

EIGHTH ANNUAL REPORT

OF THE

# Agricultural Experiment Station

OF THE

A. & M. COLLEGE,

AUBURN, ALABAMA,

JANUARY 25TH, 1896,

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MONTGOMERY, ALA.:

ROEMER PRINTING COMPANY., PRINTERS AND BINDERS  
1896.



# AGRICULTURAL EXPERIMENT STATION.

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## COMMITTEE OF TRUSTEES ON EXPERIMENT STATION.

I. F. CULVER.....	Union Springs.
J. G. GILCHRIST.....	Hope Hull.
H. CLAY ARMSTRONG.....	Auburn.

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## STATION COUNCIL.

WM. LEROY BROUN.....	President.
P. H. MELL.....	Botanist.
B. B. ROSS.....	Chemist.
L. M. UNDERWOOD.....	Biologist.
C. A. CARY, D. V. M.....	Veterinarian.
J. F. DUGGAR.....	(Acting) Agriculturist.
F. S. EARLE.....	(Acting) Horticulturist.

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## ASSISTANTS.

J. T. ANDERSON.....	First Assistant Chemist.
C. L. HARE.....	Second Assistant Chemist.
R. G. WILLIAMS.....	Third Assistant Chemist.
T. U. CULVER.....	Superintendent of Farm.

 The Bulletins of this Station will be sent free to any farmer of the State on application to the Agricultural Experiment Station, Auburn, Alabama.

## TRUSTEES.

*His Excellency*, WM. C. OATES, President..... Ex-Officio.  
J. O. TURNER, Superintendent of Education..... Ex-Officio.

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I. F. CULVER..... Union Springs.  
J. C. RICH..... Mobile.  
H. CLAY ARMSTRONG..... Auburn.  
R. H. DUGGAR..... Gallion.  
J. G. GILCHRIST..... Hope Hull.  
WM. SMAW..... Boligee.  
C. C. HARRIS..... Decatur.  
JONATHAN HARALSON..... Selma.  
J. A. BILBRO..... Gadsden.  
THOMAS WILLIAMS..... Wetumpka.

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E. T. GLENN..... Treasurer.  
J. H. DRAKE, M. D..... Surgeon.

ALABAMA POLYTECHNIC INSTITUTE, A. & M. COLLEGE,  
AUBURN, ALA., January 25th, 1896.

To Governor WM. C. OATES,

*Executive Department,*

*Montgomery, Ala.*

DEAR SIR: I have the honor herewith to transmit to you the Eighth Annual Report of the Agricultural Experiment Station of the Agricultural and Mechanical College of Alabama.

The Report of the Treasurer is for the fiscal year ending June 30th, 1895.

This report is made in accordance with the provisions of the act of Congress establishing Agricultural Experiment Stations in the several States, and also contains the report of the Botanist, the Chemist, the Biologist, the Veterinarian, the Agriculturist and the Horticulturist, for the year ending Dec. 31st, 1895.

Very respectfully,

WM. LEROY BROUN,  
President.



# REPORT OF TREASURER.

TREASURER OF A. & M. COLLEGE,

In account with United States Appropriation Hatch Fund for  
the year 1894-1895.

To cash received from U. S. Treasurer for the fiscal year  
ending June 30th, 1895 .....\$ 15,000 00

Cr.

By Salaries.....	\$	8,700 00
“ Labor .....		968 17
“ Publications.....		682 21
“ Postage and Stationery.....		190 20
“ Freight and Express.....		282 23
“ Heat, Light and Water.....		245 14
“ Chemical Supplies .....		547 20
“ Seeds, Plants and Sundry Supplies.....		218 81
“ Fertilizers.....		348 00
“ Feeding Stuffs.....		257 19
“ Library.....		500 00
“ Tools, Implements and Machinery.....		105 44
“ Furniture and Fixtures.....		276 61
“ Scientific Apparatus.....		551 61
“ Live Stock.....		156 25
“ Travelling Expenses.....		278 42
“ Contingent Expenses.....		93 75
“ Building and Repairs.....		598 77—\$ 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 2d day of January, 1896.

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 BROUN,  
President A. & M. College.





# REPORT OF BOTANIST.

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*Dr. Wm. LeRoy Brown, President :*

SIR :—I have the honor to submit herewith the annual report of the work accomplished during the past year (1895) in the department under my charge.

Among the additions made to the department in 1895 may be mentioned :

1. Bernhard's Drawing table made by the Zeiss Optical Company of Germany.
2. Zeiss' New Mechanical Stage for microscope Ia.
3. Zeiss' Projecting eye-pieces.
4. Bausch & Lomb's microtome.
5. Bausch & Lomb's paraffin bath.
6. Folding Kodak with Clark's lens and Bausch & Lomb's diaphragm shutter, adapted for 4x5 glass plates as well as cut and roll films.
7. Colt's Automatic electric lamp to fit Colt's lantern already in the possession of the department.
8. 400 species of pressed plants from Alabama and Florida.

During the past season the following seeds were planted in the Botanical Garden and many notes were secured from the results of the cultivation and harvesting :

- 157 varieties and species of grasses and foreign plants.
- 94 foreign vegetables and field seeds.
- 9 varieties of foreign millets.
- 5 foreign fruit trees.
- 8 native and foreign nut trees.

30 varieties of foreign cottons—15 of these were planted the season before and the second crop of cotton was gathered in 1895—15 were cultivated for the first time. The cultivation of this foreign cotton has been conducted for the purpose of securing acclimated seeds.

93 varieties of native cotton seeds, the results of five years experiments in crossing.

52 varieties of cotton seeds secured by crossing the native forms with the foreign cotton of second year cultivation.

11 ornamental plants, most of which are foreign, consisting of shrubs and trees.

From the data secured from the above planting in the Botanical Garden four bulletins have been partially written and will be submitted for publication within the next month or two. One on the cotton experiments; one on certain valuable foreign plants suitable for introduction; one on foreign millets; one on grass cultivation.

Early in the year a quantity of seeds were distributed among the farmers of the State. These seeds were carefully selected from those found valuable last season; among the number were:

Ragi millet (*eleusine corocana*).

Kodo millet (*paspalum scrobiculatum*).

New Japanese buckwheat.

Some of the best forms of the cotton secured by crossing.

The following extracts are taken from some of the letters sent to the department from those farmers who gave the planting and cultivation of the seeds careful consideration. These extracts indicate that the results secured here at the Experiment Station in the crossing of the cotton have pointed to the permanent establishment of some of the valuable features of the cotton viz:

maturity of the fibre, length of fibre and increased yield of the lint.

“The cotton you sent me last spring was planted and cultivated after the usual order. One variety” (Petit Gulf X W. A. Cook) “if I mistake not, is a superior cotton, in that it is earlier, stood dry weather better without shedding, in fact is a better cotton than any we have seen.” R. H. Cross. (Letohatchee).

“The land upon which the test was made was poor gray up-land, cleared about five years ago, and would produce about 500 pounds of seed cotton per acre. I planted the improved seed May 1st. 2 feet apart in the row. The cool weather of May 18th. reduced the stand to about  $\frac{3}{4}$  of a crop. June 21st the cotton was knee high and beginning to form squares. On July 10th the plants were three feet high; and the first bloom opened July 16th. I planted only  $\frac{1}{4}$  of an acre and fertilized at the rate of 500 pounds per acre. The yield was 279 lbs seed cotton from the  $\frac{1}{4}$  acre or 1116 lbs per acre or 372 lbs of lint cotton. I sold this cotton at  $7\frac{1}{2}$  cents per lb.” H. H. Pitts. (Rock Mills, Ala.)

Another farmer states that the cotton produced  $\frac{3}{8}$  more than any other cotton in his section although the season was very unfavorable for the crop. He also stated that the plants grew taller and developed more fruit limbs than any other varieties, and the plant was in every way much more healthy than the ordinary forms cultivated by the farmers in that part of the State.

“In regard to the results of experiments with the Ragi millet I have to say that I sowed the seed in drills three feet apart and 50 yards long, on the 18th of April. Land was red mulatto, top soil underlaid six inches below with firm tenacious clay. Fertilized last year with barnyard manure and cotton seed. No fertilizers used this year. I obtained a fair stand. Soon after plants appeared I

shaved either side with hoe and as soon as practicable thereafter plowed with 18 inch sweep. In two weeks later I again plowed with 22 inch sweep which was all the cultivation I gave it. It grew from three to five feet high. I did not feed any until after the seed matured, when I cut off the heads and fed the stalks to my colts, both in green and in cured state. They ate it up clean and seemed to relish it very much. Some of the stems were as large as a man's finger—yet the colts ate every part of it." John W. Young. (Luther's Store).

The following tabular statement shows the results secured at the Experiment Station in Auburn, with the same kind of cotton seeds distributed among the farmers of the State. The land is poor and consists of a sandy loam containing very little clay, yielding with the ordinary cotton about  $\frac{1}{2}$  bale to the acre. The fertilizers were applied at the rate of 200 lbs per acre. The crop was chopped to a stand of 2 feet in the row with rows three feet apart. The amount of land in cultivation was slightly above  $\frac{2}{3}$  of an acre. There were 2828 stalks on this land, or at the rate of 4242 stalks of cotton to the acre. The season was not very favorable for cotton growth, otherwise the results might have been much more satisfactory. The plants were uniformly healthy and free from the attacks of disease, while on the ordinary cotton in other portions of the farm rust was very bad and destructive. The leaves on the improved cotton were of a deep green color and the limbs were well fruited :

	Seed Cotton Total.	Number Stalks.	Seed Cotton Per Stalk.	Seed Cotton Per Acre.	Lint Per Acre.
2 Allen X Peerless	47	124	0.38	1656	552.
3 Allen X Peerless	29	85	0.34	1782	594
7 Bailey X Cook	34	127	0.27	1908	636
11 Barnett X Cook	86	159	0.60	2163	721.
12 Barnett X Peerless	9	5	1.60		
14 Cherry X Cook	71	130	0.55	2292	764
19 J. C. Cook X Peerless	83	128	0.65	2544	848
33 Hawkins X Peerless	20	73	0.27	891	297
37 Jones imp'd X Peerless	20	94	0.22	1017	339
38 Jones L staple X Peerless	24	88	0.27	1272	424
43 King X Cook	56	135	0.42	1782	594
46 Okra leaf X Peerless	69	112	0.60	2799	933
47 Peeler X Peerless	11	67	0.16	1017	339
49 Peeler X Peerless	20	63	0.32	1656	552
50 Peeler X Cook	20	52	0.38	2037	679.
51 Peerless X Cook	17	69	0.24	1782	594
54 Peterkin X Peerless	57	154	0.37	1401	467
55 Petit Gulf X Cook	97	177	0.55	3309	1103.
58 Rust Proof X Peerless	73	101	0.70	2544	848
70 Truitt X Peerless	48	130	0.39	1656	552
71 Truitt X Cook	61	113	0.53	2292	764
74 Welborn X Peerless	30	123	0.24	510	170
76 Wonderful X Peerless	62	114	0.54	2544	848
83 Zellner X Cook	15	140	0.32	1272	424

Ans. 614

A more elaborate discussion of the results will be found in the bulletin soon to be issued, and already referred to in another part of this report.

Considerable progress has been made in compiling and writing the Botany of Alabama begun some time since. This work will be issued in parts and in such shape so that when completed the whole may be bound readily into a volume which will give the families in botanical sequence. Part I will be ready for the printer sometime within the coming month.

Other parts will follow as rapidly as the material can be prepared. It was my pleasure to begin the preparation of this Botany of Alabama prior to 1887 but the destruction of the Museum by fire that year lost the Institution a valuable herbarium rich in plants collected from

Alabama by Prof. Darby, Prof. Thornton, Prof. Stubbs and myself.

The Station Library has steadily grown since my last report and we now have on the shelves the most important periodicals relating to science published in this country and abroad. A large number of these journals have been bound during the year amounting to 165 volumes. Besides these periodicals there has been also bound 85 volumes of the bulletins and annual reports received from the various State Experiment Stations in the United States.

Respectfully,

P. H. MELL,

Botanist.

# REPORT OF CHEMIST.

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*Dr. Wm. LeRoy Brown, President :*

SIR:—I beg leave to submit the following statement with regard to the operations of the chemical department for the year just closed.

From the date of filing the last annual report up to this time, 480 quantitative analyses have been performed in this laboratory, in addition to a large number of qualitative examinations of waters, marls, mucks, clays and other materials of interest or value from an economic standpoint.

Fertilizers have constituted, as usual, the chief bulk of our quantitative work, but there have also been included analyses of feed stuffs, soils, marls and natural phosphatic deposits occurring within the State.

Analyses of foreign forage plants, tested experimentally in the botanical plats of the station, have also been made with a view to determining their nutritive values as compared with our ordinary domestic feeding stuffs.

A number of analyses of different varieties of sugar beets were also made during the latter part of the past summer, though the results of the chemical tests were not at all encouraging.

Although quite a high sugar content in one or two varieties was secured early in the season, a rapid deterioration set in soon thereafter, and the beets failed of maturity on account of the presence of nematodes in such great abundance.

In co-operation with the "Division of Nutrition Investigations of the U. S. Department of Agriculture," this

department, during the past summer, conducted a series of investigations as to the character and quality of the principal food materials consumed in the State of Alabama, at the same time supplementing by analytical work performed in this laboratory, some dietary experiments conducted by Prof. Washington of the Tuskegee Institute.

The foods and food materials included all of the principal meats in use, embracing both domestic meats, and those imported from western markets, the principal cereal products, and most of the articles of country produce commonly found upon our markets.

The experiments in the employment of improved methods in the manufacture of syrup from sugar cane, commenced in the fall of 1894, have been continued during the past season, and it has been demonstrated that a change in the present crude methods employed in syrup making and in the preservation of syrups, will not only materially improve the quality of the product, but will enable it to be kept on the markets for a much longer period than heretofore,

Two bulletins have been issued by this department since the publication of the last annual report, viz: a bulletin entitled "Fertilizers Commercial and Domestic," which was published in February, 1895, and a bulletin on "Cane Syrup," which was issued in October.

In addition to these publications, the annual Fertilizer bulletin for the State Department of Agriculture was prepared and published in July of the past year.

The investigation of the composition and nutritive value of foods and food materials, in co-operation with the U. S. Department of Agriculture, is being continued, and a series of experiments is just being commenced with a view to securing some means for the preservation of the sweet potato for use as a food material



throughout a longer period of the year than heretofore.

Respectfully submitted,

B. B. Ross,  
Chemist of Experiment Station.

## REPORT OF VETERINARIAN.

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*Dr. Wm. Leroy Brown, Pres.:*

DEAR SIR:—The following is a brief statement of the work done during the year 1895:

In November this department issued a bulletin on Bovine Tuberculosis. The subject was considered in its relation to public health in the human family and in its relation to the cattle industry of the State. The history of tuberculosis, the relative number of deaths from it, its prevalence among the white and black races and among domestic animals, its cause, its symptoms in cattle, its methods of transmission, and how to recognize tuberculosis in cattle were discussed.

Suggestions were made relating to the duty of the State, the cities, the dairymen and the individual in order that tuberculosis may be eradicated both in man and domestic animals. The chief object of the bulletin was to awaken public interest and thus secure aid in determining a definite idea of the extent of tuberculosis among the cattle of the State.

In our pathological and bacteriological laboratory, a study of the surface or skin tumors, that are so common on mules and horses in Alabama, has been started. Practical and simple methods of treatment of these tumors have been tested; in this we have been quite successful. A full report on these subjects will be made as soon as the work has been completed.

Two series of pig feeding experiments were conducted during the year. The results of these two series and the one of the previous year will be published early in 1896.

It has been the aim of the Veterinarian to lecture in various parts of the State as often as his duties would permit; but owing to a large increase of work at the college and station the number of farmers' lectures were less this year than in previous years.

The work of examination of cases and testing new remedies and lines of treatment has been greatly extended. During 1895, we examined and treated 581 cases.

Special effort has been made to collect plant and animal parasites that live upon or in domestic animals. Also, a number of interesting and valuable pathological and anatomical specimens have been added to our museum. Our laboratory has been improved as much as the limited means at our disposal would permit.

Respectfully submitted.

C. A. CARY.

# REPORT OF BIOLOGIST.

---

DR. WM. LEROY BROUN, *President.*

SIR:—I have the honor to submit the following report of the work of the department of Biology during my term of office thus far :

I received notice of my appointment to the position of Biologist of the Experiment Station late in September, 1895, and reached Auburn October 1st. My arrival therefore was after the growing season was largely passed and comparatively little opportunity existed for studying the diseases of growing plants. Only by inference can I give any report for the portion of the year prior to my arrival since no records other than those already published have been placed in my hands. I have however made a short series of observations on (1.) The diseases of cotton, (2.) On the prevalence of nematode root-galls on various cultivated and naturalized plants with a view of ascertaining what plants are not affected. (3.) On the diseases that are at work on the grape vines on the station farm.

Considerable time has also been given to the collection and identification of the parasitic fungi found on the native and cultivated plants of the vicinity of Auburn and considerable additions have been made to the collection belonging to the department. It is my purpose to extend this work largely during the coming year and include a systematic and economic study of the fungous flora of Alabama, since comparatively little is known of the extent and character of the rich cryptogamic flora of Alabama, or for that matter of any portion of the states bordering on the Gulf of Mexico. The collection of such

data and material will contribute directly towards a complete biological survey of the State of Alabama which ought to be included in the plans of the department for the immediate future. While such a survey will necessitate the co-operation of all the available scientific workers in the state and require the work of years to place it on its proper footing, it is desirable that such work as can be commenced now be brought to bear on the ultimate purpose of such a survey and be in line with the work such a survey ought to accomplish. Besides the general scientific bearing of such work, there are a number of lines of economic importance to be determined by a better knowledge of the local cryptogamic flora.

Investigations are being pursued in the direction of collecting data regarding the extent and distribution of cotton diseases and the best method of treating them, and also on the diseases of fruit which seem to be serious in various portions of the state. Since no bulletin has been issued from the station giving detailed methods of treatment of fungous diseases of plants, other than cotton, a bulletin for general information has been prepared jointly by this department and the department of Horticulture giving (1) A general statement of the nature of fungous diseases and (2.) The best methods known for the specific treatment of the diseases known to be most prevalent in the state affecting the leading agricultural and horticultural products. This bulletin is ready for publication and is intended to serve as a general guide for farmers and fruit and truck growers to the intelligent use of fungicides.

One lecture has been given on the fungous diseases of fruit, at Citronelle, Mobile County.

Respectfully submitted,

L. M. UNDERWOOD,  
Biologist.

AUBURN, January, 1896.

# REPORT OF AGRICULTURIST.

---

DR. WM. LEROY BROWN, *President.*

SIR:—The following statement of the work done by the Agricultural Department of the Experiment Station in 1895 is compiled from the record books which were put in my possession Jan. 1, 1896. The work was all conducted by Prof. A. J. Bondurant, who discharged the duties of agriculturist till the date named above.

Twenty-seven varieties of tobacco, 20 of cotton, 19 of corn, and 11 of cowpeas were tested. The other experiments with field crops were a test of intercultural applications of fertilizers to cotton and a comparison of a compost with a mixed commercial fertilizer on cotton.

Under the supervision of this Department 27 lots of fertilizers were sent to farmers in as many portions of the State to test the effect of heavy applications of commercial fertilizers on corn. This Department also exercised some supervision over tests of seeds furnished by the U. S. Department of Agriculture.

Determinations of the amount and quality of milk produced by the individual cows of the Station herd were made.

The following bulletins were issued by this Department during 1895 :

No. 59. Co-operative Soil Tests of Corn.

No. 64. Tobacco.

No. 65. Co-operative Seed Tests.

Respectfully submitted,

J. F. DUGGAR,

Acting Agriculturist.

AUBURN, ALA., Jan. 21st, '96.

# REPORT OF HORTICULTURIST.

---

SIR: Having only taken charge of this department January 1, 1896, none of the work for 1895 was under my supervision. The records show that vacancies in the old vineyard and plum orchard were filled. Ten or twelve varieties of Japan Persimmons were planted.

In the nursery the following were planted: 1000 peach seedlings that were budded during the summer, 4160 grape cuttings which for some reason made a very poor stand, 116 fig cuttings of 20 varieties from the Dept. of Agriculture, 1067 apple root grafts.

In the vegetable garden a large number of kinds were grown but no results suitable for publication were noted except in a variety test with Irish potatoes. These are being prepared for publication with a Bulletin from the Agricultural Department.

Respectfully,

F. S. EARLE,  
Acting Horticulturist.





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OF THE  
ALABAMA AGRICULTURAL EXPERIMENT STATION  
FOR THE YEAR 1895.

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