1906

Eighteenth annual report of the agricultural experiment stations of the Louisiana State University and A. & M. College.

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EIGHTEENTH

ANNUAL REPORT

OF THE

Agricultural Experiment Stations

OF THE

Louisiana State University

AND

A. & M. College

FOR 1905.

TO THE GOVERNOR.

BATON ROUGE:
The Times, Official Journal of Louisiana.
1906.
To His Excellency, Newton C. Blanchard, Governor of Louisiana:

Sir—In accordance with the provisions of section 2 of the Act of Congress to establish Agricultural Experiment Stations in connection with colleges established in the several States under the provisions of an Act approved July 2, 1862, and the Acts supplementary thereto, I beg leave to submit a report of the operations of the Louisiana Agricultural Experiment Stations for the year ending February 1, 1906, including a statement of the receipts and disbursements from July 1, 1904, to July 1, 1905.

STATION No. 1.
SUGAR EXPERIMENT STATION, AUDUBON PARK, NEW ORLEANS.

Under the immediate direction of Mr. R. E. Blouin, this station has continued investigations along lines given in previous reports, and has taken up some new problems. The work conducted in the field, sugar house and laboratory have given much valuable information of technical and practical value. Comparing the records of weather conditions that have generally prevailed over the sugar section with those at the station, we find that our results have been obtained under average climatic conditions, but our tonnage of sugar cane was the heaviest secured for several years, with a fairly good sugar content.

This heavy crop, at a time when a large portion of the State experienced a disappointment in tonnage, is explained by the
fact that our soil was well prepared and the crop planted in the fall in excellent condition.

Planters who were forced to prolong the grinding season of the previous crop well into January began the cultivating season of 1905 under adverse conditions. The excessive rains made it impossible for them to complete the planting until late in the spring. The crop started growing with deficient cultivation, and spring was well advanced before the fields were put in good tilth. An unusually good stand of cane was secured over nearly the entire cane belt, and the greater portion of the summer gave favorable growing weather, but this was not sufficient to eliminate the effect of an adverse spring and insufficient cultivation, thus emphasizing the disadvantage to the man who can not do a large part of his planting at a favorable season in the fall.

The station plats for comparative tests of irrigated and non-irrigated cane, did not give any positive results. Only once was it deemed advisable to irrigate, and at this time a good rain fell soon after the work was completed. The irrigated and non-irrigated plats gave practically the same yield. The fact that the irrigation did no harm is of some importance. The fear that heavy rains, coming close after a period of artificial irrigation, might cause damage to the crop from excessive moisture has been a matter for serious consideration in discussing the practicability of irrigating the cane fields of Louisiana.

The investigations with sugar canes in the field embrace, besides the former experiments with home canes, varieties and seedlings; a study of the fertilizer requirements of D. 74, which has been found so well adapted to our conditions in Louisiana; also experiments with combinations of various sources of nitrogen in mixed fertilizers, to determine the early availability of nitrogen from these mixtures for the cane crop.

In the cultivation experiments two new combinations of cultivation with new implements were added. Experiments on planting cane at different periods have been started, and a careful study of the value of seed cane under different conditions is in progress. A study of the effects of the disc and the turn-plows in the preparation of the land, and the effects of the successive planting of cane on the same soil (or succession cane) have also been added as new experiments.
D. 74 and D. 95 seedling canes have maintained their high standard reported in previous years, and favorable results have been secured from the sugar plantations and at the station. The area of these seedlings is being very rapidly extended, and during the past season quite a number of tests were made in the sugar houses in the State, comparing these canes with our home varieties. In continuation of the policy adopted three years ago, of obtaining reports on the results of these seedlings on plantations, we received the past year, almost without exception, favorable reports from both field and sugar house.

This season the D. 74 has tasseled or arrowed in several places in this State, as well as in Florida, which State secured its supply of this cane from this station, thus showing that it maintains with us its early maturity, which is so pronounced in the tropics. Several tassels that have matured have been secured and planted by the station with the hope of producing seedlings originating in Louisiana.

NEW SEEDLING VARIETIES.

We have introduced from Demerara, Barbadoes, Trinidad and Jamaica fifty-four, new seedling varieties during the year, and quite a number of these show very promising characteristics. Additional new varieties are to be introduced this year.

In the sugar house comparative tests or runs were made with home canes D. 74 and D. 95, and the results, as on previous occasions, show markedly the superiority of the D. 74 over the other two varieties, followed by the D. 95 and the home canes in the order given. A study of sugar boiling has been continued, and the results will form a portion of a bulletin to be issued the present year.

Dr. C. A. Browne, Jr., and his assistants in the laboratories have completed investigations on the changes in composition of cane products in the progress of manufacture under different conditions of clarification, etc., and these results, together with a study of the chemical composition of the cane, are being prepared for publication in bulletin form. A study of the effects of different fertilizing ingredients on the composition of the cane and other investigations relative to the chemistry of sugar cane are now in progress.
CANE LOADERS.

The year 1905 marks the general adoption of machinery and horse power for loading cane from the row to the carts and wagons, ready to be conveyed to the mill. On two occasions the station invited manufacturers to send their cane loaders to give a public demonstration of the working efficiency of their machines. These tests were extensively advertised, and proved a strong drawing card. The following parties had cane loaders ready for trial on the appointed day: Bodley Wagon Company, Val. Goetz, Jr., J. C. Mire and P. A. & L. Trouard, with full-size implements, and J. D. Martinez and M. A. Picard, exhibiting models of their cane loaders.

These trials were a magnificent success. The first trial in which all the inventors mentioned took part was attended by more than 250 sugar planters and parties directly interested in the success of a cane loading device. Some of our best-informed planters stated that this was the largest number of representative cane sugar men ever assembled in Louisiana at any one time.

These gentlemen were from every sugar cane district, and, it may be added, from every sugar parish in the State, and were accorded a good opportunity to determine the relative merits of the different machines. The second trial was on July 20, in
which the Goetz and Trouard implements were practically tested and the Martinez and Picard models exhibited. This test was very successful and well attended, though the attendance was not as large as at the first test, there being about one hundred people present.

TESTING CANE LOADING MACHINES AT STATION NO. 1, SUGAR EXPERIMENT STATION, AUDUBON PARK, NEW ORLEANS, LA., 1905.

CANE HARVESTERS.

Several tests of cane harvesters were made at the station, but as yet this machine has not attained sufficient development to be put into practical use.

There were this year five working machines in the State and six prospective ones, for which patents have been secured. There is a marked improvement in the work of the various machines tested, and the outlook is very hopeful for a successful device to cut, strip, top and load the cane in the field. This, when accomplished, will relieve the labor situation at grinding time very greatly, and, it is hoped, will considerably diminish the cost of harvesting.

In considering this question, again we find some desirable features in the D. 74 cane. One of the chief difficulties in the way of perfecting a cane harvesting machine is to gather the fallen and crooked stalks. The D. 74 stands erect and withstands the storms far better than our Louisiana canes, and to this extent would be less difficult to harvest by machinery.
GENERAL AGRICULTURAL IMPLEMENTS.

The station has also tried quite a number of new agricultural implements proposed for work on our alluvial soils, and suggested changes which were possible and discussed the merits of the implements. Plows, cultivators, distributors of barnyard manure and filter-press cake and planters are the character of implements tested for the first time on alluvial soils at the sugar experiment station. We invite all manufacturers, agents and inventors of new implements to test them here, and while no publicity is given to these tests, any visitor to the station is always welcome to witness them.

SUGAR SCHOOL.

As has been the policy of the station for a number of years, the students of the Audubon Sugar School of the Louisiana State University and Agricultural and Mechanical College at Baton Rouge, La., were given a three months' course of practical work and instruction in agriculture, chemistry and sugar house work with sugar cane. The demands for graduates of this school exceed the supply so much that frequently students are induced to enter commercial work before finishing their regular course. The past season's requests for graduates and students were much heavier than usual, and only a small number could be supplied.

COTTON.

This crop, of which only a few trap plants were planted last year, was continued in the usual quantity this year, testing the varieties, and a very good yield was obtained, notwithstanding the unfavorable conditions that prevailed. The maximum yield of a little over two bales per acre was secured, this variety giving a yield of 3162 pounds of seed cotton. As reported last year, no boll weevils were found during the season, and the crop was planted on the same land that had cotton in 1903, when the boll weevil was placed in the station cotton by some miscreant, showing conclusively the extermination of the boll weevil here.

CORN.

Different varieties were tested, and home-grown and purchased seed of the same varieties compared; the home-grown seed giving the larger yield.
FORAGE CROPS.

Experiments have been continued with a large number of varieties of these crops, embracing alfalfa, red and crimson clovers, sorghums, teosinte, giant beggar-weed, cow peas, vetches, etc. Alfalfa yielded us five cuttings during the year from spring planting, yielding 3140 pounds of cured hay from the maximum cutting. With red and crimson clovers the results were very good. The other crops gave very good yields, but are not as profitable as either alfalfa or clovers.

The growth of the New Era cow pea attracted considerable attention from the sugar planters, and this year quite a number of them are planting this pea in their old stubble cane, which they expect to use for succession cane. This pea is a vigorous grower and comparatively a bunch pea, one that answers the desired qualities for planting in stubble cane, the vining varieties so popular for planting with corn causing much trouble in harvesting the cane.

FIBER CROPS.

The station continues its experiments with these crops, growing ramie and several varieties of jute and hemp. Inventors of decorticating machines frequently require us to furnish them with quantities of these crops for trial runs, and the quality of fiber secured from Louisiana-grown plants has been pronounced very fine. Japanese hemp, recently introduced here by the station, is a very prolific and vigorous grower, producing a superior fiber and giving large yields. All of these crops, however, await the perfection of a practical decorticating machine.

OLIVES.

All of our olivé trees were healthy and vigorous growers this year; they bloomed in 1904 for the first time, but failed to set fruit. This year 50 per cent of the trees were in bloom and one variety, the Pendulina, set fruit which came to maturity. They were successfully pickled and are of fine flavor and medium size. It is believed that these are the first olives grown to maturity and pickled in Louisiana.

CITROUS FRUITS.

The growing of citrous fruits has long been an established industry in the southern section of Louisiana, though several times freezes have almost exterminated the orchards. The
station being located in the northern portion of the citrous belt, our entire orchard was destroyed by the freeze of February, 1899. The orchard was replanted and a number of new varieties added to those previously grown, and these are now coming into bearing.

Hybrids, originated by Mr. H. J. Webber, of the Bureau of Plant Industry, United States Department of Agriculture, by artificially crossing the *Citrus trifoliata* with the edible oranges, and supplied to the station by Mr. Webber, have shown a larger number of bearing trees this year, and some of them are very promising in the quality of fruit, and we hope they will be resistant to our most severe freezes. They were not affected by a temperature of 18 degrees F. above zero, the coldest weather we have had since they were planted.

The *Citrus trifoliata* is very hardy, the coldest weather of North Louisiana having no harmful effect upon it. The fruit, however, is worthless. The idea of cross-breeding is to impart increased resistance to freeze to a plant that will produce a fruit that can be utilized.

During the past year we received from Mr. Webber stock for all of the stations from his new fruit, "citrange," which he believes will be hardy in a large portion of the State, and produce a desirable fruit, and also serve as a basis for further improvement. A number of trees have also been distributed in the State at the request of the director of the stations.

The following changes in the station staff were effected this year: In March Mr. W. F. Gobius resigned to accept a position as chemist at the Kahuka Sugar Company, in the Hawaiian Islands, and in January (this year) Mr. J. A. Verret, who was our chemist and sugar maker, handed in his resignation to accept a position as chemist of the Honolulu Sugar Company, also in the Hawaiian Islands. Both of these gentlemen left the station owing to inducements offered them to enter the practical manufacture of sugar. Mr. Verret's position has been filled by Mr. Hamilton P. Agee, a graduate of the Sugar School, who has been assistant chemist on the station since his graduation.
STATION No. 2.

STATE EXPERIMENT STATION, BATON ROUGE.

Mr. S. E. McClendon has conducted the experiments at the farm during the past year in a very satisfactory manner. Many experiments, begun years ago, and regarding which progress has been reported from year to year, have been continued. These experiments have embraced comparative tests of fertilizers on corn, cotton and other crops, as well as variety tests. The results of several years’ work are being tabulated for publication.

SORGHUMS.

About 100 varieties of sorghums were planted, in co-operation with the Division of Seed and Plant Introduction of the United States Department of Agriculture. These were gathered from nearly every country in the world. These varieties were studied botanically at the same time their adaptability to this soil and climate was under consideration. The information gained will be of considerable practical value in the study of forage crops for Louisiana.

ROTATION EXPERIMENTS.

In our rotation experiments with cotton, followed the next year by corn and cow peas, which, in turn, are followed by oats and cow peas, and then again by cotton, results have been in keeping with previous records. This system gives five crops in three years. Duplicates of these experiments are carried on at Calhoun. It now seems that some method of rotation similar to the above, with the addition of minor crops, will prove the most effective to combine with the cultural method of raising cotton in the boll weevil infested territory.

SOJA BEANS.

We have been trying to find a variety of soja beans well suited to Louisiana soil and climate. Where this plant can be raised successfully, as it can be in some of the Southern States, it has qualities that render it often more desirable than the cow pea. We secured through the National Department of Agriculture varieties of soja beans from all foreign countries where this plant is grown. While our hopes have not been realized, some of these varieties, we believe, will afford a good working basis to breed from to secure what is desired.
ALFALFA.

This plant does not seed well in Louisiana, and it is much more profitable to use it for hay only than to try to produce our seed supply. Sufficient interest is now being taken in this crop to render it very desirable to learn our best source of seed. We have taken up this problem during the past year. Here again we are working in co-operation with the National Department of Agriculture, having secured through their kindness seeds from the different parts of the United States and from a number of foreign countries. These seeds were planted last October, and interesting and valuable results are promised by the present condition of the crop.

Experiments to determine the fertilizer requirements of alfalfa are also being carried on. These experiments are duplicated at Audubon Park, New Orleans.

OATS.

Another new line of work taken up is that of determining the fertilizer requirements of our oat crop. Interest in this crop is rapidly increasing throughout the greater portion of the State.

COTTON.

Our cotton experiments embrace tests of varieties as to earliness, productiveness, resistance to disease, per cent of lint secured at the gin, etc. These experiments are a continuation of work begun quite a number of years ago. The same can be said of the experiments with fertilizers for cotton. Results of sixteen years will be tabulated and publication made therefrom during the present year. Practically the same experiments have been carried on at all three stations, with two years' interruption at Audubon Park.

We have made observations regarding the number of bolls set at different periods during the early summer by different varieties of cotton, together with a study of the characters of stalk that give a maximum amount of early bolls. Where the boll weevil is present, it is more important to secure the early "setting" of bolls than it is to have early maturity of a portion of the crop. Consideration of the boll weevil has made it necessary to greatly modify our ideas as to what qualities are to be sought in the cotton stalk. Formerly, for our rich lands, we desired a stalk with a central stem with small side branches,
because of the tendency of large branches near the ground to split off under the load of fruit and foliage. Now we desire the very characteristic we previously sought to get rid of. A stalk that produces vigorous branches near the ground, with short nodes, will produce more bolls at an early period than will a stalk of central axis, because there are more branches producing bolls. Since the weevil will destroy the top crop, splitting of stalks from the load of fruit is no longer a consideration. Again, it becomes desirable to use more quickly available fertilizer, that will hasten the early growth, and be exhausted by the time the top crop would come on. Of course, these conditions raise new problems that should be carefully worked out. It is hoped that we may, another year, secure the services of a man to devote his whole time to a study of the cotton plant.

RUST-PROOF COTTON.

Various diseases, all commonly designated as "rust" maladies that defoliate the plant, are nearly always more or less destructive in the greater portion of the State. Three years ago the writer began selecting plants that retained their foliage to the greatest degree in the midst of defoliated plants. Two years' results have clearly demonstrated that resistance in the plant to these diseases can be materially increased by selection, and the yield of lint very materially increased thereby.

Every effort that we have made along the line of selection has shown the cotton to be a responsive plant, and it is greatly to be deplored that more intelligent attention is not given to the selection of seed of this staple crop.

SOILING EXPERIMENTS.

Experiments in feeding green sorghum to beef cattle were conducted with satisfactory results until the appearance of disease among the cattle, which is noted further on, interrupted the work. Eight steers were fed for a period of two months. The details of this work will be published when results are verified by further investigation.

This work will be continued the coming summer. Silos will also be erected and a study of silage begun. In view of the increasing interest in live stock growing in the State, a number of interesting problems along the lines indicated above are being presented by the inquiries of the farmers.
BOLL WEEVIL.

The Mexican cotton boll weevil has invaded eleven parishes of the State. This year the baneful effects of this insect will be very pronounced in all of the Red River section above Alexandria, and in all territory west of that region. This includes much of the best cotton land in the State. The stations are taking an active part in the efforts to induce the people to adopt the most approved methods of cultivation, fertilization and crop rotation for the production of maximum crops in the infested territory.

Mr. Wilmot Newell, Entomologist of the station, gives all of his time to work on the boll weevil and other pests, under the direction of the Crop Pest Commission. As noted elsewhere, the station is doing work in the way of experimenting in forcing cotton to early fruiting, as well as along other lines, the results of which have a direct bearing on the boll weevil problem.

CATTLE TICK AND TEXAS FEVER.

As previously reported, this station evolved a system of eradicating the cattie tick that was thoroughly practicable. Further demonstrations have been carried on along these lines, with excellent results.

In November, 1905, the directors of the stations of Louisiana and Tennessee called a conference on the tick problem, with a view to organizing a concerted effort to begin a work of tick extermination throughout the South. Resolutions were passed asking Congress to make a special appropriation for beginning this work. A committee was appointed to conduct a campaign of education on this special topic, and to endeavor to bring the matter before the National Congress. It is gratifying to know that a special appropriation has been asked for this work, and Louisiana's Congressmen are taking an active interest in securing favorable consideration of the bill carrying the appropriation.

RICE EXPERIMENTS.

We have made preliminary arrangements for conducting experiments, in co-operation with the National Department of Agriculture, in testing a large number of varieties of rice, studying the rice plant from a botanical viewpoint, and for the determination of the influence of fertilizers on the productiveness of grain, milling qualities, etc. This work was begun last year in Texas, but the conditions under which it was conducted were
not conducive to the best results, and the Department has expressed a willingness to move this work to Louisiana. Under the agreement of co-operation one of our senior students will be placed in charge of the work and his salary met by the National Department. This station will secure land and water facilities. The results of these experiments will be published jointly or separately by the two co-operating parties, as may seem most desirable.

As soon as the busiest season for analysis of fertilizers and feedstuffs is over, we have planned to begin experiments determining the digestibility of rice as a food for man.

HORTICULTURAL DEPARTMENT.

The work of the Horticultural Department has been along general gardening lines during the year, under the direction of Prof. F. H. Burnette. Special emphasis has been given to the growing of sweet potatoes and onions under fertilizer tests, tomatoes, winter cauliflower, winter cabbage, experiments in growing vegetables under canvas and pecan propagation. Reports of these investigations will appear in due time. A number of new varieties of the different fruits have been added to the orchard, among them the citranges from the United States Department of Agriculture.

The interest in commercial growing of pecans continues to increase. Our supply of bulletins on this subject has been almost exhausted, so great has been the demand. The literature on pecan propagation and cultivation is so meagre that Louisiana is called upon to supply a number of other States. The Horticulturist of this station, with Mr. Robert Glenk, installed the Louisiana exhibit at Portland, Ore., and had charge of the exhibit for some weeks. The exhibit was said to have been a very creditable one, and to have attracted much favorable comment.

The Horticulturist has edited the proceedings of the Louisiana State Horticultural Society.

VETERINARY DEPARTMENT.

The principal experiment work engaged in during the year by the Veterinary Department has been in connection with the intestinal parasites affecting sheep, chiefly those producing the condition known as "nodule disease of the intestines." A series of experiments have been conducted along this line during the past several years, and results published in bulletin form. The
experiment of the past year, however, was to endeavor to raise lambs free from nodule disease of the intestines without having to separate them from their diseased mothers.

Results of this experiment were published in Station Bulletin No. 83, and aroused a great deal of interest among sheep men all over the United States, as well as eliciting favorable comment from agricultural journals abroad. It is hoped to further continue this line of experiment.

Bulletin No. 84, entitled "Texas Fever: A Summary of Our Knowledge of the Subject to Date," was also prepared by the Department during the year. Information regarding Texas fever had been so much sought after that previous literature regarding it became completely exhausted. The object of the last bulletin was to give, in summarized form, the facts previously published, in order to supply the demand which was constantly being made upon the station for such information. Requests for this bulletin have come from all parts of this country, as well as from foreign countries in which Texas fever, or the same disease, only known by some other name, exists. Several hundred copies were sent to Tennessee Experiment Station, at the request of the Director, for distribution in the tick-infested sections of that State, and a number were asked for by some of the veterinary colleges to supply the students with information regarding this particular disease.

The Department has been closely identified with the problems connected with economic stock-feeding throughout the State, more particularly in the sugar belt, and in connection with the work mules. This has been along the lines of balanced rations made up of home products, and the systematic feeding of them to stock. The economy of such system, both as to feeds and feeding, has, on a great number of our sugar estates, resulted in a saving of from 10 to over 50 per cent.

The importance of this subject has been brought to the attention of stock owners by lectures and papers presented at various association meetings, by personal interviews, and by a large amount of correspondence. The increased interest in this economy has been so manifest of late that the Department has at present in course of preparation a special bulletin on feeding, which it hopes to have ready for publication in the very near future, in order to supply our stock-feeders with intelligent information regarding this important problem.
Importers of pure-bred cattle from above the Texas fever line continue to take advantage of the offer previously made by the station, to artificially immunize such animals free of cost except for feed and attention, and which, we believe, has been the means of persuading many to purchase and import pure-bred animals, who, otherwise, would not have done so.

During the summer, it was observed that a number of young cattle on the station farm were suffering from internal parasitism. The parasites, or worms, were found to infest the lungs, stomach and bowels of the cattle, and a number of the animals became so badly infested that they succumbed. The varieties of worms found on post-mortem were: The *Strongylus microurus*, or lung worm; the *Strongylus contortus*, or stomach worm, which also infests sheep; the *Uncinaria radiata*, a hook-worm in the intestines. The cattle in question were purchased outside of the State, and it is possible that they may have been infested with these worms when they came on the station, as no previous indication of such a condition had been observed on the farm. However, we have received the same species of worms from animals that died thirty miles north of Baton Rouge, and Prof. Guilbeau reports having collected the species at one of the slaughter houses of Baton Rouge, some two or three years ago. No animals have been lost from this disease on the ranch from which these cattle were purchased.

The older animals did not suffer to any extent, the younger ones being mostly affected, which is generally the ease with parasitic diseases. The disease is now apparently under control, and we do not expect to lose any more animals.

The Department's correspondence increases from year to year, and there is hardly a disease affecting live stock in the State that information regarding it has not been sought after. Inquiries relative to the various breeds of live stock best adapted to Louisiana conditions have also been quite numerous, showing a decided tendency on the part of our people to improve the quality of their animals.

The Veterinary Department, although not taking part in Farmers' Institute work in the field the past year, superintended the entire clerical work in connection with the different corps and itineraries for the State Board of Agriculture and Immigration.
At the present time this Department is assisting the Farm Department in conducting some feeding experiments with cattle, which we believe will give valuable results. The work has been in progress only a short time. The results will be published in bulletin form when the work is completed.

STATION REPRESENTATIVES AT SCIENTIFIC ASSOCIATION MEETINGS.

The station has been represented at the following meetings of associations representing scientific work:

The Fertilizer Convention at Shreveport was attended by the Director of the stations, the Assistant Director and Horticulturist from Calhoun, the Chief Chemist from New Orleans, the Entomologist and Horticulturist from Baton Rouge. All of the parties mentioned presented papers at the convention, and took an active part in the discussions.

The State Agricultural Society and the Louisiana Stock Breeders' Association held their annual joint meeting at Shreveport and was attended by the Director of the stations, the Assistant Director and the Horticulturist from Calhoun, the Veterinarian (who is Secretary of the Associations), the Horticulturist and the Entomologist from Baton Rouge.

The President of the University and the Director of the Stations represented the institution at the meeting of the Association of Agricultural and Mechanical Colleges and Experiment Stations, in annual convention in Washington, D. C. Immediately preceding this convention, the Director attended the convention of Farmers' Institute Workers of America at Washington, and a few days later attended the annual meeting of the Commissioners of Agriculture of the Southern States, at Richmond, Va. Reference to the tick conference at this convention is referred to elsewhere. At the solicitation of the honorable Secretary, James Wilson, the Director of the stations made two trips to Washington, D. C. (at the expense of the United States Department of Agriculture), to attend conferences of Directors of Experiment Stations of the Southern States.

The station was represented by the Veterinarian at the annual meeting of the American Veterinary Medical Association in Cleveland, Ohio, and at the Sixth International Live Stock Exposition at Chicago, Ill.

The Horticultural Department was represented at the annual
convention of National Association of Nut Growers, at Dallas, Texas.

At the convention of the American Association for the Advancement of Science the stations were represented by the Horticulutrist, Veterinarian and Director from Baton Rouge, the Assistant Director and several associates from New Orleans.

Excepting the Shreveport convention and those at Washington, and as noted above, the delegates to these conventions have met their own expenses.

A special run of the sugar house was made for the benefit of the Association for the Advancement of Science, and the Association in a body visited the station. About 150 of the distinguished scientists spent several hours in the sugar house and laboratories.

The stations always have a representative at the monthly meetings of the sugar planters in New Orleans, and have frequently contributed leading papers for discussion.

**CHANGES IN STATION STAFF.**

On the first of August, 1905, Mr. P. L. Hutchinson, Chief Chemist, and one of the most efficient men that we have ever had, resigned to accept a position with the National Department of Agriculture. Mr. R. C. Holtzelaw, Assistant Chemist, resigned in November to accept a position with a commercial firm. Mr. G. H. Hardin, Assistant Chemist, was given a leave of absence during the grinding season, and accepted a position in a sugar house. He is now at work again in the laboratory. Mr. A. T. Felt, Assistant Chemist, was employed in August and resigned in December to accept a position with a commercial firm. Mr. A. B. Joffrion and Mr. R. L. Menville, graduates of the University last year, have been added to our staff. Mr. J. E. Halligan has been promoted to the position of Head Chemist. Mr. H. C. Tallis has been made Secretary and Librarian at the Baton Rouge office.

**FARMERS’ INSTITUTES.**

The members of the station staff at all of the stations continue to take an active part in Farmers’ Institute work.

The Director of the stations also visited quite a number of the Summer Normal Schools for teachers, and delivered lectures on teaching agriculture in public schools. This is the first year this work has been undertaken. The results in general have been encouraging.
ANALYSIS OF FERTILIZERS, FEED-STUFFS AND PARIS GREENS.

The number of analyses made the past year of fertilizer samples was about 25 per cent less than that of the previous year. This is the first opportunity to report on the year's work under the feedstuff law, as that has been in operation only sixteen months. During the first twelve months of the operation of this law we analyzed 1600 samples of mixed feeds.

The number of Paris green samples analyzed was about the same as was received in 1904.

Under the laws for controlling the sale of fertilizers, feedstuffs and Paris greens, every citizen in the State is amply protected from fraud and imposition by unscrupulous dealers, and there exists absolutely no cause for distrust in the purchase of these articles, if the farmer will but claim the protection offered him. The sellers of good wares are protected, as ample facilities are afforded them of properly advertising their goods.

The accuracy of the work of the Analytical Department has been such as to retain the absolute confidence of dealers and purchasers, and with tankage fertilizers the buyer and seller frequently make a contract to settle the price of the fertilizer on the basis of our analysis of the samples taken.

All brands of fertilizers must have stamped in plain letters and figures on the sack the guaranteed composition, and each sack must be tagged by the Commissioner of Agriculture. The repeated inspection and analysis of the different brands is for the purpose of seeing that the manufacturer constantly maintains his product up to the standard guaranteed. The same remarks would hold good as applied to mixed feeds.

Paris green is largely used in this State as an insecticide, chiefly for the destruction of the cotton caterpillar, whose ravages are frequently so injurious. This chemical consists chiefly of the "arsenite of copper," with a small proportion of the acetate of copper, and a first-class article should contain not less than 50 per cent of arsenious' acid, known in its pure state as white arsenic. This article is frequently adulterated, and there are abundant opportunities for fraud in its purchase.

All of the samples analyzed the past year were up to the standard.

At the present time, when we read of litigations in Northern
States, growing out of insufficient protection of the farmers against frauds and adulterations in fertilizers, it is gratifying to know that we have outstripped a great agricultural State like Illinois in this line of progress.

During the past year three more Southern States have followed Louisiana's example in making an effort to secure legislation to control the sale of mixed feeds. These efforts have been only partially successful, but in a few years, it is evident, all of the Southern States will have similar laws. Our law for the control of feedstuffs is somewhat defective and efforts should be made to perfect it at the next meeting of the Legislature.

MISCELLANEOUS ANALYSES.

The main bulk of fertilizer samples comes in during the first six months of the year. In order to handle this business with promptness we are forced to employ a greater number of chemists than are required for the dull season. This affords opportunity during the late summer and early fall to do considerable miscellaneous work for the accommodation of the public. This includes the analyses of soils, waters, deposits that are
thought to contain minerals, fertilizers or other valuable elements, and many other classes of samples, the results of which may or may not be of public or semi-public interest, according to results obtained. No charge is made for this work.

NEW LABORATORY.

During August, 1905, the laboratory equipment was moved from New Orleans to Baton Rouge. An addition to the station laboratory was constructed to give ample facilities for the work, and we now have probably the best and most conveniently arranged laboratory for this class of work that is to be found in the South.

STATION NO 3.
NORTH LOUISIANA EXPERIMENT STATION.

This station is located at Calhoun, Ouachita Parish, in the hill section, and is now under the direction of J. G. Lee.

As noted in the last annual report, fire destroyed the tobacco barn, laboratory and residence a little over a year ago. The insurance on these buildings, amounting to $3165, was promptly paid by the Louisiana Fire Insurance Company.
A new residence has been erected at a cost of about $2500 complete.

Instead of rebuilding a chemical laboratory, we have put up a two-story building at a cost of a little over $3000, containing a large library and office room, a comfortable room for the exclusive use of ladies, a museum room and sleeping rooms that can be used by visitors when all can not be entertained at the cottage. It is the opinion of all visitors since the completion of the building that this fills a long-felt want. It is our purpose to fill the museum room with specimens of agricultural plants grown on the station, photographs of crops and animals, charts and diagrams, illustrating investigations that have been carried on at the station.

FARM CROPS.

The experiments on cotton, corn and forage crops have been a continuation of the lines of work reported in previous years.

We are now clearing additional land to enlarge our pasture, preparatory to extending operations in general farming, taking
up a number of experiments in the way of getting more accurate data as to the value of live stock in aiding to maintain the fertility of soils, or renew productiveness of worn soils.

THE DAIRY.

The dairy at the station has never been fully re-established since it was necessary to destroy a number of our herd in order to get clear of tuberculosis. We have recently secured some high-bred Jersey cows, and expect to put the dairy work in shape to give scientific and practical results more pronounced than has heretofore been possible.

TRUCK CROPS.

The past season has been very unfavorable for nearly all truck crops. The plan by which we had hoped to work in cooperation with the farmers and make considerable shipments of truck to distant markets was almost a complete failure, due very largely to unfavorable weather.

Some of the truck crops on the station were very successful, especially the late crops, and good markets were found for most products at Shreveport and Vicksburg, at prices that would be profitable to the farmer if he would supply what is desired. It is to be regretted that such an unfavorable season should have been experienced just at this time. While the disappointments have been somewhat discouraging, we feel very much gratified to note the general interest being manifested in truck and fruit growing throughout North Louisiana. The station at Calhoun has contributed a very important part in awakening and stimulating this interest.

The station will have this year an acre of strawberries and an acre of asparagus for commercial experiments.

We are putting out a stock of grapes for future work in breeding, using the scuppernong and muscadine grapes to cross with the more highly improved varieties, hoping to secure thereby a prolific bearing strain that will retain the resistance to destructive diseases that characterize the scuppernong and muscadine. We are also introducing the improved dewberries and blackberries. The fine quality and hardiness of these native fruits would seem to indicate that we should be able to produce perfection in these fruits by giving the subject proper attention.
FRUIT CANNING.

Work has been continued along the line of canning various fruits, with very satisfactory results. The tomatoes grown and canned at Calhoun have been pronounced by competent judges to be of very superior quality. Several housekeepers have said that they are equal to, if not better than, the best tomatoes that can be had on the market. While it was our purpose to show that the crop could be profitably canned at times when the market for fresh tomatoes was dull, we have shown that it could be made remunerative to raise tomatoes solely for canning purposes. Another result of the work along this line has been to set the people to thinking more of the art of preserving fruits and vegetables in attractive form and for home use, and the growth of an enterprise that contributes greatly to better home living has been very marked.

Bulletin No. 81, published early in the year, gives general instructions for preparing hotbeds, cold frames, fertilizing and cultivating truck crops, varieties best suited to the soil and climate of North Louisiana, and other information necessary to successful truck growing. A report is also given of the results of experiments in marketing fruits and vegetables. The second portion of the bulletin deals with canning and preserving, giving full directions for successful work of this nature.

LIVE STOCK.

There has been no change in the plan of work previously reported along the line of live stock breeding and feeding, save that already referred to in connection with the dairy. It will be our policy in the future to carry a less number of breeds and a larger number of individuals of the breeds retained for experimental purposes.

Preparations are now being made to carry on some experiments with poultry on a larger scale than has heretofore been undertaken. Interest in this subject has been very manifest for the past year, and we have received a great many inquiries for bulletins on the subject.

AGRICULTURAL FAIRS.

The long years of earnest work of Dr. Stubbs and Major Lee and their associates in stimulating an interest in an annual fair at the station are coming to fruition in the successful parish fairs now being conducted mainly by men who caught their
inspiration from Calhoun. It was a long time before the people could be induced to begin, months before hand, to prepare material for these fairs. They have caught the proper spirit, however, and this has resulted in bringing the station in touch with many people whom it would not have reached otherwise. When they become interested in the fairs they begin to study more closely varieties of farm crops, methods of fertilization, cultivation, etc. Many of them come to the station for this information. This is but one illustration of the many ways in which we are aiding the people in raising their standards in agricultural lines. We expect to extend this work as much as possible, and establish a correspondence school among the boys and girls that are on the farm, and get them interested in making special preparation for these fairs, and at the same time in studying the fundamental problems of successful farming.

STATION STAFF.

Mr. George H. Malone, dairyman, resigned during the summer to engage in other business. His place will soon be filled by a competent dairyman from a dairy school. Mr. D. N. Barrow, Assistant Director, resigned the first of January, 1906. Major J. G. Lee has been appointed to fill the vacancy. The work there is not new to Major Lee, as he had immediate direction under Dr. Stubbs during the period of the station's greatest development. The people of North Louisiana all know him, and he has their undivided sympathy and support. E. J. Watson, Horticulturist, and T. I. Watson, in charge of the farm plats, are most competent to carry on the work committed to them, and both enjoy the confidence and esteem of the people. I therefore feel very confident that the influence of this station will continue to grow, and that its usefulness will be felt more keenly and over a constantly expanding territory.

STATE GEOLOGICAL SURVEY.

Dr. G. D. Harris, with two assistants, is now in the field, on surveying work, where they will remain until the middle of March. Dr. Harris devotes one-half of his time to the survey work, and one-half to Cornell University. During the past year three publications have been issued, giving the results of work done.
Bulletin No. 1, on the "Underground Waters of Louisiana," contains ninety-one pages, with maps, diagrams and half-tone plates from photographs, and an appendix of seventy-three pages, giving a dictionary of altitudes of North Louisiana.

Bulletin No. 2 details the work on "Terrestrial Magnetism and Meridian Lines." This work will be of exceedingly great value to surveyors and engineers. It covers forty-nine pages, exclusive of a considerable number of maps and diagrams.

Bulletin No. 3 is a report on the establishment of tide gauge work in Southwest Louisiana. This gauge is now maintained, and the services of a keeper paid for, by the United States Coast and Geodetic Survey. This Department of the National Government agreed to maintain the gauge if we would install it and begin the record. Since the last annual report to your Excellency our part of the work has been completed. We can secure duplicates of the records whenever we desire them.

Results of this work will be of scientific interest and of practical value. In a few years we should get some reliable data as to whether or not the coast marsh of that region is sinking. Determination of the mean tide level will be of great value in determining the boundaries of certain property interests that are destined to be of increasing importance.

Bulletin No. 4 is nearly completed, and will be published in a short time. It deals with the character and extent of the rock salt deposits of Southwest Louisiana.

Work during the summer and the latter part of the year has been carried on in the region of Winnfield, in North Louisiana. Work was taken up in that district on account of the sandstone, limestone and salt deposits in its limits. It seemed desirable to have complete and accurate maps of certain areas of the State most interesting from a geological standpoint, not alone for their own value, but to encourage co-operation from the National Government in the construction of such maps for territory in Louisiana. Results here would also be more patent and in many respects furnish the best basis for future geological work. We have been mapping in great detail an area of nine townships about Winnfield. A report on this work is also well under way and will appear soon.

Investigations in continuation of our work on clay, lignites and oil will be taken up at the earliest possible date.
SOIL SURVEY.

The Bureau of Soils of the Department of Agriculture at Washington has re-assigned a corps of men to work in Louisiana. Since the last report of the Director, East Baton Rouge Parish has been surveyed. Winn Parish will next be surveyed. This work is done entirely at the expense of the United States Department of Agriculture, and the results furnished to the State Geological Survey. A limited number of copies of the publication are sent us for distribution. Dr. Whitney, Chief of the Bureau of Soils, has been exceedingly kind in offering to assist Louisiana to the fullest extent possible from his available funds. In the future he will survey the parishes of which topographical surveys have been made, so that when we have completed the work along all of these lines it can all be correlated and be of the greatest possible value.

UNITED STATES GEOLOGICAL SURVEY.

A few years ago co-operative work with the United States Geological Survey was begun under an agreement to make topographical surveys of certain portions of Louisiana. We contributed $2500 toward the expenses of this survey for each quadrant surveyed. Last year an effort was made to get the National Department to meet all the expense of this work, so that we would be enabled to do more work in other lines. The following letter will show how generous the Director of the Survey has been to the plea presented to him:


Director W. R. Dodson, Louisiana Agricultural Experiment Station, Baton Rouge, La.:

Sir—Repeating to yours of February 18, urging that this survey map Baton Rouge, La., quadrangle—

I take pleasure in advising you that in plans for topographic surveying for the season of 1905 a sufficient sum has been provided to commence the survey of this area, which covers about 1000 square miles. The amount of money which would be required on this one quadrangle, however, is so great, about $9000, that it will probably be another year at least before the work can
be completed. This work will be commenced early in the fall by a party under the charge of Mr. Duncan Hannegan, topographer. Very respectfully,

(Signed) Chas. D. Walcott, Director.

It is hoped that the work will be continued till the whole State is accurately surveyed. This work will be of great value in construction of roads, railroads, drains, and will be of inestimable value in mapping the State. In the section of the country where we seek immigration the idea is quite prevalent that Louisiana is one vast flat, mainly composed of swamp land and inhabited by mosquitoes, alligators and snakes. A topographical map of the State would be of greater value than any other printed literature in dispelling this erroneous impression.

The following constitutes the present staff of the stations:

W. R. Dodson, A. B., B. S., Director, Baton Rouge, La.
R. E. Blouin, M. S., Assistant Director, Audubon Park, New Orleans, La.

J. G. Lee, B. S., Assistant Director, Calhoun, La.
S. E. McClendon, B. S., Assistant Director, Baton Rouge, La.

C. A. Browns, Jr., Ph. D., Chemist, Audubon Park, New Orleans, La.


Clifford Waldron, Farm Manager, Audubon Park, New Orleans, La.

J. K. McHugh, Secretary and Stenographer, Audubon Park, New Orleans, La.

G. D. Harris, M. S., M. A., Geologist, Baton Rouge, La.


F. L. Whitney, Assistant Geologist, Baton Rouge, La.

J. E. Halligan, B. S., Chemist, Baton Rouge, La.

J. A. Hall, B. S., Chemist, Baton Rouge, La.


G. H. Hardin, B. S., Chemist, Baton Rouge, La.

Roger P. Swire, Treasurer, Baton Rouge, La.

L. C. Reid, Farm Manager, Baton Rouge, La.

Wilmon Newell, M. S., Entomologist, Baton Rouge, La.

F. H. Burnette, Horticulturist, Baton Rouge, La.

H. C. Tullis, Secretary and Librarian, Baton Rouge, La.
E. J. Watson, Horticulturist, Calhoun, La.
Ivy Watson, Farm Manager, Calhoun, La.

Dairyman and Poultryman, Calhoun, La.

The bulletins and reports will be sent free to all farmers by applying to the Director of the stations, Baton Rouge, La.

The following is a copy of the financial report sent to Washington, D. C., in compliance with Act appropriating money for Experiment Stations:

FINANCIAL STATEMENT.

<table>
<thead>
<tr>
<th>Cr.</th>
<th>Dr.</th>
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<tr>
<td>Receipts from the Treasurer of the United States for the year ending July 1, 1905</td>
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<td>By salaries</td>
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<tr>
<td>Publications</td>
<td>1,329 02</td>
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We, the undersigned members of the Board of Agriculture and Immigration, to whom is entrusted the disbursement of the above funds, do hereby certify that we have examined the accounts of the Experiment Station of the Louisiana State University and Agricultural and Mechanical College for the fiscal year ending June 30, 1905, and have found the above classification to be correct, and the receipts for the time named are shown to be $15,000, and the corresponding disbursements are $15,000, for all of which the proper vouchers are on file and have been examined by us and found correct.

(Signed)

J. G. Lee,
Commissioner of Agriculture and Immigration.

H. L. Fuqua,
Vice President Board of Supervisors and Ex-Officio Member of Board of Agriculture.
To receipts from other sources than the United States for
the year ending July 1, 1905:

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<tr>
<th>Item</th>
<th>Cr.</th>
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<td>Cash on hand July 1, 1904</td>
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<td>Insurance on buildings burned</td>
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<td>Sale of farm products</td>
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<tr>
<td>Miscellaneous</td>
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<tr>
<td>Received from State appropriation</td>
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<tr>
<td>By salaries</td>
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<tr>
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<td>Freight and express</td>
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<td>Chemical supplies</td>
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</tr>
<tr>
<td>Seeds, plants and sundry supplies</td>
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<td>Fertilizers</td>
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<tr>
<td>Feeding stuffs</td>
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<td>Tools, implements and machinery</td>
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<td></td>
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<tr>
<td>Furniture and fixtures</td>
<td>959 88</td>
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<td>Scientific apparatus</td>
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<td>Live stock</td>
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<td>Traveling expenses</td>
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<td>Contingent expenses</td>
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<td>Buildings and repairs</td>
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<tr>
<td>Insurance</td>
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<tr>
<td>Publications</td>
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<td>Postage and stationery</td>
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<tr>
<td>Library</td>
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<td>Balance on hand July 1, 1905</td>
<td>15,612 53</td>
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</tr>
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</table>

$36,592 54 $36,592 54

The reports of receipts and expenditures of the Geological
Survey and the fertilizer fund are examined by the same Board
as the above, and approved by them. They are sworn to by the
Director of the stations, and have been published in the Baton
Rouge Times. These reports are published twice a year.

The following bulletins are available for distribution to par-
ties who are interested in the subjects to which they pertain:
Bulletin No. 60—Charbon (Anthrax).
Bulletin No. 61—Rice; Preparation, Cultivation, etc.
Bulletin No. 62—Report of North Louisiana Experiment Sta-
tion, Calhoun, for 1899.
Bulletin No. 66—Sugar Cane; Experiments in Cultivation.
Bulletin No. 67—Broom Corn; How to Grow and Cure It.
Bulletin No. 68—Home-Grown versus Purchased Seed.
Bulletin No. 69—Pecans and Pecan Culture.
Bulletin No. 70—Cane Borer (Diatroea Saccharalis).
Bulletin No. 71—Report of North Louisiana Experiment Station, Calhoun, for 1901.
Bulletin No. 72—Forage Crops, Grasses and Clovers.
Bulletin No. 74—Sheep; Different Breeds, Internal Parasitic Diseases, etc.
Bulletin No. 75—Preservation of Cane Syrups, and Yeasts, Moulds, Bacteria and Enzymes.
Bulletin No. 77—Rice.
Bulletin No. 78—Comparative Results of Seedling Sugar Canes, D. 74 and D. 95, with Our Home Sugar Canes (Louisiana Striped and Louisiana Purple).
Bulletin No. 79—Results of Experiments with Nodule Diseases of the Intestines of Sheep.
Bulletin No. 81—Results of Experiments in Production and Marketing Fruits and Vegetables, and Canning Fruits and Vegetables on a Small Scale at the North Louisiana Experiment Station, Calhoun, La.
Bulletin No. 82—The Texas Fever Cattle Tick Situation, and the Eradication of the Tick by a Pasture Rotation System.
Bulletin No. 83—Results of Further Experiments with Nodule Disease of Sheep; Bare Lot Method of Raising Lambs.
Bulletin No. 84—Texas Fever.