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SIXTEENTH ANNUAL REPORT

OF THE

# Agricultural Experiment Station

OF THE

Alabama Polytechnic Institute.

AUBURN, ALABAMA



SIXTEENTH ANNUAL REPORT

OF THE

# Agricultural Experiment Station

OF THE

ALABAMA POLYTECHNIC INSTITUTE

AUBURN, ALABAMA

JANUARY 25, 1904.

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ALABAMA POLYTECHNIC INSTITUTE.

Auburn, Ala., Jan. 25th, 1904.

GOVERNOR WILLIAM D. JELKS,

*Executive Department,*

*Montgomery, Ala.—*

SIR:—I have the honor herewith, to transmit to you the Sixteenth Annual Report of the Agricultural Experiment Station of this College.

The report of the Treasurer, herewith included, is for the fiscal year ending June 30th, 1903.

This report is made in accordance with the provisions of the act of Congress (approved March 2nd, 1887), establishing Agricultural Experiment Stations in the several States and Territories.

It contains the report of the Director, the Chemist, the Veterinarian, the Agriculturist, the Biologist, and the Horticulturist, for the year ending December 31st, 1903.

Respectfully,

CHAS C. THACH,

President.

## TRUSTEES.

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*His Excellency*, WM. D. JELKS, President.....*Ex-Officio*  
I. W. HILL, Superintendent of Education.....*Ex-Officio*.  
R. F. LIGON, JR.....Montgomery, Ala.  
TANCRED BETTS.....Huntsville, Ala.  
WM. C. DAVIS.....Jasper, Ala.  
JONATHAN HARALSON.....Selma, Ala.  
N. D. DENSON.....LaFayette, Ala.  
J. A. BILBRO.....Gadsden, Ala.  
J. M. CARMICHAEL.....Ozark, Ala.  
W. K. TERRY.....Birmingham, Ala.  
T. H. FRAZER.....Mobile, Ala.  
T. D. SAMFORD.....Opelika, Ala.

## AGRICULTURAL EXPERIMENT STATION.

### STATION COUNCIL.

CHAS. C. THACH, M. A. ....President.  
J. F. DUGGAR, M. S. ....Director and Agriculturist.  
B. B. ROSS, M. S. ....Chemist.  
C. A. CARY, D. V. M., B. S. ....  
.....Veterinarian, and Director Farmers' Institutes.  
E. M. WILCOX, PH. D. ....Plant Physiologist and Pathologist.  
J. T. ANDERSON. .Chemist in Charge of Soil and Crop Investigation.  
R. S. MACKINTOSH, B. AGR. ....Horticulturist.

### ASSISTANTS.

C. L. HARE, M. S. ....Assistant Chemist.  
A. M. RANSOM, M. S. ....Assistant Chemist.  
THOS. BRAGG, M. S. ....Assistant Chemist.  
C. M. FLOYD. ....Superintendent of Farm.  
JESSE M. JONES, B. S. ....Assistant in Animal Industry.  
H. O. SARGENT, M. S. ....Assistant in Horticulture.

## REPORT OF TREASURER.

Treasurer of Alabama Polytechnic Institute, in account with  
United States Appropriation Hatch Fund, for the year 1902-1903.

*Receipts—*

To United States Treasury ..... \$15,000 00

*Disbursements—*

## By amount paid:

Salaries .....	\$8,828 91	
Labor .....	1,367 62	
Publications .....	799 69	
Freight and express .....	266 12	
Heat, light, and water .....	308 29	
Chemical supplies .....	408 78	
Seeds, plants, and supplies .....	687 81	
Fertilizers .....	342 07	
Feeding stuff .....	317 57	
Library .....	500 45	
Tools, implements, and machinery ..	72 89	
Scientific apparatus .....	398 38	
Live stock .....	17 25	
Furniture and fixtures .....	118 37	
Contingent .....	15 00	
Postage .....	147 58	
Building and repairs .....	403 22	
		\$15,000 00

STATE OF ALABAMA, }  
Lee County. }

Personally appeared before me, Welborn Jones, a Notary Public  
in and for said county, E. T. Glenn, known to me as Treasurer of  
the A. P. Institute of Alabama, who being duly sworn, deposes and  
says that the above and foregoing account is true and correct.

Witness my hand, this 25th day of January, 1904.

[SEAL.]

WELBORN JONES, N. P.

This is to certify that I have compared the account with the led-  
ger account of the Treasurer, and this is a correct transcript of the  
same.

CHAS. C. THACH,  
President A. P. Institute.



REPORT OF THE DIRECTOR AND AGRICULTURIST.

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J. F. DUGGAR.

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C. C. THACH,

*President Alabama Polytechnic Institute.*

Sir:—I have the honor to submit the following report of the work under my charge in 1903 in the Agricultural Experiment Station.

REPORT OF THE DIRECTOR.

At the last meeting of the Board of Trustees I was made Director of the Experiment Station, the duties of this position beginning July 1st, 1903. The other changes in the Station staff since that time have been as follows:

The addition to the staff of an Assistant Horticulturist, H. O. Sargent, a graduate of the Alabama Polytechnic Institute; and the election by the Executive Committee of the Board of C. M. Floyd, as Superintendent of the Farm, vice T. U. Culver, who resigned December 15, 1903, to attend to his own farming interests.

The work of the Station in the several departments has been along the lines heretofore pursued. During the year the bulletins published were as follows:

*Annual Report for 1902.*—This publication contains the usual brief reports of the work of the different departments.

*Bulletin No. 122.—Grazing and Feeding Experiments With Pigs.*—This bulletin by the Agriculturist records the results of a number of feeding experiments with peanuts, chufas, cowpeas, Dwarf Essex Rape, sorghum, varying percentages of cotton and meal, and rice polish, alone and in various combinations.

*Bulletin No. 123. Vetch, Cowpeas, and Soy Beans; Hay as Substitute for Wheat Bran.*—In this bulletin from the Agricultural Department are given the results of feeding experiments with milch cows. The results showed that these home-raised hays were advantageously used as substitutes for wheat bran, a material for which the Southern dairyman makes large expenditures, and the purchase of which may be in a large degree avoided by growing large amounts of these forage plants.

*Bulletin No. 124. The Horticultural Law, Notes on Some of the Insects and Fungous Diseases Affecting Horticultural Crops.*—This bulletin by the Horticulturist contains the Alabama law approved March 5, 1903, the object of which is to prevent the introduction and spread of crop pests, especially those that threaten the fruit interests of the State. This publication also contains the rules adopted by the State Board of Horticulture, created by this act, and consisting of the Commissioner of Agriculture, the President of the Alabama State Horticultural Society, and the Director of the Alabama Experiment Station.

In this bulletin are articles describing and giving remedies or preventive treatment for the San Jose scale, the new peach scale, black knot, crown gall, peach yellows, peach and plum rosette, and the wooly aphid.

*Bulletin No. 125. Some Diseases of Cattle.*—In this publication the Veterinarian and his assistant discuss the cause and treatment of cowpox, varicella, furuncu-

losis, obstructions to the flow of milk from the teat; poisonous plants, dysentery in young animals, acute indigestion, abortion, milk fever, and inflammation of the udder.

*Bulletin No. 126. A Leaf-Curl Disease of Oaks.*—In this bulletin the Plant Pathologist discusses the life history and remedial treatment of a scale insect which has done much damage to forest trees in this State.

These publications contain 222 pages. The usual number of copies of each bulletin distributed is 11,000. The mailing list is rapidly increasing. The calls for bulletins on a great variety of subjects and the continual increase in correspondence are gratifying evidences of the recognition of the usefulness of the Station. It is especially noteworthy that a large number of inquiries come to the Director's office from farmers in the North who desire to settle in the South.

There has been the usual increase in the number of volumes in the Station Library. The permanent improvements and increase in equipment are noted in the reports of the heads of departments concerned.

Especial attention is called to the advantages to the livestock and Horticultural interests of the State resulting from the work of the Veterinarian in immunizing large numbers of thoroughbred cattle of beef breeds and of the Horticulturist in inspecting nurseries and orchards.

#### REPORT OF THE AGRICULTURIST.

The necessity of repeating field experiments makes the general plan of field work much the same from year to year. I have continually endeavored in the feeding-experiments conducted during each of the past eight years to encourage the production of such foods as may be economically grown on Southern farms instead of relying too largely upon purchased foodstuffs.

Heretofore, our limitations have made it possible to use only hogs, dairy cows, and a few young beef animals in such experiments. A notable departure has been made during the past year in beginning a series of feeding experiments with grade short-horn steers on a much more extensive scale than has been possible in the past. The foods that are now being compared as economical producers of beef are the following:

- (1.) Sorghum hay in comparison with a mixture of cowpea and sorghum hay;
- (2.) Sorghum hay and mixed hay (as above) in comparison with shredded corn stover;
- (3.) Cotton seed meal as compared with cotton seed.

Up to the time of the publication of this report the steers on all of the rations are making satisfactory gains in weight. Sheds were erected especially for feeding experiments with steers.

The occurrence of a disease that has had no fatalities has made it necessary to postpone the usual feeding experiments with dairy cows.

The purchase of a herd of Herefords and additions to the Station herds of Angus and Shorthorn cattle has increased the interest of the public in animal industry.

The field work of the past year has been extensive and varied. A few of the more important lines of work are as follows:

Cotton—Continuation of the study of varieties (108 in 1903) with a view to correct descriptions and classification; culture and fertilizer experiments at Auburn; and co-operative fertilizer experiments conducted in a number of localities in Alabama.

Corn, oats wheat—Culture, variety and fertilizer experiments.

Cowpeas, Soy Beans, Alfalfa, Sorghum—Variety and fertilizer tests.

Other Forage Plants—Variety and Fertilizer tests.

Soil improvement has been made a prominent feature of the work, as heretofore. The study of the immediate and residual effects of manure from cattle has been continued through the past four years. Rotation experiments begun eight years ago are still in progress and each year's results have increased value.

The practical value of inoculation of the seed of crimson clover, alfalfa, and vetch has again been most strikingly demonstrated on the Station farm in 1903. In order to make local demonstrations in each county in the State of the usefulness of this simple process and of the value of alfalfa, vetch and crimson clover, co-operation with the United States Department of Agriculture was entered into. By this means provision was made for 85 experiments with alfalfa, 45 with hairy vetch, and 45 with crimson clover, a total of 175 experiments on about 175 acres of land. Although the continued dry weather of last fall and the early and severe frèezes of this winter have doubtless ruined many of these experiments; yet it is expected that the effort to introduce these plants in nearly every county in the State will give a great impetus to the culture of these most valuable forage and soil-improving plants and to the upbuilding of the livestock industry on this foundation.

Respectfully submitted,

J. F. DUGGAR,  
Director and Agriculturist.

## REPORT OF THE CHEMIST.

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B. B. ROSS.

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C. C. THACH,

*President Alabama Polytechnic Institute.*

Sir:—I beg to submit the following statement with reference to the character and scope of the work of the Chemical Department of the Experiment Station for the year just ended.

During the six months following the presentation of the last annual report, the time and attention of the analytical staff of this laboratory were almost entirely occupied with the work of analysis of official samples of fertilizers, the actual amount of analytical work thus performed being in excess of any previous year's record. The results of these analyses have been published, as heretofore, in the annual fertilizer bulletin issued by the State Department of Agriculture and the fertilizer work of the season of 1903-04 is being taken up at this writing.

Since the beginning of the present season this office has answered many inquiries from farmers and consumers with regard to the preparation of home-mixed fertilizers adapted to the requirements of various crops and soils and much information has been supplied by correspondence with reference to formulas for home mixtures to supplant to some extent, at least, the complete mixed fertilizers so generally employed in the fertilization of cotton. The increased interest manifested by consumers in the question of the employment and appli-

cation of home mixed formulas is a gratifying evidence of a growing determination to better consult the requirements of the plant or soil in the selection of fertilizers or fertilizing materials for use in the cultivation of the leading crops.

In addition to the fertilizer work above alluded to many samples of phosphate rock, marls, soils, waters, ores, forage plants, feed stuffs, insecticides, etc., have been analyzed during the past year, especial attention having been given during the past summer to the analysis of a considerable number of samples of Paris Green, forwarded by parties employing this insecticide as a poison for the cotton worm whose ravages were somewhat extensive in certain sections of the State during the months of August and September.

Owing to the liability of adulteration of this insect poison and to the possibility of the sale of low grade or spurious lots of it for use in this State, a bill regulating the sale and providing for the inspection of Paris Green offered for consumption in the State was prepared in this office and was introduced in both Houses of the Legislature at the September session.

It received a favorable report from the Agricultural committees in both the House and Senate, but failed of final passage by reason of the inability of the friends of the measure to secure its consideration owing to the crowded condition of the calendars during the latter part of the session.

At its last meeting, a special appropriation was made by the Board of Trustees for the purpose of carrying out experiments in improved methods of syrup making, the work involved to be conducted under the supervision of this department. A portion of this fund has been employed in experimental work in South Alabama, a series of experiments and analytical tests having been carried

to a successful conclusion upon the farms of two of the largest syrup producers in the State.

Both of these parties offered all possible facilities in the execution of these experiments and tests, and it is worthy of note that they have both recently purchased and installed costly and modern apparatus and appliances for the manufacture of syrup upon a large scale. It is the intention of this department to issue at an early date a bulletin upon this subject, in which will be embodied the results of some of these experiments and of observations with reference thereto.

This department is now conducting a series of laboratory experiments in connection with the subject of "fillers" or "make weights" employed by manufacturers in the preparation of complete mixed fertilizers, as well as of acid phosphates, these materials being used chiefly in low grade fertilizers which are placed on the market largely in response to the demand of the consumer for cheaper and less concentrated commercial manures. It is possible that some of the materials employed as fillers bring about objectionable changes in the composition of some of the constituents of the mixtures of which they are the ingredients and it is the purpose of this investigation to study the nature and extent of the changes thus produced, with a view to incorporating the results in a future bulletin.

In August of the past year Mr. J. C. Phelps resigned his position upon the analytical staff of this laboratory and Mr. A. McB. Ransom, who filled the position of Assistant Chemist in the College and Station Laboratory during the absence on leave of Assistant Prof. Hare has been retained as an Assistant Chemist in this department.

Very respectfully,

B. B. Ross.



REPORT OF THE CHEMIST IN CHARGE OF THE SOILS AND  
CROP INVESTIGATIONS FOR THE YEAR 1903.

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J. T. ANDERSON.

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C. C. THACH,

*President Alabama Polytechnic Institute.*

Sir:—During the year 1903, the writer with the co-operation of the Department of Agriculture was occupied in part with investigations whose purpose was to ascertain to what extent legumes are dependent on the soil for their nitrogen. A pressure of duties in other lines of work caused some delay in executing the analyses of soils, waters, and crops in these investigations during the season of 1902, and much of this delayed work was done during the year 1903. Circumstances beyond our control prevented the continuance of these pot experiments during the season of 1903, as was intended, the results hitherto reached seeming to make a continuance advisable. So it is proposed to take up the investigations again during the coming season.

During the latter part of the year embraced in this report some analyses of cotton stalks grown on especially fertilized plots were made to ascertain the effect of potash fertilization on the potash content of the plant. This is preliminary to a fuller investigation with the co-operation of your Department whose purpose is to ascertain whether the potash content of the plant may not be used to determine the potash requirements of soils. This investigation is similar in design and in the method of procedure to that pursued by the writer in the work whose results were set forth in bulletin 57.

As during previous years, the writer was required to

give the bulk of his time to the analysis of commercial fertilizers. During the year this work exceeded in volume that of any previous year.

During the yast summer the State Chemist was absent on leave, and during his absence the writer performed the duties of that office.

A few miscellaneous analyses for other Departments of the Station were also made during the year.

Respectfully submitted,

JAS. T. ANDERSON, *Chemist.*

(Soils and Crop Investigations.)

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## REPORT OF PLANT PHYSIOLOGIST.

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E. M. WILCOX.

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C. C. THACH,

*President Alabama Polytechnic Institute.*

My Dear Sir:—I have the honor to submit herewith a report covering the operations of the Department under my charge during the year 1903.

The Department has largely added to its permanent equipment during the year, and is now in better condition for the prosecution of original investigations than ever before. Among these improvements may be mentioned the extensive alterations in the greenhouse and laboratory connected therewith that have been fitted up for work in physiology and pathology. This laboratory greenhouse as now fitted up will be of great service to me in conducting during the winter experiments along the lines mentioned above. In addition a considerable number of pieces of apparatus have been added to the

equipment for Station investigations along botanical lines.

Bulletin 126 recently published, contains the results of studies made on "A Leaf-Curl Disease of Oaks." It is proposed to make this spring a more extensive test of Bordeaux mixture in combatting this very troublesome disease.

During the past summer, in co-operation with the Seventh District Agricultural School, at Albertville, Alabama, I planted out two acres to a total of 259 varieties of Castor Oil Beans for the purpose of determining the best sort to be grown to give the largest oil yield. The results of this and previous years' work upon this subject are now being put in shape for early publication as a Bulletin. A number of parties have manifested interest in this work and larger plantations of a few of the best varieties may be made during the coming summer in some part of the State.

Considerable attention has been devoted to a study of a blight of pecans which was called to my attention in this State. As yet our results are not in shape for publication, but the work will be continued during the coming summer. Much progress has been made in the study of the diseases of our leguminous forage plants and it is hoped to continue some features of the work under field conditions this coming summer.

A Bulletin containing a descriptive account with illustrations of the most important diseases of cultivated plants within the State has been practically completed but cannot be published without further data be secured regarding the distribution of the diseases in the State. In order to secure this information it will be necessary to provide funds for traveling expenses. Unless such provision is made this Department cannot make rapid progress in the study of diseases that are known to occur in the State.

The herbarium has grown the usual amount during the year; we now have no proper storage cases for the herbarium and of course it would be folly to add rapidly to our collection under these circumstances. In fact the present cases are utterly unfit for the purposes of protecting the collections from insect injury and it requires much to prevent the rapid destruction of the plants we now have on hand. I hope that means may be provided during the coming year to assist me in caring for and further extending our collections; it must be remembered that these collections constitute the most valuable part of our equipment.

I have been able to accumulate some data regarding the forest products and resources of the State but have been able to visit but few localities for this purpose. This is an important subject and I shall give it all the attention possible in the future.

Respectfully submitted,

E. MEAD WILCOX,

*Botanist and Plant Physiologist and Pathologist.*

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#### REPORT OF VETERINARIAN.

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C. A. CARY.

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C. C. THACH,

*President Alabama Polytechnic Institute.*

Dear Sir:—The following is a synopsis of the work of the Veterinary Department for the year 1903:

Bulletin No. 125 was issued in June. It treats of some of the more common diseases of cattle. The following table of contents will give some idea of its scope:

Cow Pox—Variola.  
 Varicella  
 Furunculosis.

Obstructions to Milk Flow.

Papillomas (warts).

Poisonous Plants.

- (a) *Kalmia Latifolia* (Laurel Ivy).
- (b) *Aesculus Pavia* (Red Buckeye).
- (c) *Prunus Carolinensis* (Mock Orange).
- (d) *Prunus Serotina* (Wild Cherry).
- (e) *Prunus Virginiana* (Choke Cherry).
- (f) *Prunus Persica* (Peach).
- (g) *Sorghum Vulgare* (Sorghum).
- (h) *Phytolacca decandra* (Poke Root).

Dysentery in Young Animals.

Acute Indigestion in Cattle.

Abortion.

Non-Infectious Abortion.

Infectious Abortion.

Parturient Paresis (Milk Fever).

Mammitis—Mastitis—Garget.

The pig-feeding tests with cotton seed meal have been continued or repeated. Some new tests are also being made. A few facts have been fairly well established, namely: (1) The younger the pig more susceptible it is to the poisonous effects of cotton seed or cotton seed meal; (2) As a rule, a mixed ration will not kill hogs or pigs under five or six weeks; (3) Cotton seed meal appears to be more virulent or more certainly and rapidly fatal than cotton seed; (4) Full blood or pure bred or cross bred pigs not allowed to run loose in fields are more susceptible than grades or scrubs; (5) Cotton seed meal in mixed ration appears to be digested and assimilated better than whole cotton seed; (6) Unless a cotton seed or a cotton seed meal ration should produce relative or absolute sterility in sows, it is possible that pigs may be made immune by breeding or by heredity.

Protective blood inoculations to prevent virulent attacks of tick fever, or to immunize breeding cattle to tick fever, have been more numerous than in any previous year. In fact, much of my time during the winter months has been taken up in this work. This work is done for any breeder or vender of pure-bred cattle in Alabama at the nominal cost of my travelling expenses. This year we have inaugurated the plan of aiding Northern breed-

ers by inoculating and treating herds of pure-bred cattle at the Veterinary Department before the cattle are sold at private sale or public auction; it produces a safer and more certain immunity than that which is attempted by the novice without proper records, care and attention.

Immunizing breeding cattle at the department for the seller, permits or forces the vendor to pay all the expenses of immunization and stand all losses by death from inoculation fever. But all deaths from fever by tick inoculation should be borne by the purchaser unless he wishes to pay for what has proven to be a very high price for a guarantee from the seller that the animal will live through the first summer following the protective blood inoculation. The height and length of the fever reactions following blood inoculation seem to determine the degree of immunity; the higher the temperature and the longer the period of fever (providing the animal can stand it) the greater the degree of immunity. Hence, the temperature records of inoculated cattle must be taken at least two times per day, in order to secure any accurate idea of the degree of immunity. The best time for inoculating cattle is in late fall or early winter. The best ages for cattle are sucking calves from two to six months old or weaned calves from 8 to 15 months old. The best place for inoculating cattle is in the South as near as possible the place where they are to be used as breeding animals.

The investigation of "sore-head" in chickens has been continued and we hope to print in the near future some of the results obtained.

Tuberculin has been made in our laboratory and given to the city boards of health of Montgomery and Birmingham and to all veterinarians and doctors in Alabama who apply for it. We stipulate that all records of tuberculin tests made with our tuberculin be sent to the department. I have, also, assisted Montgomery and Birmingham in both meat and milk inspection whenever called upon for such aid.

I have visited various localities in Alabama to investigate diseases of live-stock when requested by the Commissioner of Agriculture and by live-stock owners.

The Farmers' Institutes for the year 1903 were not

quite as numerous, but the total and the average attendance were greater than in any previous year.

No. of Institutes held in 1903 .....	21
No. Counties in which Institutes were held.....	20
Total attendance .....	3,008
Average attendance at each meeting .....	143

One reason why the number of Institutes was slightly smaller than for the previous year was the fact that a "Short Summer School for Farmers" was held at the College and Station, during the first part of August, at a time when many Institutes could have been held. Yet it must be remembered that the Summer School for Farmers is an outgrowth of Farmers' Institute work and might be considered as a "State Round-up Farmers' Institute." The summer course for 1903 enrolled 130 farmers from Alabama and Georgia, and next year (1904) we expect to enroll 500 farmers from Alabama.

Respectfully submitted,

C. A. CARY,

*Veterinarian and Director of Farmers' Institutes.*

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## REPORT OF HORTICULTURIST.

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R. S. MACKINTOSH.

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C. C. THACH,

*President Alabama Polytechnic Institute.*

Sir:—It gives me pleasure to report that on taking charge of the Department of Horticulture, in January, 1903, I found the greenhouse and the orchards and gardens in reasonably good condition. The orchard plantings made by Professor Earle were made with care and with the idea of solving some of the many problems confronting the fruit growers of this State.

No new line of work was attempted the past year. The aim has been to continue the work as formerly planned,

and to lay a foundation for the future. Considerable time has been spent in rearranging the system of recording notes in order that future additions may be more easily recorded.

Repairs were made to the heating plant and a new ventilating apparatus was installed in the greenhouse. This work was done without employing outside help. The greenhouse is more economically heated than formerly, and it enables us to grow some of the more important plants.

A large part of my time has been taken up in inaugurating the execution of the law passed by the last Legislature, which made the Professor of Horticulture the State Horticulturist. It is my duty to examine and certify to the health of all nursery stock sold or grown in this State. This work is very important and will be worth many times its cost in protecting the fruit industry of our State. Up to date, fifty nurseries have been examined, and ninety-three outside nurseries have been granted certificates allowing them to sell trees in this State. It has taken more time to do this work this year on account of our not knowing the location of all the nurseries. San Jose scale was found in only four of these. The owners realize the importance of sending out clean stock, and I believe that they have complied with all the requirements made of them.

The following is a list of the certificates granted to nurserymen in this State:

1. Alabama Nursery Co., Huntsville.
2. J. O. Kelly & Sons, Jeff.
3. John Fraser, Huntsville.
4. Huntsville Wholesale Nurseries, Huntsville.
5. Oak Lawn Nursery, Huntsville.
6. Stark Bros. Nurseries and Orchards Co., Huntsville.
7. S. Palmer, Madison Station.
8. Trinity Nurseries, Trinity.
9. W. H. Doughty, Athens.
10. Gravlee Nursery Co., Newtonville.
11. Joppa Nursery Co., Joppa.



12. J. B. Williamson, Joppa.
13. Willie Smith, Albertville.
14. Fort Payne Nursery Co., Fort Payne.
15. P. C. Pendergrast, Fort Payne.
16. N. W. Chitwood, Chavies.
17. J. M. Stover, Bay Minette.
18. Jos. W. Thompson, Crichton.
19. Waverly Nurseries, Waverly.
20. J. J. Colmant, Birmingham.
21. C. A. Hughes, Getup.
22. W. G. Joiner, Ashland.
23. H. F. Joiner, Ashland.
24. W. L. Morris, Cussetta.
25. W. C. Joiner, Haywood.
26. Alexander City Nursery Co., Alexander City.
27. St. Clair Nursery Co., Steele.
28. Jamestown Nurseries, Jamestown.
29. W. B. Moseley & Sons, Jamestown.
30. Chisholm & Noble, Anniston.
31. F. E. Welch, Chunchula.
32. W. P. Roberts, Semmes.
33. James A. Wulff, Semmes.
34. Rosemont Gardens, Montgomery.
35. Joseph Pfingstl, Montgomery.
36. J. M. Crutchfield, Cullman.
37. W. F. Kent, Potash.
38. G. W. Lipp, Potash.
39. Frank Holman, York.
40. Alabama Rose Gardens, Newbern.
41. E. W. Hiley, Albertville.
42. R. N. Moody, Albertville.
43. DeKalb Nurseries, Fort Payne.
44. Brewer and Miles, Fort Payne.
45. Evergreen Nursery Co., Evergreen.
46. North Castleberry Strawberry Association, Castleberry.
47. B. F. Page, Canoe.
48. J. J. Holmes, Montgomery.
49. A. V. Callahan, Point Clear.
50. Escatawpa-River Nursery Co., Fruitdale.
51. M. B. Inman, Fruitdale.

The following dealers certificates have been issued:

1. Wm. E. Meade, Birmingham.
2. M. M. Dawson, Montgomery.
3. James A. Ligon, Spring Valley.
4. F. J. Ulbriecht, Anniston.
5. A. Swift, Fairhope.
6. J. J. Holmes, Montgomery.

The nurseries report the following stock growing on their grounds:

Peach .....	4,495,850
Apples .....	892,650
Plum .....	696,500
Pear .....	1,384,700
Cherry .....	1,140,700
Pecan .....	106,100
Grape .....	189,700
Miscellaneous, (Includes ornamentals, roses, etc.) .....	358,500
Total .....	<u>9,274,700</u>

The Horticultural Law and Notes on Some of the Insects and Fungous Diseases affecting Horticultural Crops has been printed as Bulletin No. 124. The demand for this has been very heavy and the edition of 12,000 is now exhausted.

A State Horticultural Society was organized soon after I took charge of the work. There is need of a strong society of this kind in the State in order that the various growers may meet to discuss the many problems that confront them.

I wish to thank the railroads of the State for their kindness in furnishing much of the transportation used in travelling about the State.

R. S. MACKINTOSH,

*Horticulturist.*



