1909

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

W R. Dodson

Follow this and additional works at: http://digitalcommons.lsu.edu/agexp

Recommended Citation
Dodson, W R., "Twenty-First annual report of the agricultural experiment stations of the Louisiana State University and A. & M. College." (1909). LSU Agricultural Experiment Station Reports. 565.
http://digitalcommons.lsu.edu/agexp/565

This Article is brought to you for free and open access by the LSU AgCenter at LSU Digital Commons. It has been accepted for inclusion in LSU Agricultural Experiment Station Reports by an authorized administrator of LSU Digital Commons. For more information, please contact gcoste1@lsu.edu.
TWENTY-FIRST
ANNUAL REPORT
OF THE
AGRICULTURAL EXPERIMENT STATIONS
OF THE
LOUISIANA STATE UNIVERSITY
AND
AGRICULTURAL AND MECHANICAL
COLLEGE
FOR 1908
TO THE GOVERNOR

BY
W. R. DODSON, DIRECTOR.

BATON ROUGE:
The New Advocate, Official Journal of the State of Louisiana
1909
Louisiana State University and A. & M. College

Louisiana State Board of Agriculture and Immigration

EX-OFFICIO.
GOVERNOR JARED Y. SANDERS, President.
HENRY L. FUQUA, Vice President of Board of Supervisors.
CHAS. SCHULER, Commissioner of Agriculture and Immigration.
THOMAS D. BOYD, President State University.
W. R. DODSON, Director Experiment Stations.

MEMBERS.
R. S. Moore, Plaquemines.
Henry Gerac, Lafayette.
John T. Cole, Monroe.

John J. Henderson, Lagan.
J. E. Bullard, Belmont.
R. E. Thompson, Wilson.
Jeff D. Marks, Crowley.

STATION STAFF.
W. R. DODSON, A. B., B. S., Director, Baton Rouge.
HAMILTON P. AGEE, B. S., Assistant Director, Audubon Park, New Orleans.
J. B. GARRETT, B. S., Assistant Director, Calhoun.
S. E. MCKENDON, B. S., Assistant Director, Baton Rouge.
P. A. YODER, Ph. D., Chemist and Sugar Maker, Audubon Park, New Orleans.
W. G. TAGGART, B. S., Assistant Chemist, Audubon Park, New Orleans.
R. E. GRAHAM, B. S., Assistant Chemist, Audubon Park, New Orleans.
W. M. OWEN, B. S., Bacteriologist, Audubon Park, New Orleans.
J. K. McHugh, Secretary and Stenographer, Audubon Park, New Orleans.
A. SCHEER, Farm Manager, Audubon Park, New Orleans.
F. L. WHITNEY, Assistant Geologist, Baton Rouge.
J. E. HALLIGAN, B. S., Chemist, Baton Rouge.
H. L. GREEN, B. S., Assistant Chemist, Baton Rouge.
A. P. KERR, B. S., Assistant Chemist, Baton Rouge.
J. C. SUMMERS, B. S., Assistant Chemist, Baton Rouge.
R. BAUS, B. S., Assistant Chemist, Baton Rouge.
R. G. FOLLER, B. S., Assistant Chemist, Baton Rouge.
W. D. REID, B. S., Assistant Chemist, Baton Rouge.
R. G. TILLERY, B. S., Assistant Chemist, Baton Rouge.
ROGER P. SWIRE, Treasurer, Baton Rouge.
WILMEN NOTWELL, M. S., Entomologist, Baton Rouge.
G. L. TIEBOUT, B. S., Horticulturist, Baton Rouge.
C. W. EDGEWORTH, Ph. D., Plant Pathologist, Baton Rouge.
J. T. TANNER, B. A., Secretary and Stenographer, Baton Rouge.
IVY WATSON, Farm Manager, Calhoun.
E. J. WATSON, Horticulturist, Calhoun.
J. O. LEE, Jr., B. S., in Charge of Feeding Experiments, Baton Rouge.
E. W. KERR, M. E., Professor Mechanical Engineering, Baton Rouge.
E. M. PERCY, B. S., Assistant Mechanical Engineer, Baton Rouge.
Louisiana State University

AND

Agricultural and Mechanical College

OFFICE OF STATE EXPERIMENT STATIONS.

Baton Rouge, La., Feb. 1, 1909.

To His Excellency, Jared Y. Sanders, Governor of Louisiana:

Sir—In compliance with the provisions of an act of the National Congress of March 2, 1887, commonly known as the Hatch Act, and of March 16, 1906, known as the Adams Act, providing for federal appropriations for agricultural experiment stations of the several states, I submit herewith a report of work done by the stations during the year 1908, and a financial statement for the government fiscal year, July 1, 1907 to July 1, 1908.

While the receipts and expenditures of the various funds received from the State of Louisiana have been published twice annually, June 1 and December 1, as provided by State law, I have combined these two reports and submit them herewith, so as to show the receipts and expenditures for twelve months. While the time covered by this statement does not coincide with the time covered by the report of the federal fiscal year, practically the same amounts are represented as would be if the statement were pushed forward one month for beginning and close. As the report is here given it will tally with the sums of the two reports on file with the State Auditor, and no special object would be gained by making a report with dates to correspond with the date of federal funds.

Respectfully,

W. R. DODSON, Director.
STATION NUMBER ONE.

Sugar Experiment Station, Audubon Park, New Orleans, Louisiana.

The work of this station remained under the direct supervision of Mr. R. E. Blouin, Assistant Director, up to October 1, 1908, when Mr. H. P. Agee, a graduate of the Sugar School of this University, was put in full charge as assistant director. Mr. Agee had been connected with the work of the sugar station for several years, but was in charge of a sugar house in Porto Rico at the time he was elected to succeed Mr. Blouin. He returned to New Orleans in time to spend several months with Mr. Blouin, familiarizing himself with the work of the station, and in this way the inconvenience and loss due to Mr. Blouin's departure has been minimized. The extensive experience of Mr. Blouin, and his thorough knowledge of the practical and technical problems of the sugar planter, enabled him to render exceedingly valuable service in many ways to the sugar interests of Louisiana. Indeed it was this service which drew the attention of the sugar interests of Argentina to him, and led them to make him such financial inducements to enter the service of the Republic, that he could not in justice to himself remain in Louisiana.

Mr. Agee is a very strong man in his preparation for the work, and has already exemplified his ability to take care of the work at the sugar station.

I submit herewith a general statement, prepared by him, of the work done during the past year, which is followed by the statements of Dr. Yoder and Mr. Owen, of the work of their departments. I recommend that this be published with the general statement.

The work of the stations in all departments progressed in a way that is gratifying to all who know of what has been accomplished.

I have departed from the practice heretofore in submitting a general report on the whole work, and have asked the heads
of departments to submit brief statements regarding this work. These reports are here given over the signatures of the several men who have prepared them. In some instances they have been abbreviated by me.

Respectfully,

W. R. DODSON, Director.

NEW ORLEANS, LA., Feb. 1, 1909.

W. R. DODSON, Director,
Baton Rouge, La.

My Dear Sir—

I submit herewith a general statement of the work of the Sugar Experiment Station during the past year, including a statement from Dr. Yoder, of the chemical work, and of Mr. Owen, of the bacteriological work.

The good growing season and excellent harvest period that prevailed throughout the State have been of value to the field experiments of this station during the past year. The cane crop of the station may be considered as a good average in comparison with other years, in respect to tonnage and sugar content.

IRRIGATION.

Owing to the abundance and even distribution of rainfall during the growing period, there has been no occasion to use the irrigation plant, as had been frequently necessary during years past.

CULTIVATION AND FERTILIZATION.

Work along the lines of cultivation and fertilization has been a continuance of the experiments previously inaugurated for the purpose of securing data from a number of years, so as to obtain results covering such a wide range of varying seasons and conditions, as not to be vitiated by uncontrollable influence so imminent to field experimentation of all classes.

The great difference of opinion concerning the many points involved, which exists among plantation managers, bears evidence to the importance of obtaining conclusive data along such lines.
SEEDLING CANES.

In the report of a year ago, mention was made of the propagation of new varieties of cane from seed of this station. Heretofore we have been dependent upon the importation of these seedlings from the various experiment stations and botanical gardens of the tropics, where conditions are better suited for the germination of cane seed. However, it is a great pleasure to be able to say that our work along this line during the past two years has been so successful that this method of producing new varieties of cane may now be considered permanently established as an important phase of this station's work.

The first year the growth of a seedling is always dwarfed and the sugar content low, and the plants present no indication as to what they will ultimately do. These canes are planted and the second year full-sized stalks are produced, and an idea can be gotten as to which are the more desirable. The third year's results must be awaited, however, in order to obtain data as to tonnage and sugar content. The property of seed variation common to all plants is so pronounced in the cane that the widest variations in color, size, sugar content, and general manner of growth is noted in seedlings of the same cane tassel. From this variation there is a chance of securing a seedling superior in every way to the mother cane. In 1907, about one hundred plants were produced from seed, and the second year's results obtained this year show nearly all of these to be vigorous growing canes, and some of them have a sucrose content that is quite high. Approximately five hundred were obtained in 1908. All of these are planted and their development is awaited with much interest.

A third crop is at present being germinated from an assortment of seed from nearly every cane-growing locality of the world. These are again under the immediate care of Mr. A. E. Weller, who has been so successful in his previous efforts. It is not safe to say at this time if any of the canes thus propagated by us will eventually prove preferable to those at present grown on the plantations, but from the results thus far obtained the indications are promising. The hope is felt that by this means a cane combining the properties of high tonnage and high sugar content may ultimately be had.
We are indebted to the government stations of many foreign countries, as well as to private individuals, for the courtesy of sending us cane arrows or tassels. Thus far no fertile seed have ever been produced in Louisiana. The station is still in active correspondence with the other cane-growing sections of the world and is importing for trial the best seedlings that are produced elsewhere.

Reports concerning the D. 74 and D. 95 canes, now so widely grown throughout the State, and originally introduced by this station from British Guiana (Demerara), continue favorably. A tabulation of results of these canes, as compared with the home canes, is now being prepared.

**SUGAR HOUSE WORK.**

The sugar house work this season has served as a means of completing the field data on the various experiments, and in addition has afforded an opportunity of studying certain problems of sugar manufacture. Work was done on the use of formaldehyde in factory work, and experiments were inaugurated in relation to the treatment of molasses with various chemicals prior to reboiling for low-grade products.

**CANE HARVESTERS.**

There have been no further demonstrations of cane harvesters during the past year. A number of these devices which were first proved successful in the public trials held at this station, are now doing active work in the cane fields of the State. They have effected a considerable economy and have assisted materially in harvesting the past two cane crops.

Cane-harvesting machines are now attracting wide attention, and five different inventors—Luce, Hadley, Piatt, Loisel and Beauregard—have been at work on the station grounds this year, each endeavoring to perfect a machine. A special plat of cane has been set aside for the use of these men, and they are furnished whatever facilities we can offer. The problem of cutting, stripping and topping the cane by means of a machine is an extremely hard one. The obstacles which stand in the way of perfecting a machine of this character are difficult and perplexing, but it is beginning to be thought from the work done here during the past six months, that they are not insur-
mountable. Mr. Luce has made two public demonstrations of his machine this fall under the auspices of the station, in order to afford those interested an opportunity of viewing the operation of his device. The Luce harvester is drawn by mules. The topping and stripping devices are driven by a gasoline engine. The lines upon which Mr. Hadley is working are different, in that his machine is propelled and operated by a cable. Mr. Piatt is attempting a machine to be worked entirely by mule power and hopes to thus produce a machine that may be handled by ordinary plantation labor.

IMPROVED IMPLEMENTS.

The station welcomes at all times the testing of new or improved implements either for experimentation or public demonstration. We have been presented by one of the leading implement companies with a complete outfit of their latest models of plows, cultivators, etc. During the next few months there will be tests made of certain recently patented drainage devices.

MISCELLANEOUS.

Variety tests on cotton and corn have been continued. Forage crops have received attention, as heretofore. This work is co-operative, in a measure, with the Department of Agriculture, which annually distributes clovers, peas, alfalfa and other leguminous crops for trial.

An assortment of fiber crops is grown. We have this year supplied inventors of decorticating machines with material for tests. The growth of the Phormium tenax, a newly introduced fiber plant that grows in the waste marshes of Australia, is being watched with interest.

Renewed interest is being manifested in the use of bagasse as a paper stock. One of the large manufacturing plants making paper board is working with us to test the adaptability of bagasse for this purpose. Their attention has also been called to the waste cane tops, and plans are being made for an investigation of the paper-making qualities of this by-product of our industry. Certain experts have expressed opinion that this material possesses greater value as a paper stock than bagasse.
INSECT PESTS.

Among other things, Mr. J. B. Garrett, while working as entomologist for the station, did a very creditable work in introducing a natural enemy, the ladybird (*Cryptolaemus monroi-zieri*), to prey upon the "mealy bug" or pou-a-pouche (*Pseudococcus calceolarias*), that has infested our cane fields. It is believed that if the ladybird can successfully withstand our winters, it will eventually eradicate the pou-a-pouche.

AUDUBON SUGAR SCHOOL.

The station, as usual, co-operated with the Audubon Sugar School of the State University, and the fourth and fifth year classes were given the practical work in chemistry, agriculture, and sugar house operation during the ten weeks in which they were assigned for duty here. Year by year this course is meeting with greater appreciation, and is attracting students from many foreign countries.

PUBLICATIONS.

The following publications were issued during 1908:


Investigations on the Use of Sulphur and its Combinations in the Sugar House. By Fritz Zerban, Ph. D. Louisiana Experiment Station Bulletin 103.


CHANGES IN STAFF.

Since the last report there have been many changes in the station staff. Mr. R. E. Blouin, formerly assistant director in charge, has resigned to accept a position to establish and direct a sugar experiment station in Tucuman, Argentine Republic. Dr. Fritz Zerban, formerly research chemist, has left to assume the directorship of the "Estacion Experimental" of Peru. He has been succeeded by Dr. P. A. Yoder, formerly of the Utah Experiment Station. Mr. W. P. Naquin has resigned, and now occupies the position of chemist for the Olaa Sugar Company of Hawaii. Messrs. A. B. Joffrion and P. H. Doherty have both given up their positions as chemists here to take up similar work for the Cuban-American Sugar Company. These vacancies in the force have been filled by Mr. R. E. Graham, a State University graduate, and Mr. W. G. Taggart, who was transferred to us from the Baton Rouge Station. The force has also been increased by the addition of a bacteriologist, Mr. W. L. Owen, formerly of the Georgia Experiment Station. A discussion of this new bacteriological department is given in a separate report by Mr. Owen. The work of the chemical laboratory is also presented in a separate report by Dr. Yoder.

Very respectfully submitted,

H. P. Agee,
Assistant Director in Charge.

Sugar Experiment Station, Audubon Park,
New Orleans, La., Jan. 7. 1909.

W. R. Dodson, Director,
Baton Rouge, La.

Dear Sir—

Per your request, I submit herewith a report of the Department of Chemistry of the Sugar Experiment Station of the Louisiana State University and A. and M. College for the year 1908.

The work of this department was continued during the first half of the year along the line of methods of clarification of cane juice, on the occurrence of sulphur in molasses, and
on organic acids in cane. The bulletin on the use of sulphur and its combinations in the sugar house was finished in this part of the year. Incidentally, some work was undertaken on the methods of determining the reducing sugars. Of miscellaneous analyses from outside sources, fifty-nine samples were analyzed and reported. During the latter half of the year the work was more or less interrupted because of changes in the staff, which are being noted in another report from this station. Some new lines of experiment were started in determining some of the rarer constituents of the cane juice and sugar house products, which may have important influences on the extraction of the sucrose and upon the appearance and taste of the products. In the beginning of this work it was noted that the methods usually applied for the determination of some of these constituents, especially the organic acids, have been worked out for the examination primarily of alcoholic fermentation products, and need variation to adapt them to the analyses of sugar cane products. Work on these methods of analysis is now in progress.

The usual chemical control work was carried out during the grinding season, and samples from the mill representing the products from the sugar house were obtained and reserved for future reference or investigation. Many analyses were made in connection with the variety tests of ordinary and seedling canes. In connection with the work of the bacteriologist, the chemical department has been called upon to make a number of analyses. It is proposed to continue work on some of the rarer constituents of the cane and its products, and to furnish the necessary chemical control in the bacteriological investigations which suggest themselves from time to time, and for which the necessary material and apparatus are available.

The main laboratory received a general overhauling and much-needed improvements were made in the appearance of that room. This work should be extended to other rooms of the department as soon as time and available means permit.

Respectfully submitted,

P. A. Yoder, Chemist.
Sugar Experiment Station,
New Orleans, La., January 7, 1909.

W. R. Dodson, Director,
Baton Rouge, La.

Sir—

I have the honor to submit the following report from the Department of Bacteriology:

Since the creation of this department in July, 1908, and the subsequent completion of its laboratory equipment in August, the work conducted has been largely of a general rather than of a specific nature. The plans for the work, however, have contemplated the investigation of the inversion of sugars by bacteria, and such preliminary work as has been conducted has been with this view. Through the courtesy of the authorities of the New Orleans Sugar Exchange and the sugar interests of the State, a great variety of sugar products have been furnished for study, from which have been isolated many species of organisms that are now being studied experimentally in the laboratory. Several species isolated from these sources, and which are now being grown in pure cultures, have shown marked inverting power when introduced into cane juices and sugar crystals; others are proving of great interest on account of other detrimental changes that they effect in these products.

The work in general has comprised three lines of experimentation, viz:

(1) The study of the bacterial flora of sugar products.
(2) The determination of the factors that predispose to the bacterial inversion of these products.
(3) The extent of the occurrence of the inverting type of bacteria throughout the sugar houses of the State.

The results so far obtained are of great interest, and it is of especial significance, even at this stage of the work, to note the uniform prevalency of certain species in all of the products so far studied. A large number of specially selected samples of sugar products are kept under observation in the laboratory, chemical and bacteriological analyses of which are made at definite intervals in order to associate the changes in their chemical
composition with qualitative or quantitative changes in their bacterial content. In this way much helpful data are being secured and it is hoped that certain deductions of wide application may be made therefrom.

Efforts are being made to secure additional material for study from different parts of the world, and judging from present indications the available material will be greatly increased in the near future.

Very respectfully submitted,

WM. L. OWEN, Bacteriologist.

STATION NUMBER TWO.

State Station, Baton Rouge, Louisiana.

The office of the Director is maintained at Baton Rouge, in the Experiment Station building, on the University campus. The laboratory for analysis of feed stuffs and fertilizers for the State Board of Agriculture is maintained at the Baton Rouge Station. All the publications are issued from this station.

Mr. S. E. McClendon, Assistant Director, has remained in charge of experiments on the farm. The following is a summary of his report:

Farm Department.

The work on the Experiment Station farm has been continued along the same lines indicated in the last annual report. Most of the investigations carried on here required an extended period of years to secure reliable data on the subjects under investigation. The season has been very good for most crops, but quite disastrous to the cotton crop, which suffered great loss from excessive rains in July and August.

COTTON.

Owing to the fact that the boll weevil is forcing the planting of early varieties of cotton, there are a great many new varieties being put on the market, claiming special merit in this respect. Many of these have been grown in our variety
plats, where their merits can be thoroughly tested and com-
pared. The varieties introduced from foreign countries for
breeding purposes have shown that they are able to adapt them-
selves to the new conditions, and this year have grown a much
smaller stalk while producing an earlier crop, as well as an
increased yield. The varieties have also been tested for their
resistance to the *wilt disease*, which is becoming more widely
distributed each year. The tests of commercial fertilizers used
alone and in combinations has been continued with variable
results.

**CORN.**

There was a very good crop of corn produced the past year,
but the storms in July and August vitiated the results of a num-
ber of experiments.

The usual variety of fertilizer tests were made. The results
show again the superiority of the strains of southern origin.

The Williamson method of planting, cultivation and fertili-
ization of corn was inaugurated this year, and will be continued
until definite results are secured. Our work this year would
indicate that it was the extra fertilizers used that produced the
corn, rather than the method of planting and cultivation.

**OATS.**

We continued planting the different varieties of oats, none
of which have been able to successfully compete with the home-
grown seed. The rains in May this year delayed the harvest
several weeks, and at the same time damaged the crop about one-

The many usages to which an oat crop can be put, with
the crops that follow, thereby securing two crops per year from
the same land, should commend it to the farmers as a profitable
crop to grow. From experiments conducted at the station for
several years, there has been no pasture crop grown that would
produce the winter grazing that can be secured by the planting
of good southern-grown oats.

**FIBER CROPS.**

We have maintained small plats of ramie, jute, hemp and
flax. Ramie and jute both grow well. As a result of a test made
on the decorticating machine, by the Schlichten Ramie Com-
pany of Philadelphia, we are more encouraged than we have ever been before to hope that a machine will be perfected for decorticating this fiber. We also sent a couple of hundred pounds of ramie to a firm in St. Louis, who claim to have successfully separated the fiber in an entirely satisfactory manner, and this company is at the present time making arrangements to erect a factory in the Red river valley for the manufacture of ramie products.

We have sent out to a number of parties in the State enough ramie roots to make thorough tests of the adaptability of the plant to some of the leading soil types on which it has not been previously thoroughly tested. While the manufacturers of the decorticating machine feel confident that they have overcome the difficulties in the way of working the ramie fiber satisfactorily, they have not yet fully demonstrated this fact to the satisfaction of the station. If they have been as successful as they claim, ramie may become an important fiber crop in some of the territory where the boll weevil has been so disastrous.

FORAGE CROPS.

The usual number of forage crops have been grown. Of the new plants grown, "Guinea grass" seems to be quite promising for the wet or overflow lands of the southern part of the State. This year the grass was not injured after being covered with water for six weeks.

After selecting soy beans for four years, we have several varieties that are quite promising, this year producing profitable crops of beans. Experiments have been planned to secure additional information on this crop.

Of the many clovers, grasses, etc., tried at this station for hay, we have found nothing that combines the many good qualities of lespedeza, and at the same time producing the same quantity. This year we cut as much as 3.4 tons of well-cured lespedeza hay per acre.

ROOT CROPS.

A number of root crops have been successfully grown, producing a large quantity of feed during the winter months, when feed is most needed, and at the same time occupying the land after and between other field crops. During the past year we have tested the value of stock beets and sweet potatoes as
hog feed, the results of which were entirely satisfactory, and will be published in the near future.

STOCK BREEDING AND RAISING.

A great deal of attention has been given to the breeding and raising of live stock. During the past year, we have sold a number of cattle for breeding purposes, all of which have given satisfaction. The registered Angus and Hereford cattle bought two years ago have developed into nice animals, and attract quite a bit of attention from visitors. The get of the bulls are of marked superiority.

SHEEP.

The work of breeding up a bunch of sheep has progressed satisfactorily. During the past year we tested the practicability of feeding sheep salt and tobacco as a preventive measure against internal parasites. This was not as successful as we had hoped for, yet some beneficial results were secured. This year and next we hope to demonstrate that lambs can be successfully and profitably grown for the early market.

HOGS.

Hogs have been used in testing the value of the different grazing and root crops. This fall the demand for hogs for breeding purposes has been unusually heavy, and our best pigs have been sold for this purpose. There has been added to our herd a pair of Tamworth pigs, which is a representative of the bacon hogs.

SILO.

This is the third year we have used ensilage as a food, with good results. It has been demonstrated without a doubt that silos are as satisfactory and practical here as in the North and should be more generally used.

STEER FEEDING EXPERIMENTS.

We have carried on during the past year more extensive feeding experiments than previously undertaken. The results of this work are about ready for publication, and will be issued in bulletin form in the very near future. The results have again indicated the practicability of fattening cattle profitably, using our home-raised feeds extensively.
Department of Animal Pathology.

W. R. DoDSON, Director,
Baton Rouge, La.

Dear Sir—

The principal pathological work of the department during the past year was conducted by Dr. H. J. Milks, late assistant veterinarian and bacteriologist of the station, whose entire time was devoted to research in connection with animal diseases, especially of a bacterial nature.

As indicated in the last report, investigations have been conducted with the view of obtaining more accurate data concerning "cerebro-spinal meningitis," or so-called "blind staggerers," in horses; certain features with regard to the immunization of animals against anthrax or charbon, and to determine the potency, or otherwise, of commercial vaccines on the market. Also, to discover, if possible, the casual factor or factors, producing certain fatal diseases of chickens.

A report of the results of each investigation has been issued in bulletin form and distributed to the public. This department has, during the year, been requested and has made many bacteriological diagnoses of material sent in, especially in cases of suspected anthrax, tuberculosis, glanders, hog cholera, etc. Two, or perhaps three, outbreaks of specific hog cholera occurred in the state during the year, which were investigated by the department and traced to the importation, from other States, of hogs for breeding purposes. So far as I am aware, the infection did not spread from the original foci, as no other authentic cases have been reported from other sections of the State.

At the invitation of Dr. A. D. Melvin, Chief of the National Bureau of Animal Industry, I represented the Experiment Stations at a "hog cholera" conference, in July, at Ames, Iowa, where the government farm is located, on which representatives have been experimenting for several years to obtain a vaccine that would protect hogs against the cholera. They consider that they have at last met with success, and it was to permit representatives of the different States to become familiar
with the technique of the work and be able to prepare the vaccine at home to meet home requirements that the invitation was extended. The preparation of the vaccine is quite expensive, as it requires a plant especially arranged for the work and the destruction of quite a number of animals. It is questionable whether the limited amount, if any, of the infection at present existing in the State would warrant the erection and running of a plant at the present time. Should the necessity arise in the future, however, no doubt the preparation of this vaccine will be undertaken by the station.

During the fall, I presided at the forty-fifth annual meeting of the American Veterinary Medical Association at Philadelphia, and subsequently was in attendance at the twelfth annual meeting of the Interstate Association of Live Stock Sanitary Boards, at Washington, D. C., where I had the honor of election to the presidency for the ensuing year. At each of the meetings I represented the Experiment Stations.

Owing to my position of professor of veterinary science in the Louisiana State University, as well as veterinarian to the stations, a great part of my time has been taken up with class work during the session of the University. At the same time, however, I have been able to devote a considerable portion of time to veterinary and animal husbandry work at the station, and have conducted all, or nearly all, of the correspondence in connection with both departments, which is largely on the increase from year to year.

This department, in co-operation with Mr. J. G. Lee, Jr., who is in charge of the work, and the chemical department of the station, has inaugurated a series of experiments to obtain the digestion coefficients of several of our stock feed materials that have not been hitherto accurately ascertained. As soon as the experiments are completed, the results will be made public in bulletin form.

The department has in course of preparation a bulletin on the subject of stock feeding, which will be published soon, to take the place of No. 86, which is almost exhausted on account of the extensive demand made for it.

Dr. Milks, assistant in the veterinary department of the station, resigned during the year to take up private practice in his native state, New York.

Respectfully,

W. H. Dalrymple.
Dairy Work and Feeding Experiments at Hammond, Louisiana.

W. R. Dodson, Director,
Baton Rouge, La.

Dear Sir—

During the year the Experiment Station, in co-operation with the Dairy Division, National Bureau of Animal Industry, has conducted some very interesting experiments in feeding "blackstrap" molasses to young calves as a supplement to skim milk, the results of which have been published as Experiment Station Bulletin No. 104. It might be well to state that the results show very conclusively that "blackstrap" cannot be used as a supplement to skim milk in calf feeding. This bulletin has served to answer many inquiries in regard to the feeding of molasses to young calves.

A feeding experiment was conducted to test the value of cold pressed cotton seed cake as a feed for dairy cows, the results of which have been published as Experiment Station Bulletin No. 110, and contains some valuable data. Such gratifying results were obtained in milk production while performing this experiment, an ideal balanced ration being fed, that the writer was besieged with inquiries regarding balanced rations. This particular phase of the work has been encouraged as much as possible.

The Experiment Station also took up the work of growing feeds in co-operation with Mr. E. Consterdine & Bro., these gentlemen being leaders in the dairy industry in the Hammond vicinity. Very satisfactory results have been obtained, particular attention being given to the growing of root and leguminous crops. Mangel wortzels produced 22 tons to the acre and sweet potatoes produced 200 bushels per acre with 12 tons of vines, which have proved to be very valuable for soiling purposes. By growing a large amount of his feed stuff on the farm, Mr. Consterdine has reduced the cost of feed at least 50 per cent. It is to be hoped that other dairymen will follow the example and grow more feed, thereby increasing the net income from the dairy.
The record work has been kept up for the year, and has proved to be an excellent way of gaining knowledge of each individual animal in the herd, and has also served to promote a more systematic form of feeding and breeding, thus bringing the herd up to a better standard.

Very respectfully,
J. G. Lee, Jr.,
In Charge of Feeding Experiments.

Department of Plant Pathology.

W. R. Dodson, Director,
Baton Rouge, La.

Dear Sir—

During the past year the work in the Department of Plant Pathology has been almost entirely of a research nature. Several of the important diseases of the plants of the State are being investigated carefully and notes on others as to their occurrence, severity, etc., are being taken. On account of the warm, humid climate of the State and the mild winters, plant diseases are especially abundant. We have no way of estimating the annual loss to the State from these troubles, but it must be enormous. The climatic conditions are especially favorable for the development of soil diseases, such as the various root rots and wilt diseases. It is the aim of the department to work out carefully the life history of the disease causing organisms, the effect on the host plants, and the methods of control as far as possible.

At the beginning of the year, Mr. H. R. Fulton was in charge of the department, but he severed his connection with the station on February 1, 1908. Previous to his departure he published the results of his work in three bulletins as follows:

Bulletin No. 100, The Root Disease of Sugar Cane.
Bulletin No. 101, Diseases of Pepper and Beans.
Bulletin No. 105, Diseases Affecting Rice in Louisiana.

The writer took up the work where it was discontinued by Mr. Fulton. Some of the diseases on which he had been working have been investigated further, and also some other ones
which seem to be particularly important. The following is a brief outline of the work as conducted during the past season:

Bean Anthracnose.—This disease of beans, perhaps more commonly known as "rust" or "pod spot," has received a considerable portion of the available time. The diseases caused a great loss throughout the State, especially in the trucking districts. The green podded varieties have taken the place of the wax varieties in many localities on account of this trouble. New data in regard to the relation of the causative organism to various other micro-organisms has been obtained, and the results look very encouraging from the standpoint of the control of the disease.

Sclerotium Wilt Disease.—This disease, which causes a wilting and death of many plants, especially truck plants, has been studied carefully, particularly in regard to the tolerance of the fungus to various poisons, etc. The disease is common in certain portions of the State and will probably become more so as the trucking industry increases, and it is hoped that some practical means of control may be obtained.

Cotton Boll Rots.—Our knowledge of these at present is very limited, notwithstanding the fact that 10 to 20 per cent of the cotton crop is lost each year on account of them. A number of organisms are concerned in the rots and an attempt has been made to get at the exact relation of the different forms to each other and to the decay of the bolls. The occurrence of the different forms on a large number of bolls has been tabulated, the organisms have been isolated in pure culture, and some inoculation experiments have been undertaken. A better knowledge of the life history of one of the organisms, the cotton anthracnose, has been obtained in the discovery of the ascigeral stage developing naturally on the bolls in the field.

Cotton Wilt.—Work on this trouble has been confined to the breeding and growing of resistant varieties. The United States Department of Agriculture resistant cottons, "Dixie" and "Dillon," have not proved satisfactory under Louisiana conditions, especially since the arrival of the boll weevil. It is hoped that we may be able to obtain a cotton that is not only wilt resistant, but one that is early and adapted to Louisiana climate and soil.
"Rice Diseases.—The fungus diseases of rice, the "blast" and "smuts," have been investigated, though they are not a serious menace to rice growing. However, the smuts are extremely interesting from a scientific standpoint, as they do not seem to have the same life history as the smuts of other cereals, and it is hoped that more data may be obtained on them. A physiological trouble known as "sterile heads," which causes a great loss in southwestern Louisiana, has also been investigated.

Other plant diseases, including a serious alfalfa disease, and the root rot of sugar cane, have been studied as time has permitted.

Very respectfully,
C. W. Edgerton, Plant Pathologist.

ENTOMOLOGICAL WORK.
W. R. Dodson, Director,
Baton Rouge, La.

Dear Sir—

In response to your recent request, I beg to give you the following report of entomological work done by me during the past year:

For a number of years the sugar cane at the Sugar Experiment Station at Audubon Park and along the lower Mississippi river has been infested with the sugar cane mealy bug, Pseudococcus calceolariae, and it seemed to do considerable damage to the young germinating cane. In the spring of 1907 I made a study of its life history and habits and carried out experiments to ascertain whether or not it could be successfully held in check by the application of sprays, fumigation, etc. I also introduced from California a colony of ladybirds, Crypto laemus montrouzeiri, a natural enemy of this pest, and established it in the field at the Sugar Station. These ladybirds increased very rapidly and succeeded in almost completely clearing the mealy bugs from the plot of cane in which they were liberated. I also discovered a native fungus disease, which destroyed a large per cent of this pest during the rainy weather last summer.
I made several trips to the rice fields in Acadia parish and
made investigations of the damage being done to the rice by
insect pests. It was found that the Southern corn root worm,
*Diabrotica 12-punctata*, was destroying the early stands of rice
in a great many fields, and I therefore carried out experiments
to determine methods of control for this pest. It was found
that a good early flooding of the rice would kill the larvae of the
beetles and drive away the adults.

It was ascertained that some damage was caused to the
young rice by the sugar cane beetle, *Ligyrus rugiceps*, and I
made investigations looking toward its control. It was also
found that flooding would drive this pest from the field.

The water weevil, *Lissorhoptrus simplex*, was found to be
very abundant in the rice fields all during the summer, and
experiments were conducted to ascertain methods of control of
this insect. Some farmers had made a practice of drawing off
the flood water to kill the larvae and drive away the adults, but
I found that when such practices were carried out the rice suf-
fered more for the want of water and from being crowded by
the grasses than from the insects. My experiments showed that
where a sufficient quantity of water was kept on the rice that
the plant suffered less than when dry or only a small amount
of water was over the ground.

Very respectfully,

J. B. Garrett, Associate Entomologist.

Tests of Sugar House Machinery.

Baton Rouge, La., February 1, 1909.

W. R. Dodson, Director,

Baton Rouge, La.

Dear Sir—The following is a brief statement of the work
done during the past year:

This new field has been entered by the station for the pur-
pose of gathering experimental data upon the performance of
the varied machinery with which the sugar manufacturer has
to deal. It is hoped that by means of the data thus obtained
comparisons may be drawn of different types of machines as well as of modes of operation.

A report of the first work done in this line is given in Bulletin No. 107 of the station, under title of "Preliminary Tests of Sugar House Machinery." It describes and gives the results of tests to determine the power required to run a six-roller mill, a cane carrier, and two sets of centrifugals.

During the 1908-09 grinding season, experiments of a preliminary character were made at the Audubon Park sugar house to determine the steam consumption of a double effect under varying conditions of steam pressure, juice head, and vacuum; the steam consumption of a vacuum pan under varying conditions; the relative steam consumption of open pan and vacuum evaporators; the steam consumption of an open clarifier; the performance of a filter press under varying conditions of operation and the energy required to operate a nine-roller cane mill when grinding different kinds of cane. In order to measure the condensed water and get other necessary data, additional apparatus, such as traps, gauge glasses, etc., were purchased.

Much of the work just described was of such a preliminary character that the data gathered will not be reported, though other portions will be included in a forthcoming bulletin.

The more important work in this line is that done this session in sugar factories of Louisiana and Cuba, for the purpose of gathering data upon the performance, under varying conditions of operation, of the different types of furnaces for burning bagasse. The expense for fuel is one of the largest in the sugar house, amounting from $4,000 to $20,000 per season for a house of 1,000 tons capacity per 24 hours. The question of the form of furnace and its mode of operation for the best utilization of the bagasse as a fuel is evidently, therefore, of great importance; and, with this in view, observations were made and data gathered upon some thirty furnaces in Louisiana and twelve in Cuba by a corps of trained men.

The furnaces tested represent a wide variety of types and the observations were such as would facilitate comparisons as to grate furnace; ratio of heating surface to grate surface; form and dimensions of furnace; furnace temperature; stack
temperature; weight, moisture and calorific value of the bagasse; quality of the flue gases; draft in furnace and stack; quantity of air supplied, etc. The results of this series of investigations will be given in a forthcoming bulletin.

Respectfully,
E. W. Kerr,
Professor of Mechanical Engineering, Louisiana State University.

RICE EXPERIMENTS.

Experiments at Crowley have been continued in co-operation with the National Department of Agriculture. The work covers an extensive series of tests of the influence on yield and quality of grain by nitrogen, phosphoric acid and potash and the various combinations of these fertilizing ingredients; a further study of the large number of varieties of rice secured from the various rice-growing countries of the world, and investigations along the lines of injurious insects and parasitic diseases, as mentioned elsewhere in this report. Considerable valuable data has been obtained, but on account of lack of funds to put into this work the experiments have not been as extensive or as exhaustive as the importance of the work justifies.

The last Legislature authorized the State Board of Agriculture to establish a regular rice substation, but no appropriation was made for carrying this act into effect, and it does not appear that the rice planters are yet ready to meet all the expense of establishing and equipping an experiment station. The importance of the rice crop of the State, the decreasing yield per acre, the increasing ravages of insect and fungus pests, the growing demand for investigation of many problems that influence the profits of rice production, make it imperative that we should heed the requests of the rice growers for a rice experiment station. It is sincerely hoped that means may be found for establishing the station before the next meeting of the Legislature, and that they will make provision for its maintenance.

CORN CLUBS.

In co-operation with Col. Chas. Schuler, Commissioner of Agriculture, a number of corn clubs were established among
the schoolboys of the State. The boys were furnished with enough good corn seed to plant a half acre. The Commissioner furnished the seed and the Director of the Station aided the teachers and parish superintendents in the organization of the clubs, and a study of the best methods of corn production. Prizes were offered by the Commissioner of Agriculture, the Director of the Stations, the parish fairs and the State fair for the best exhibits and the best acreage production. Although the past season was unfavorable for corn, the boy winning the first prize gathered twenty-seven and a half bushels from a half acre of land. About forty boys sent exhibits to the State fair. Much interest was manifested in the work, and I am confident a great deal of good has been accomplished. Prof. V. L. Roy, Superintendent of Avoyelles parish, has been the most active worker in this enterprise. He thinks the work has been worth many thousands of dollars to the farmers of Avoyelles. We offered to purchase the crop of some of the prize winners at two dollars per bushel, wishing to use this corn to distribute to new clubs the coming year. We found that the entire output of the prize winners had been engaged by local farmers and we were not able to purchase any of it.

There are great possibilities for this work, and everything possible should be done to encourage it.

Horticultural Work.

The horticultural work has been continued along lines previously reported. During the year Bulletin No. 112 was published, giving the most important facts brought out by the orchard experiments for a long series of years. The work along the lines of variety and fertilizer tests with fruits and vegetables will be discontinued, and new work undertaken.

PECAN ORCHARD.

The station has arranged with Mr. N. S. Dougherty for growing a pecan orchard, in which twelve of the leading varieties of pecans have been planted, about a mile and a quarter north of the University grounds. The station furnished the trees and put them out. Mr. Dougherty has agreed to take care of the orchard and maintain it as a pecan orchard, giving the
station an opportunity to carry on any desired investigations, but the fruit of the orchard will belong to Mr. Dougherty.

The great interest being manifested in pecan growing brings many inquiries to the station on this subject, and it is reasonable to expect great developments in the industry.

HOT HOUSE.

During the fall and winter a hot house has been constructed on the northern limits of the University grounds, at a cost of approximately six thousand dollars, including all expenses. The structure is of iron frame, and modern in every respect. The tables are of indestructible material and cement walks are laid between the tables throughout. The east wing is divided into three compartments for the use of the entomologist, plant pathologist, and a room for special propagation work. Owing to delay in shipment of material and in construction work, we will not be able to make full use of the house until next winter, as it is now too late to begin extensive work for this winter. This building will add greatly to the facilities for carrying on work of special interest to those engaged in the production of early vegetables and green house products, as well as giving increased facilities for studying insect life and fungus diseases.

TICK ERADICATION WORK.

In the effort to eradicate the cattle tick from two parishes in North Louisiana, the Experiment Station has contributed the services of one man for about six months of the year, the remainder of the work being carried by the State Crop Pest Commission, and the federal government. It is hoped that the day is not far distant when the farmers generally will come to a realization of the possibility of controlling this pest. The previous work of this station, in working out the life history of the tick, and means of exterminating it, has made it easily possible to control the tick, and the disease it conveys, wherever the cattle can be confined for a comparatively short time by fences.

EXHIBITS AT THE STATE FAIR.

Again the station made exhibits at Shreveport at the State fair. We are indebted to Mr. R. Glenk, curator of the State Museum, for valuable services in arranging the exhibits in an
attractive manner, and for his aid in many other ways. The exhibit attracted attention and many favorable comments were received. We had the most instructive exhibit we have yet prepared. There is no doubt of the great good accomplished by these exhibits in putting the work of the stations before the people and in stimulating an interest in, and developing a more extensive appreciation of, the work being done by the experiment stations.

INSTITUTES, PUBLIC LECTURES, ETC.

The Director of the Stations visited most of the summer normal schools during the past summer and gave lectures to the teachers on teaching agriculture in the public schools. A great deal of interest is being taken in this subject by the teachers and by the parish superintendents, and it is confidently believed that we will soon be doing much effective work in this line. Some good work is now being done in a few of the schools. The Director has also given a number of lectures to farmers' organizations. Ten institutes, under the auspices of the State Board of Agriculture were held by Mr. Garrett of this station, Mr. Rosenfeld of the Crop Pest Commission, and Mr. Bland employed by the Commissioner of Agriculture.

The station has been represented at a number of the most important conferences and conventions of national organizations, and has had a full share of the official honors and responsibilities of these associations. It is gratifying to all loyal Louisianians to know that our own experiment station is looked upon as a leader in the lines of investigation that are of paramount interest to southern agriculture.

BUILDING AND EQUIPMENT.

The frame building now occupied by the office and laboratories of the experiment station has become so crowded as to hamper the work. The growth and importance of the work justify better facilities, and more room is imperative. The danger of fire is imminent in a frame building so large, and where, of necessity, so many gas burners are almost constantly in use. Should a fire occur, it is hardly probable that the greater portion even of valuable records, vouchers and books could be saved. There is not even a fire-proof vault on the grounds in which valuable records can be stored.
The work of the Agricultural College is scattered in several buildings, where classrooms are small and poorly lighted. It is sincerely hoped that the next Legislature may find means of providing an agricultural building, in which may be housed all of the several agricultural branches of the college, with the offices and laboratories of the Experiment Stations.

CHANGES IN STAFF.

The following were the changes in the staff of the Experiment Stations during 1908, some of which are noted under their respective departments:

Mr. R. E. Blouin resigned the Assistant Directorship of the Sugar Experiment Station.

Mr. Hamilton P. Agee succeeded Mr. Blouin.

Major J. G. Lee, Assistant Director of the North Louisiana Experiment Station, resigned this position in December, 1908.

Mr. J. B. Garrett was appointed as Major Lee’s successor.

Mr. H. R. Fulton, Plant Pathologist, left the Station early in the year.

Dr. C. W. Edgerton is Mr. Fulton’s successor.

Dr. H. J. Milks resigned the position of Animal Pathologist.

Dr. Fritz Zerban left the Sugar Station during the summer.

Dr. P. A. Yoder was appointed Chemist of the Sugar Station to succeed Dr. Zerban.

Mr. W. L. Owen was made Bacteriologist of the Sugar Experiment Station.

Mr. E. J. Watson returned to the North Louisiana Station and resumed the position of Horticulturist of that station.

Mr. G. L. Tiebout was appointed to the position of Horticulturist of the Baton Rouge Station.

Messrs. W. P. Naquin, P. H. Doherty, B. F. Hochenedel, R. E. Graham and A. B. Joffrion were appointed assistant chemists of the Sugar Experiment Station.

Messrs. Naquin, Doherty, Hochenedel and Joffrion resigned their positions to enter the commercial field.

Mr. W. G. Taggart was transferred from the position of assistant chemist at the Baton Rouge Station to a similar capacity at the Sugar Experiment Station.

Messrs. R. G. Fuller, W. D. Reid and R. G. Tillery were appointed assistant chemists for the Baton Rouge Station.
Mr. E. W. Kerr, M. E., Professor of Mechanical Engineering in the Louisiana State University, and Mr. E. M. Percy, a 1908 graduate of the same institution, have been added to the staff of the Stations and are conducting a series of investigations into the practices of the sugar houses of the State with particular reference to engineering problems.

**PUBLICATIONS ISSUED DURING THE YEAR 1908.**

Twentieth Annual Report.

Bulletin No. 100—The Root Disease of Sugar Cane.
Bulletin No. 101—The Diseases of Pepper and Beans.
Bulletin No. 102—Dairy Herds and Their Milk Production.
Bulletin No. 103—Sulphur and Its Combinations in the Sugar House.
Bulletin No. 104—Feeding Blackstrap Molasses to Young Calves.
Bulletin No. 105—Diseases Affecting Rice in Louisiana.
Bulletin No. 106—Cerebro-Spinal Meningitis of Horses.
Bulletin No. 107—Preliminary Tests of Sugar House Machinery.
Bulletin No. 110—Comparison of Cotton Seed Meal and Hulls with Cold Pressed Cake as a Dairy Feed.
Bulletin No. 111—Rotation Experiments with Cotton, Corn, Cow Peas and Oats.
Circular on the Production of Swine in Louisiana.
Circular on Peanuts.
State Geological Survey.

W. R. Dodson, Director,
Baton Rouge, La.

My Dear Sir—

The following is a report of the geological survey work conducted by me during the year 1908:

I continued work during the summer and early fall on the literature and in the field preparing a report on the oil and gas of Louisiana. I was assisted in the early fall by Messrs. Perrine and Hopper. Work has been carried on mainly in the Caddo field, though maps and reports of other fields have been checked up to date. Since November, 1903, the work has largely been carried on by funds from the United States Geological Survey. Mr. Hopper is now leaving the field and will assist in preparing the Oil Report. Dr. Maury has classified all the fossils heretofore collected in the State, mainly to assist in working out the stratigraphy of the oil regions. Mr. Hinton, paid by the Coast and Geodetic Survey, has continued tide observations at our station on Week's Island. The Report on Salt is practically completed, but we are already in debt with no funds for publishing our Oil Report.

Yours truly,
G. D. Harris, State Geologist.

Analyses of Fertilizers, Feed Stuffs and Paris Green.

W. R. Dodson, Director,
Baton Rouge, La.

Dear Sir—

In response to your request, I beg to submit the following report covering the work performed in the laboratory on the analyses of fertilizers, feed stuffs and paris green:

General Summary. 1905-06. 1906-07. 1907-08.
Fertilizer analyses made........... 1,075 1,160 2,263
Feed stuffs analyses made........... 643 1,581 3,343
Paris green analyses made........... 73 214 40
Commercial Fertilizers.

<table>
<thead>
<tr>
<th></th>
<th>1905-06</th>
<th>1906-07</th>
<th>1907-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete fertilizers</td>
<td>1,302</td>
<td>2,164</td>
<td>2,665</td>
</tr>
<tr>
<td>Fertilizers containing phosphoric acid and nitrogen, not tankages.</td>
<td>40</td>
<td>67</td>
<td>192</td>
</tr>
<tr>
<td>Fertilizers containing phosphoric acid and potash.</td>
<td>54</td>
<td>95</td>
<td>214</td>
</tr>
<tr>
<td>Acid phosphates</td>
<td>199</td>
<td>486</td>
<td>597</td>
</tr>
<tr>
<td>Bone meals.</td>
<td>123</td>
<td>206</td>
<td>288</td>
</tr>
<tr>
<td>Tankages.</td>
<td>372</td>
<td>206</td>
<td>357</td>
</tr>
<tr>
<td>Cotton seed meals.</td>
<td>328</td>
<td>864</td>
<td>764</td>
</tr>
<tr>
<td>Chemicals</td>
<td>38</td>
<td>58</td>
<td>123</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>52</td>
<td>15</td>
<td>67</td>
</tr>
<tr>
<td><strong>Total analyses</strong></td>
<td><strong>2,508</strong></td>
<td><strong>4,161</strong></td>
<td><strong>5,267</strong></td>
</tr>
</tbody>
</table>

The number of samples of fertilizers received at the laboratory the past season shows an increase over previous years, due no doubt, to the increasing number of brands put on the market. The manufacturers in most cases met their guarantees.

On account of the keen competition and the increasing cost of nitrogen, manufacturers are apt to use low-grade nitrogenous substances in compounding their fertilizers. An example of this was brought to us when a manufacturer put out a fertilizer under the name of “Foreign Imported Tankage,” which was imported from some foreign country. An examination of this material revealed the presence of wool waste, shoddy, hair and leather. The results of our investigations proved that the material was not suitable for plant food on account of its low availability. The purchaser and the manufacturer were acquainted with our findings. When the manufacturer could not dispose of this material in its original form, it was sold mixed with one of their brands of complete fertilizer. Adulteration of this kind shows the necessity for our fertilizer law and the strict enforcement of the same.

Fertilizer recipes were sold to some of our planters during the early part of this season and we exercised every energy to put a stop to this as soon as we found it out. A full report of this is given in Bulletin No. 113. A planter using such a recipe is bound to be disappointed in the results obtained, besides being deprived of his money. Frauds of this nature would no doubt be practiced extensively were it not for our fertilizer law.
PARIS GREEN.

The past season forty samples of Paris green were received and analyzed and all of them ran above the guarantee of 50 per cent arsenious oxide, as required by our law. It is a source of satisfaction to know that the Paris green shipments inspected this past season have all been of good quality. These samples average 55.85 per cent of arsenious oxide.

COMMERCIAL FEEDING STUFFS.

<table>
<thead>
<tr>
<th></th>
<th>1905-06</th>
<th>1906-07</th>
<th>1907-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton seed meal</td>
<td>588</td>
<td>749</td>
<td>823</td>
</tr>
<tr>
<td>Rice bran</td>
<td>177</td>
<td>343</td>
<td>312</td>
</tr>
<tr>
<td>Rice polish</td>
<td></td>
<td>142</td>
<td>151</td>
</tr>
<tr>
<td>Wheat products</td>
<td>74</td>
<td>1,402</td>
<td>1,705</td>
</tr>
<tr>
<td>Molasses feeds</td>
<td>330</td>
<td>442</td>
<td>861</td>
</tr>
<tr>
<td>Corn chops</td>
<td></td>
<td>2,101</td>
<td>3,134</td>
</tr>
<tr>
<td>Corn and oat feeds</td>
<td>543</td>
<td>749</td>
<td>640</td>
</tr>
<tr>
<td>Feed mixtures</td>
<td></td>
<td></td>
<td>357</td>
</tr>
<tr>
<td>Hominy feeds</td>
<td></td>
<td>42</td>
<td>55</td>
</tr>
<tr>
<td>Feed meals</td>
<td></td>
<td>65</td>
<td>68</td>
</tr>
<tr>
<td>Brewers’ grains</td>
<td>29</td>
<td>46</td>
<td>87</td>
</tr>
<tr>
<td>Poultry feeds</td>
<td>4</td>
<td>323</td>
<td>357</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>70</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Total analyses</td>
<td>1,815</td>
<td>6,469</td>
<td>8,615</td>
</tr>
</tbody>
</table>

The number of samples of feed stuffs received during the past season has been greater than ever before. There is a great deal of competition between the several manufacturers of commercial feeds and this condition has helped to bring about a general improvement in the quality of our feeds. The manufacturers are beginning not only to think of meeting the guarantee, but they are also endeavoring to put out feeds that will have a good effect on the animals to which they are fed. It is not unusual for a manufacturer to change the composition of his feed to bring about such improvement.

Since the passage and enforcement of the feed stuff law there has been a wonderful improvement in the commercial feeds sold in the State. It has necessitated the discontinuance of the sale of many inferior feeds formerly common to our market. On the whole Louisiana is now receiving better commercial feeds than most any State in the Union.
MISCELLANEOUS ANALYSES.

This laboratory is always glad to analyze soils, waters, fertilizers, feed stuffs, ores, insecticides and other materials, free of charge, when such work does not interfere with the official work. The official work includes the analyses of fertilizers, feed stuffs and Paris green collected by the official inspectors, and this work is always given preference. The past season several samples of soils, waters, ores, insecticides, feed stuffs, fertilizers, etc., were examined.

GENERAL REMARKS.

It is our aim in all of our work to get the results to the purchaser and the manufacturer as soon as possible. Our success in this is partly shown when you consider that we made 2,263 analyses of feed stuffs covering 8,615 shipments.

In the number of feed stuff analyses made, we surpass all other laboratories charged with such work.

We handle more samples of fertilizers and feed stuffs than any other laboratory in this country, and, as far as we know, we perform more work per man than any laboratory doing such work. The analyses of this laboratory are frequently used as a basis for settling disputes between commercial chemists, and it enjoys the confidence of both the planters and the manufacturers. Contracts for payment of feeds and fertilizers are frequently made on the results of our work.

A new apparatus for extracting fat has been installed and it has enabled us to do more work on feed stuffs than formerly. Other laboratory equipment has been improved, to increase the efficiency of the work.

Respectfully,

J. E. HALLIGAN,
Chemist in Charge of Feed Stuff, Fertilizer and Paris Green Laboratories.

STATION NUMBER THREE.

North Louisiana Station.

Major J. G. Lee has been in charge of the work at Calhoun during the past year. On account of poor health his resignation was tendered, to take effect the last of December, 1908, and
Mr. J. B. Garrett was appointed assistant director for this station. Major Lee's valuable services in agricultural lines are well known over the State, and it is a great misfortune to this interest to have his work interrupted. However, Major Lee is yet a young man, and we shall hope to see him grow strong and re-enter the work of advancing the agricultural development of Louisiana, as he is eminently qualified by temperament, training and experience for this work.

Mr. Garrett is a graduate of this University, has been identified with agricultural investigations of the Crop Pest Commission and of the Experiment Station for several years, and acted one year as assistant director of the Calhoun station, during the absence on leave of Major Lee. He is well qualified to take up the work there, and he has the hearty support of all who know him.

CATTLE FEEDING EXPERIMENTS.

The results of feeding experiments in which ensilage and cotton seed meal, as compared with cotton seed hulls and meal, were used for the production of beef, have been continued. Twelve steers were fed in 1907-08, and sixteen head are now ready for market. We have the results of three years' experiments about ready for publication. The practicability of keeping silage in perfect condition has been fully demonstrated.

ROTATION EXPERIMENTS.

The rotation experiments have been continued. Bulletin No. 111 gives the results of these experiments for a long series of years. These results should be of inestimable value to the farmers of the State.

COTTON.

Considerable attention has been given to testing early varieties of cotton, under boll weevil conditions, on larger areas than usually used for experiments of this kind. The early varieties all made fairly good yields, while ordinary varieties produced only about half as much. Hawkins Extra Early Prolific, Toole's and Pullnot, all produced nearly a bale per acre, on hill land. King's was somewhat inferior to the above named varieties.
The results demonstrate the possibility of raising fairly good crops, by proper cultivation, fertilization and selection of varieties, under average conditions with boll weevil infestation.

CORN.

Besides continuing variety and fertilizer tests on corn, special attention has been given to cultural methods in corn production. The Williamson method of raising corn has again been tested with results that were not very favorable to the method.

PEANUTS.

More extensive experiments have been carried on with peanuts and several new varieties were secured from the Division of Seed and Plant Introduction of the National Department of Agriculture. Plans have been consummated whereby we are to co-operate with the National Department in testing the possibility of producing peanuts on a large scale for oil production.

SUGAR CANE EXPERIMENTS.

Experiments for determining the influence of different fertilizers on the color and quality as well as quantity of syrup and sugar cane on the hill lands has been continued. This work has already resulted in securing some very valuable data, but it is considered best to secure the results of several years of verification before publishing the same. We believe, however, that by proper fertilization, the hill lands of North Louisiana of average quality can be made fairly profitable in the production of cane syrup, whereas the growing of cane has heretofore been limited almost entirely to small areas of bottom land along the branches and small streams.

STATION CATTLE.

Since the organization of the station there has been a Jersey herd of cattle kept here and a dairy has been maintained. But so much trouble has been experienced in keeping a satisfactory dairyman and the farmers seemed to take such little interest in this enterprise that it was deemed best to remove the dairy herd to the dairy of the State University at Baton Rouge, and take up some work with the beef types here. We
now have ten good grade Red Polled heifers and expect to breed them to a pure Red Polled bull and continue to improve the herd in that way.

SHEEP.

We have a nice flock of ewes, which have been bred to a pure bred Southdown ram and we will continue to grade them up until we have a first-class herd of mutton producers to work with. Sheep are easily kept and there is no reason why every farmer in this section of the State should not have a small flock on his farm to help utilize waste products and return a handsome profit for the little attention which they require. We are going to carry on several experiments during this year to ascertain the most economical methods of maintaining and rearing sheep in this section of the State, and hope to get some valuable data along that line.

HOGS.

The farmers throughout the State, and more especially in North Louisiana, are devoting more time and attention to the raising of hogs than ever before, and many of them are asking for information concerning the breeds, the best and most economical crops to grow for the production of pork, the best methods for raising and caring for pigs, and what profits may be expected if the most economical methods are employed. To get sufficient data on all of these points will require a good deal of time and work, but we have planned a number of experiments which, when completed, will furnish us with all of the necessary information along this line.

CREOSOTING EXPERIMENTS.

There has been such a great demand for all kinds of timber for the past few years that the forests have become almost depleted of the fine hardwood trees from which the best fenceposts were formerly made, and it is now necessary to find some kind of substitute to take the place of these timbers for fencing purposes. With that idea in view, this station conducted, in co-operation with the United States Department of Agriculture, Forest Service, some experiments in creosoting loblolly pine, bay, sweet gum, black gum, tupelo gum, and cypress.
The posts were cut, the bark removed and then dried before being subjected to the treatment. One thousand posts in all were treated and they were divided into several lots, each lot being treated for a different length of time, and then a label was placed on each post in order that it will be no trouble to locate them at any time. About one-half of these posts have already been set in the ground on the station, and good, substantial woven-wire fences have been erected, so with these posts and that kind of fencing we should not have much trouble with the fencing proposition in the near future.

**DAIRY WORK.**

The herd of dairy cattle which have for many years been kept at this station have been removed to the State Experiment Station, Baton Rouge, where the facilities are broader and better for all phases of dairy work which are suitable for investigation the results of which will lead to an improvement in the dairy herds of the State.

**HORTICULTURAL WORK.**

During the past season no extensive work along horticultural lines was undertaken, except to maintain the orchard and nursery stock, previously planted. During a considerable portion of the time we had no horticultural specialist on the station staff at Calhoun. Mr. E. J. Watson, former horticulturist of the station, returned, however, in August, and has since given his time to the inauguration of some new lines of work that will be prosecuted in the future. Among the experiments planned, on peaches, is a series of tests (1) for determining the influence of phosphoric acid and potash on the flavor and shipping qualities of peaches. (2) Comparison of the different methods of cultivation and summer cropping of the peach orchard. (3) Spraying for the control of fungus diseases. (4) Spraying, whereby to retard the blooming. (5) Continuation of the work of selecting seedling peach trees with a view of hybridizing for the production of special characters which we hope to be able to combine.

The work on grapes and plums will be a continuance of the work already outlined in previous reports.
We have planned some extensive experiments looking to the development of better methods of handling and preserving the early crop of potatoes and of securing better seed for planting the fall crop. The results already secured lead us to believe that a way can be found of securing much larger yields of fall potatoes than have previously been possible under ordinary conditions. We shall also have in mind the possibility of developing a strain of potatoes that will have much better keeping qualities than any of the varieties now grown.
Financial Statement.
(Receipts and disbursements of all funds.)

The following is a copy of the statement already rendered to the Federal authorities, showing the receipts and expenditures of the Hatch Fund and the Adams Fund for the year ending June 30, 1908:

HATCH AND ADAMS FUNDS.

<table>
<thead>
<tr>
<th>DR.</th>
<th>Hatch Fund</th>
<th>Adams Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To receipts</td>
<td>Hatch Fund</td>
<td>Adams Fund</td>
</tr>
<tr>
<td>from</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the Treasurer of the United States, as per appropriations for fiscal year ended June 30, 1908, under acts of Congress, approved March 2, 1887 (Hatch Fund), and of March 16, 1906 (Adams Fund),</td>
<td>$15,000.00</td>
<td>$9,000.00</td>
</tr>
<tr>
<td>Abstract.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>By Salaries</td>
<td></td>
<td>$14,982.02</td>
</tr>
<tr>
<td>Labor</td>
<td></td>
<td>99.84</td>
</tr>
<tr>
<td>Postage and stationery</td>
<td>2.98</td>
<td>1.80</td>
</tr>
<tr>
<td>Freight and express</td>
<td>54.33</td>
<td></td>
</tr>
<tr>
<td>Heat, light, water and power.</td>
<td>164.60</td>
<td></td>
</tr>
<tr>
<td>Chemical supplies</td>
<td>634.82</td>
<td></td>
</tr>
<tr>
<td>Seeds, plants and sundry supplies</td>
<td>14.80</td>
<td></td>
</tr>
<tr>
<td>Feeding stuffs</td>
<td>60.75</td>
<td></td>
</tr>
<tr>
<td>Library</td>
<td>246.56</td>
<td></td>
</tr>
<tr>
<td>Tools, implements and machinery</td>
<td>.25</td>
<td></td>
</tr>
<tr>
<td>Furniture and fixtures</td>
<td>7.00</td>
<td></td>
</tr>
<tr>
<td>Scientific apparatus</td>
<td>253.34</td>
<td></td>
</tr>
<tr>
<td>Live stock</td>
<td>100.65</td>
<td></td>
</tr>
<tr>
<td>Traveling expenses</td>
<td>263.90</td>
<td></td>
</tr>
<tr>
<td>Contingent expenses</td>
<td>15.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Buildings and land</td>
<td>42.21</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$15,000.00</td>
<td>$9,000.00</td>
</tr>
</tbody>
</table>
We, the undersigned members of the State 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 Stations of the Louisiana State University and Agricultural and Mechanical College for the fiscal year ending June 30, 1908, and have found the above classification to be correct, and the receipts for the time named are shown to be $15,000 for the Hatch Fund, and $9,000 for the Adams Fund, and the corresponding disbursements are $15,000 for the Hatch Fund and $9,000 for the Adams Fund, for all of which the proper vouchers are on file, and have been examined by us and found correct.

(Signed)

CHAS. SCHULER,
Commissioner of Agriculture and Immigration.

HENRY FUQUA,
Vice President Board of Supervisors of the Louisiana State University and Agricultural and Mechanical College, and Ex-Officio Member of the State Board of Agriculture.

The following is a combined statement of the receipts and expenditures from December 1, 1907, to November 30, 1908, of funds other than those secured through Federal appropriations, statements covering same having been reported to the State Auditor after the accounts and vouchers for the above period had been examined and found correct by Mr. Henry Fuqua, Vice President of the Board of Supervisors of the Louisiana State University:

STATE FUND.

DR.

Cash on hand, Dec. 1, 1907..............$6,460.50
Received from the State Treasurer......6,500.00
Received from the State Treasurer (through the Commissioner of Agriculture), Fertilizer and Feed Stuffs Fund. *3,000.00
Received from miscellaneous sales, etc...4,444.66
Transferred from the Fertilizer Fund...*10,500.00

Total......................................$30,905.16
<table>
<thead>
<tr>
<th>Item</th>
<th>CR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>$1,894.65</td>
</tr>
<tr>
<td>Labor</td>
<td>8,089.83</td>
</tr>
<tr>
<td>Publications</td>
<td>3,331.94</td>
</tr>
<tr>
<td>Postage and stationery</td>
<td>747.63</td>
</tr>
<tr>
<td>Freight and express</td>
<td>836.39</td>
</tr>
<tr>
<td>Heat, light and water</td>
<td>702.67</td>
</tr>
<tr>
<td>Chemical supplies</td>
<td>437.64</td>
</tr>
<tr>
<td>Seeds, plants and sundry supplies</td>
<td>1,719.13</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>413.98</td>
</tr>
<tr>
<td>Feeding stuffs</td>
<td>1,714.04</td>
</tr>
<tr>
<td>Library</td>
<td>286.72</td>
</tr>
<tr>
<td>Tools, implements and machinery</td>
<td>989.31</td>
</tr>
<tr>
<td>Furniture and fixtures</td>
<td>441.21</td>
</tr>
<tr>
<td>Scientific apparatus</td>
<td>821.99</td>
</tr>
<tr>
<td>Live stock</td>
<td>2,102.84</td>
</tr>
<tr>
<td>Traveling expenses</td>
<td>963.32</td>
</tr>
<tr>
<td>Contingent expenses</td>
<td>1,251.97</td>
</tr>
<tr>
<td>Building and repairs</td>
<td>3,210.26</td>
</tr>
<tr>
<td>Rent</td>
<td>147.50</td>
</tr>
<tr>
<td>Exhibits</td>
<td>343.16</td>
</tr>
</tbody>
</table>

**Total** $30,446.18

**Receipts** $30,905.16

---

*See Fertilizer, Feed Stuffs and Paris Green Fund Statement.*

---

**FERTILIZER, FEED STUFFS AND PARIS GREEN FUND.**

**DR.**

Cash on hand, Dec. 1, 1907..................$ 2,646.63
Received from the State Treasurer (through the Commissioner of Agriculture) .................. 31,174.80
Received from miscellaneous sources........ 146.36

**Total** ...................................... $33,967.79
<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferred to account of Experiment Stations</td>
<td></td>
</tr>
<tr>
<td>State Fund</td>
<td>*$10,500.00</td>
</tr>
<tr>
<td>Transferred to account of Experiment Station</td>
<td></td>
</tr>
<tr>
<td>State Fund</td>
<td>*$3,000.00</td>
</tr>
<tr>
<td>Salaries</td>
<td>10,850.35</td>
</tr>
<tr>
<td>Publications</td>
<td>2,573.15</td>
</tr>
<tr>
<td>Labor</td>
<td>1,121.29</td>
</tr>
<tr>
<td>Postage and stationery</td>
<td>327.14</td>
</tr>
<tr>
<td>Freight and express</td>
<td>293.49</td>
</tr>
<tr>
<td>Heat, water and light</td>
<td>64.78</td>
</tr>
<tr>
<td>Chemical supplies</td>
<td>1,197.71</td>
</tr>
<tr>
<td>Seeds, plants and sundry supplies</td>
<td>341.17</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>64.21</td>
</tr>
<tr>
<td>Feeding stuffs</td>
<td>149.01</td>
</tr>
<tr>
<td>Library</td>
<td>235.10</td>
</tr>
<tr>
<td>Tools, implements and machinery</td>
<td>272.34</td>
</tr>
<tr>
<td>Furniture and fixtures</td>
<td>174.20</td>
</tr>
<tr>
<td>Scientific apparatus</td>
<td>613.14</td>
</tr>
<tr>
<td>Live stock</td>
<td>2.00</td>
</tr>
<tr>
<td>Traveling expenses</td>
<td>488.31</td>
</tr>
<tr>
<td>Contingent expenses</td>
<td>336.60</td>
</tr>
<tr>
<td>Building and repairs</td>
<td>89.03</td>
</tr>
<tr>
<td>Exhibits</td>
<td>23.75</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$32,716.77</strong></td>
</tr>
</tbody>
</table>

**Receipts**

- Cash on hand Nov. 30, 1908: 1,251.02
- Total: 33,967.79

*See State Fund Statement. Transferred from Fertilizer, Feed Stuffs and Paris Green account, surplus after paying expenses of analytical laboratory, $13,500. This amount shows as a receipt on both Fertilizer and State Fund books, when as a matter of fact the above sum was transferred from the Fertilizer, Feed Stuffs and Paris Green account to that of the State Fund account.*
GEOLOGICAL SURVEY FUND.

DR.
Cash on hand Dec. 1, 1907.................$ 387.94
Received from the State Treasurer...... 3,000.00

Total......................................$ 3,387.94

CR.
Salaries ......................................$ 1,435.86
Labor ........................................ 5.70
Publications................................. 369.30
Postage and stationery.................... 16.52
Freight and express........................ 32.07
Seeds, plants, etc.......................... 16.35
Library ....................................... 41.09
Field expenses.............................. 743.30

Total......................................$ 2,659.39

Receipts
Cash on hand Dec. 1, 1908................. 728.55

$3,387.94  $3,387.94

Available Bulletins.

The following is a list of the available bulletins of the Experiment Stations, and requests for these publications should be addressed to the Baton Rouge Station:

Bulletin No. 5—Sugar Making on a Small Scale.
Bulletin No. 67—Broom Corn, How to Grow and Cure It.
Bulletin No. 68—Home Grown vs. Purchased Seed.
Bulletin No. 69—Pecans and Pecan Culture.
Bulletin No. 70—Cane Borer (*Diatroca Saccharalis*).
Bulletin No. 71—Report of North Louisiana Experiment Station, 1901.
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. 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 Diseases of Sheep; Bare-Lot Method of Raising Lambs.

Bulletin No. 84—Texas Fever.

Bulletin No. 85—Black Leg.

Bulletin No. 86—Our Available Stock Foods.


Bulletin No. 88—Commercial Feeding Stuffs.

Bulletin No. 89—Nodule Diseases of Intestines of Sheep; Bare-Lot Method of Raising Lambs.

Bulletin No. 90—Vegetables and Fruits.

Bulletin No. 91—Chemistry of Sugar Cane and its Products in Louisiana.


Bulletin No. 94—Effects on the Human System of Louisiana Manufactured Syrups and Molasses.

Bulletin No. 95—Diseases of Lambs and Sheep; Bare-Lot vs Grass-Lot.
Bulletin No. 96—Cotton Wilt.
Bulletin No. 98—Commercial Feeding Stuffs.
Bulletin No. 100—The Root Disease of Sugar Cane.
Bulletin No. 101—The Diseases of Pepper and Beans.
Bulletin No. 102—Dairy Herds and Their Milk Production, Hammond, La.
Bulletin No. 103—Sulphur and Its Combinations in the Sugar House.
Bulletin No. 104—Feeding Blackstrap Molasses to Young Calves.
Bulletin No. 105—Diseases Affecting Rice in Louisiana.
Bulletin No. 106—Cerebro-Spinal Meningitis of Horses.
Bulletin No. 107—Preliminary Tests of Sugar House Machinery.
Bulletin No. 110—Comparison of Cotton Seed Meal and Hulls with Cold Pressed Cake as a Dairy Feed.
Bulletin No. 112—Orchard Report of Baton Rouge Station.
Circular on Anthrax or Charbon (by Dr. W. H. Dalrymple, M. R. C. V. S.).
Circular—A Few Facts on the Production of Swine in Louisiana.