizers, adds greatly to the labor of the State Chemist, but it undoubtedly furnishes protection to farmers against fraudulent mixtures, and acts as a restraint on manufacturers who may be disposed to exaggerate the percentage of valuable constituents in their fertilizers. Samples thus far analyzed, the present season, come up to the guarantees in almost every instance.

The constitution of Alabama forbids the employment of inspectors to take samples of fertilizers after they have come into the state, except with the consent of the owner, and hence the Commissioner of Agriculture and State Chemist can take only such samples as the manufacturer or purchaser is willing to allow. There are no inspectors as in other states, the constitution, just quoted, forbidding inspections of all classes of goods by State officers.

In addition to the analysis of manufactured fertilizers, many specimens of natural phosphates, marls, minerals, soils, mineral waters, etc., have been analyzed.

The above-mentioned bulletin, No. 38, which was published in July, contains a brief discussion of the use and valuation of fertilizers, including natural phosphates.

Experiments were carried on during the year at the Agricultural Station, under direction of the Chemist, and at the same time in the chemical laboratory, to ascertain the relative agricultural value of non-acidulated, pulverized Florida phosphates and South Carolina floats, as compared with acid phosphates, and also the effect of decomposing organic matter, such as cotton seed and cotton seed meal, on these natural phosphates. The farm experiments gave as good, if not better results from the use of non-acidulated material, as from that treated with sulphuric acid. These experi-

ments will be continued the present season, as it is evident that if the results can be established, the question of cheap phosphates will be solved and the farmer be enabled to purchase fertilizers at a much less cost than at present.

The experiments carried on in the laboratory failed to show that the fermentation of organic matter—cotton seed and cotton seed meal—converts an appreciable amount of insoluble into soluble phosphates. It is probable that plants take in the so-called insoluble, or acid soluble phosphate, from soil water containing carbon dioxide, or organic acids produced by decomposition of organic matter, which have the power of dissolving a portion of such phosphates. The details of experiments made, will be published in a bulletin at an early day, and the experimental work will be continued.

Analyses of typical soils from different parts of the State are now under way and will soon be completed. These soils, accompanied with analyses, are to be placed on exhibition at the Columbian Exposition, and will constitute a part of the collection to be made by Dr. Hilgard, who has been commissioned to superintend similar exhibits of soils from every State in the Union.

REPORT OF THE BOTANIST.

Dr. Wm. LeRoy Brown,

President A. & M. College:

SIR.—I have the honor to submit the following report of the work in the Department of Botany during the past year:

The experiments upon cross fertilization of cotton have been continued through the past crop season, and much valuable material has been secured relating to the improvement of the character of the fiber and the determination of the number of species cultivated in the South. Several hundred slides for microscopic study have been made, showing the various stages of development of the fibre, and changes imparted to the pollen grains and seeds. A successful cross was secured between the garden okra (*hibiscus esculentus*) and the cotton plant. The past season has yielded the first plants from this blending of the two genera, and some interesting features have been brought out. In the planting of the seed, of all samples under study, special care was exercised to prevent the interference of types through the agency of insects, wind, etc., and every precaution was taken to secure well established types. A large number of microscopic studies have been made and photo-micrographs prepared to illustrate a bulletin that is nearly ready for the printer.

The botanical survey of the State has made some progress during the year. Mr. George S. Clark, the assistant in the department, spent a portion of the summer in North, Middle and Southern Alabama, collecting specimens of plants, and much valuable material has been secured. He has

been employed during the winter months in naming, classifying and cataloguing these specimens. In this work he has been assisted by Mr. W. E. Richards, a post-graduate student, who has been prosecuting his studies in botany during the year. During the excursions in the State, Mr. Clark made some valuable collections of grasses for the World's Fair at Chicago. These grasses have been named, mounted and forwarded to Prof. Tracy, the committeeman having in charge the Division of Botany in the Experiment Station exhibit. Some botanical specimens have been sent to various parts of the country in exchange for plants from other States. Among the exchanges thus made, I will mention a fine collection of five hundred specimens received from a botanist in Liverpool, England. The herbarium has been largely increased during the year from various sources.

The work in meteorology has been continued throughout the year, and considerable improvement has been made, both in the facilities for work and in equipment at the Central Station at Auburn, and also at the forty-two stations established in different parts of Alabama. A large amount of data is on file in the office for future study, and several important problems relating to climatology are now being solved from the large accumulation of facts thus collected by the intelligent observers over the State. The regular monthly bulletins and the weekly crop bulletins have been issued without a break. Daily observations have been taken at the Auburn station concerning the condition of the weather, and the following instruments have been used for the purpose: Maximum and minimum thermometers, hygrometer, terrestrial thermometer, soil thermometers (thirty-six in number), barometer, anemometer, anemoscope and rain gauge. The work of observing these instruments has been performed by W. D. Clayton and E. B. Mell. In the preparation of the bulletins and in other matters relating to

the weather service, I have been greatly assisted by Dr. J. T. Anderson, of the Chemical Department. During the year I have prepared a brochure on the "Climatology of the Cotton Plant," at the special request of the Chief of the Weather Bureau, and this work is now passing through the printing department of the Bureau at Washington. The work will comprise one of the series requested of the Chief by the American Association of Agricultural Colleges and Experiment Stations at its session in Washington City.

The Station reading room, under my supervision, is now receiving one hundred periodicals, through subscription and exchange, representing the leading journals of science, American and foreign. Nearly one hundred volumes have been bound and placed on the shelves in a convenient form for reference. Mr. Clark is in charge of this room and it is kept open all day for the use of the Station workers.

Very Respectfully,

P. H. MELL.

REPORT OF THE AGRICULTURIST.

A. J. BONDURANT, AGRICULTURIST.

Since the last annual report the following bulletins have been issued from the Agricultural Department of the Experimental Station.

[Bulletin No. 33.]

Experiments with cotton; comparison of varieties; comparison of varieties of Cotton on field scale and tests of Gins; cluster and long limbed varieties of cotton and distances.

Experiments with phosphate; phosphate alone and phosphate and nitrogen applied on new ground; reports of different kinds of cotton experimented with as a variety test.

[Bulletin No. 34.]

Co-operative soil tests; this bulletin contains the reports of the experiments made by 42 farmers living in different parts of the State with fertilizers compounded by the Experiment Station.

These experiments were made under the direction of the Experiment Station for the purpose of ascertaining the effect of fertilizers on the different soils of the State. The publication of these soil-test reports have excited much interest and it is thought that much benefit has resulted to the Agricultural interest from them.

[Bulletin No. 37.]

TOBACCO BULLETIN.

This bulletin was issued to meet the demand for information on this subject.

The following is an outline of the contents: Selection of tobacco seed; varieties of tobacco; plant beds; open air beds; sowing the beds; canvas covering for plant beds; frame for open air bed; the hot bed; when to sow tobacco beds; manuring the plants; transplanting the plants; preparation of the land; cultivation of the crop; cut and bore worms; topping and pruning; the horn worm; tobacco moth; remedy for the moth; suckers; cutting; tobacco barns; curing; curing English shipping; marketing.

[Bulletin No. 39.]

EXPERIMENTS IN WHEAT.

This bulletin contains experiments made to find variety of wheat best adapted to the soils and climate of this State, and approximate cost of raising wheat. This bulletin also contains some interesting reports of farmers, in different sections of the State who co-operated with the Experiment Station in this kind of work.

EXPERIMENTS.

The following is a list of experiments conducted on the station during the last year:

29	Experiments in grain.
30	“ with varieties of cotton.
24	“ “ fertilizers with cotton.
10	“ “ varieties of tobacco.
11	“ “ “ onions.
17	“ “ “ sweet potatoes.
15	“ “ “ Irish potatoes.
2	“ “ cantaloupes.
3	“ “ watermelons.
1	“ “ lathyrus sylvestris.
8	“ “ grasses.
40	“ cotton conducted for biologist.
25	“ cotton conducted for chemist.
84	“ cotton conducted for botanist.
2	“ cotton conducted for President of Board of direction.

In addition to the regular field experiments, feeding tests have been conducted in feeding dairy cattle.

BETTERMENTS.

Nine hundred and sixty rods of new fencing, and many new gates have been constructed, and during the spring of 1892, a ten horse power motor was placed at the Agricultural Station and connected with the dynamo of electricity at the dynamo room at the college. This power is used to run the cotton gin, threshing machine, ensilage cutter and feed mill.

In addition to the publications issued during the year from the station, the bulletin on cotton experiments is now in the hands of the printer.

The reports of the cotton soil tests have all been tabulated and the editing of the bulletin on the co-operative soil test is nearly completed.

The work of experiment in tobacco was in the main successful. The results have been reported in the Montgomery Advertiser and the Southern Cultivator.

To conduct successfully the tobacco experiment, it is necessary to have well constructed modern tobacco barns, with suitable curing apparatus.

Further information will be issued giving an account of the tobacco experiments and illustrating the methods that should be followed in this important industry.

REPORT

OF

DEPARTMENT OF VETERINARY SCIENCE.

SIR:—

The work of the Veterinarian, for 1892, was limited to the first three months of the year. During this time lectures were delivered, every Saturday, in the college chapel, for the special benefit of farmers and others interested in live stock. Following each Saturday lecture clinical instruction was given to the farmers and also to the students of the A. and M. College. The free clinic consisted of operations upon, and treatment of, all diseased animals brought to the Experiment Station by farmers and stock owners from the country and towns near Auburn. Lectures were also delivered at the Farmers Alliance Hall south of Auburn, at Opelika, at Alexander City and at Girard. The import of these lectures was to give the characters of, and modes of treating, the common diseases of farm animals and to impress upon the stock owner the importance of the sanitary and hygienic laws relating to the health of domestic animals; also to emphasize the fact that preventative treatment is far cheaper and better than curative remedies.

A bulletin on Glanders was, also, issued by this department. This bulletin embraced the pathology, causes, symptoms, diagnosis, the various forms of the disease, methods of disinfecting infected places, how to handle glandered animals, &c, &c. The chief aim of the bulletin was to familiarize farmers and stockmen with the prominent characters of

Glanders that they might recognize and distinguish it from other diseases and thus protect themselves and their stock from its ravages.

It is hoped that, by another year, this department will be suitably equipped for original investigation in animal pathology.

Respectfully,

C. A. CARY.

Veterinarian.

To Dr. WM. LEROY BROUN.

*President of Board of Direction
of Experiment Station.*