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Thirty-Second annual report of the agricultural experiment stations of the Louisiana State University and Agricultural and Mechanical College.

William Haddock Dalrymple

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THIRTY-SECOND ANNUAL REPORT

OF THE

Agricultural Experiment Stations

OF THE

Louisiana State University

AND

Agricultural and Mechanical College

FOR 1920

TO THE GOVERNOR

BY

W. H. DALRYMPLE
DIRECTOR
January 31, 1921.

To His Excellency, John M. Parker,
Governor of Louisiana.

Sir—I have the honor to submit herewith, the annual report of the Agricultural Experiment Stations of the Louisiana State University and Agricultural and Mechanical College, for the year 1920. As required by act of Congress of March 2, 1887, providing federal aid for experiment stations of the several states, and in accordance with act of March 2, 1906, providing additional federal funds for research work at the experiment stations of the several states, a financial statement is appended, for the year beginning July 1, 1919 and ending June 30, 1920.

Respectfully,

W. H. Dalrymple,
Director.
Louisiana State University and Agricultural and Mechanical College

Louisiana State Board of Agriculture and Immigration

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EXPERIMENT STATION STAFF

W. H. DALRYMPLE, M. R. C. V. S., Director.
W. C. TAGGART, B. S., Asst. Director, Sugar Sta., New Orleans.
A. F. KIDDER, B. S., Assistant Director and Agronomist, Baton Rouge.
G. D. CAIN, B. S., Asst. Director, North La. Experiment Station, Calhoun.
J. MITCHELL JENKINS, B. S., Asst. Director, Rice Station, Crowley.
C. W. EDGERTON, Ph. D., Plant Pathologist, Baton Rouge.
H. MORRIS, D. V. M., Bacteriologist and Veterinarian, Baton Rouge.
T. H. JONES, B. S., Entomologist, Baton Rouge.
W. G. BRADLEY, Assistant Entomologist, Baton Rouge.
G. L. TIEBOUT, B. S., Horticulturist, Baton Rouge.
A. P. KERR, M. S., Chief Chemist, Baton Rouge.
W. P. DENSON, B. S., Assistant Chemist, Baton Rouge.
J. H. JOLLY, B. S., Assistant Chemist, Baton Rouge.
A. D. LIPSCOMB, B. S., Assistant Chemist, Baton Rouge.
E. C. THOMAS, M. S., Assistant Chemist, Baton Rouge.
C. R. HUMMEL, B. S., Assistant to Chief Chemist, Baton Rouge.
W. G. RAINES, Assistant Research Chemist, New Orleans.
R. C. CALLOWAY, B. S., Manager of Dairy, Baton Rouge.
A. A. ORMSBY, Specialist in Fair Exhibits, Baton Rouge.
MRS. RUTH HEIDELBERG, Secretary, Baton Rouge.
MRS. HELEN HARDY, Mailing Secretary, Baton Rouge.
J. K. McHUGH, Stenographer, New Orleans.
E. K. BREEDEN, Farm Manager, State Station, Baton Rouge.
SIDNEY STEWART, Farm Manager, North La. Station, Calhoun.
On December 31, 1919, the Experiment Stations had the misfortune to lose the valuable service of Prof. W. R. Dodson, who had been Director of the Stations since 1905. The severance of Professor Dodson's relations with the organization was a distinct loss to the work, and to the agricultural interests of the State generally, as, besides his knowledge and ability concerning matters agricultural, he was always ready and anxious to assist in pushing forward any project which had for its object the betterment of our agricultural people, whether social or material.

The administration of the work of the Stations has been under the direction of the present incumbent of the office, who is also Dean of the College of Agriculture of the University, since January 1, 1920, when he was appointed to succeed the former Director.

Owing to conditions subsequent to the late World War, the expenses of the organization have been very much increased during the past year, in salaries, in labor, and in the cost of necessary materials. However, the General Assembly, at its last regular session, in order to meet increased expenditures, including repairs to Station property, etc., was generous enough to raise the State appropriation for the several stations, $25,500 per annum, for the biennial period.

**PROPOSED TRUCK AND FRUIT STATION.**

A delegation from Tangipahoa Parish, headed by Mr. H. P. Mitchell, President of the Police Jury, appeared before the Committee on Agriculture of the House of Representatives, at the last meeting of the Legislature, and stated that they had passed an ordinance setting aside one-eighth of a mill out of the revenues of the Parish, for ten years, to provide a site and buildings for a Truck and Fruit Station in that Parish.

At the solicitation of this delegation, and upon the recommendation of the Station authorities and the State Commissioner of Agriculture, a bill, authorizing the establishment of such a station in the Florida Parishes, was passed by the Legislature.

Soon after the passage of this bill, a representative of the Stations appeared before the Police Jury of Tangipahoa Parish,
requesting that the necessary steps be taken to purchase the property, which was to have been selected by a committee representing the State.

In December, an ordinance was passed to make the sum of $20,000 available through the issuance of certificates of indebtedness. Subsequently, however, with a change in personnel of the Police Jury, both of the ordinances referred to were repealed, much to the disappointment of many of the prominent people of the section.

But while this unfortunate action of the Police Jury of Tangipahoa Parish will, necessarily, delay the locating of a station in that particular section, work in truck and fruit investigations will be extended and advanced at the State Station for the time-being, at least, so that this important branch may not be permitted to suffer.

**IBERIA LIVE-STOCK EXPERIMENT FARM**

The present Director has, at the request of United States Secretary of Agriculture Meredith, succeeded the former Director, as a member of a committee to supervise the operations on the Iberia Live-Stock Experiment Farm at Jeanerette, La., in which the State is cooperating with the Federal Government. Reports have, from time to time, been received at this office from the Specialist in charge of the Farm, showing some excellent work accomplished, the results of which should be extremely useful to us from an experimental point of view, and which have been published, in epitomized form in a Report of the Operations of the Bureau of Animal Industry, for the fiscal year ending June 30, 1920, under the heading, "Activities Receiving Special Attention."

**SUGAR EXPERIMENT STATION**

We have been notified by the Audubon Park Commission, New Orleans, that our Sugar Experiment Station must be moved from its present site by March, 1922.

In order to retain the Station on suitable land in the vicinity of New Orleans, the Louisiana Sugar Planters' Association has purchased, and proposes to deed to the Board of Supervisors, of
the Louisiana State University and Agricultural and Mechanical College, a tract of land, about thirty acres, close to Harahan, on which to locate the Station.

Preliminary work will be commenced on the new property as early as possible, so as to get the land in order for planting operations; and other matters, looking toward removal, will be attended to, so far as present Stations funds will permit. It is hoped, however, that sufficient funds will be forthcoming to place this Station on a permanent basis, and with equipment commensurate with the great agricultural industry it represents in Louisiana.

Since the death of Dr. F. V. Emerson, the Station has not been able to secure the services of a suitable person to take charge of the Geological Department; and the position of Soil Chemist has been vacant since the resignation of Mr. S. S. Walker. It is hoped, however, that both of these important positions may be filled in the near future.

Cooperating with the University, the Extension Department, and the State Department of Agriculture, the Stations employed an expert on exhibits, whose report appears in another part of this report. The result of this officer’s work has been very evident in the much better display of our exhibits at the State and other fairs, including a special exhibit of our agricultural products at the Grain and Hay Show, in connection with the International Live Stock Exposition, at Chicago, in 1920. The consensus of opinion seems to have been that the Louisiana exhibit attracted more attention and created more favorable comment than any other similar display at the show.

STATION NO. 1

Sugar Experiment Station, Audubon Park, New Orleans.
W. G. Taggart, Asst. Director, in Charge.

SUGAR CANE WORK.

The year 1920 was in many respects similar to that of 1919. The difficulties, if anything, were more numerous and more obdurate. Labor was slightly more plentiful, but could be obtained only at such heavy cost as to make it almost prohibitive to this
Station. In fact, the funds at the Station’s disposal were barely sufficient to support two aged negroes during the spring and summer months. As a result of this condition, in order to give all the time to the more important plats of cane, it was necessary to abandon some of the experimental work that had been started.

Tremendous inroads were made on the Station Staff. In fact, the entire laboratory staff from both chemical and bacteriological departments resigned to accept more lucrative positions elsewhere. The executive department has made diligent search for men to replace those who left, and even sent a representative to the East and Middle West for the purpose, but to date, no one considered competent has been found, who would become interested in the salary offered. Temporary arrangements were made to carry on the work of these departments. Two able persons, one a chemist and the other a bacteriologist, were assigned to duty by the courtesy of the Bureau of Chemistry of the United States Department of Agriculture, and this arrangement has enabled us to continue, during the grinding season, the most important studies that were under consideration. These temporary aids will shortly be recalled to Washington and we are still without a chemical staff.

The yields of sugar cane per acre were poor, and were to a large extent, a reflection of the labor troubles already mentioned. However, comparatively the results were good, and some very valuable data were secured. Fertilizer experiments conducted with nitrogenous materials showed the usual progress, and somewhat better contrasts between fertilized and unfertilized canes were obtained. The increased yields due to the standard ration of 36 pounds nitrogen, varied from 49.6 to 91.7 per cent when first year stubble was under consideration, and from 21.1 to 48.5 per cent in the case of plant cane. Ammonium nitrate again caused the greatest increase in tonnage, and it was followed by cotton-seed meal and calcium cyanamid. Tankage followed its precedent of the past six or eight years by yielding the lesser return. This last mentioned fact is, of course, to be expected, when we consider that the livestock industry has made such heavy demands for blood and beef scraps. While at an earlier date slaughter-house refuse carried with it much scraps and dried blood that
found its way to the fertilizer factory, today, only such of that material goes to fertilizer as cannot be used otherwise. The usual good results were obtained from our experiments with phosphoric acid. That mixture carrying 72 pounds of available phosphoric acid with its ration of nitrogen gave an increase of 131.5 per cent, while one with 36 pounds of phosphoric acid and an equivalent ration of nitrogen gave only 26.6 per cent increase.

The work with clover used as a winter and early spring crop, with a slight deviation, was continued. On account of some suggestions from sugar planters, to the effect that the cost of hoeing was severe, where clover had been grown on fall planted cane, the Station tried to devise a means of obviating the objection. A sharp stubble shaver was used to remove the growing clover from the ridge over the planted cane. While this implement can be used satisfactorily, so far as the removal of the clover is concerned, it should never be done late. Cane so treated was so severely set back by the shaving that it never fully recovered. The beneficial effect of the clover on the physical condition of the soil was apparent throughout the season, and a slightly increased yield of sugar cane was obtained from the plat which had been planted to sweet clover, but not nearly so great an increase as has been obtained during the last few years.

Crimson clover is not so well suited to this use as sweet clover. It is encouraging to note that this work has been adopted by the sugar planters. One planter bought a carload of sweet clover seed for the use of himself and neighbors.

No new varieties of sugar cane were obtained during the year, and all variety work was done with those already on hand. L-511 continued its good record here. The juice from that cane contained 14.75 per cent sucrose as compared with 12 per cent for D-74 and 11.75 per cent for Purple. L-511 also shows marked resistance to the Mosaic disease of sugar cane. By selection, progress was made toward obtaining at least a Mosaic-resistant strain of that cane. Selection of resistant cane of other varieties was begun at the time of the last planting. All seedlings that show resistance are being especially watched, and the possibility of good results is at least hopeful.
Work with seed cane dipped in bichloride of mercury solution was continued. An increased yield was obtained from Louisiana Purple cane treated in this way, but contrary to the results of 1919, lesser yields were secured from L-511. This is an example of the annual variables met with in experimental work, and illustrates the necessity of continued diligence to produce reliable data.

On account of the lack of labor and the unfavorable weather those experiments which were continued on corn, clover, alfalfa and other such crops, had to be abandoned.

RESEARCH CHEMICAL DEPARTMENT.

The chemical department, under the able direction of Dr. F. W. Zerban, finished a masterly piece of work which has been published as Louisiana Bulletin No. 173. This work embodies a close study of the coloring matters of sugar cane and sugar-cane products, together with the effect of chemical as well as mechanical clarification on them and on other solids not sugar contained in sugar cane juice. The demand for Bulletin No. 173 is very heavy and reflects the appreciation of the sugar public for the work. Further investigation along this same line, but using four activated carbons in the sugar house, instead of one, is being continued by Dr. J. F. Brewster.

DEPARTMENT OF BACTERIOLOGY.

The bacteriological department under Dr. Nicholas Kopeloff completed some valuable work on the effects of molds and mold spores on sugars in storage, and the results have been published as Bulletins Nos. 170 and 175. This work points out the possibility of molds and mold spores through the secreted enzyme destroying sugar in the process of manufacture and in storage. Also methods of preventing such loss are established. Especially interesting is the effect of superheated steam when applied to sugars in a centrifugal. This use of steam is easily applicable to any sugar house, and the information as to means of applying it and the results caused thereby have been the subject of many letters addressed to this Station during the past few months. Fur-
ther data on the factor of safety to be used in determining the keeping qualities of sugar to be stored is also given. A systematic continuation of this work this season has been conducted by Dr. Margaret B. Church, of the United States Bureau of Chemistry, temporarily assigned for the purpose, and her findings will be published later.

The Entomological Department, in charge of men connected with the United States Bureau of Entomology, has done very good work, substantially aided by a sum of $10,000 contributed by a group of sugar planters for the purpose.

A large number of parasites were brought into the State by Messrs. Holloway and Barber. These were put out on plantations, and in many cases, it has been found that they thrive. In the canes at the Sugar Station, over three hundred were obtained from the field in November and are being carried over the winter for further work. The large number of parasites found here point to success with that beneficial insect, for while some of them most probably came from parasites released this year, there are too many to be accounted for in that way only. Many of them must have come from parasites that survived the winter of 1919. Again the mealybug infestation was found to be comparatively very low, due to a control of the Argentine ant by arsenical poison.

The annual Field Day of the Louisiana Sugar Planters' Association was held on the Station grounds. The attendance was large and the exhibits and field demonstrations unusually interesting and instructive.

**STATION NO. 2**

*State Stations, Baton Rouge, A. F. Kidder, Assistant Director and Agronomist in Charge.*

The work at this Station has been along the same general lines as the previous year, although several new projects have been started. All plats of each series were given the same treatment as in previous years, and good weather prevailed in nearly all cases, during the harvesting period.
The variety test work was transferred to new plats in order to carry the work on in a rotation. A brief statement is given of each project.

FERTILIZERS.

Project No. 1: A comparison of a mixture of cottonseed meal and acid phosphate when used with and without organic matter and applied at different times during growth. Corn is grown each year on these plats. The yields in 1920 show a marked variation in favor of the organic matter and only a small difference in time of applying the fertilizer.

Project No. 2: The effect of cowpeas, soybeans, and velvet beans (plowed under) on cotton and oats when planted in a two-year rotation of cotton, oats and legumes. Velvet beans plowed under gave a better yield of both cotton and oats than the other two legumes plowed under.

Project No. 3: The effect of soybeans sown in the corn at last cultivation on the yield of cotton and corn in a rotation of cotton and corn. The soybeans gave an increased yield of approximately one hundred per cent in both corn and cotton. It certainly pays to plant legumes in corn even in a short rotation.

Project No. 4: The effect of permanent cropping; corn and cowpeas; corn and velvet beans; corn and soybeans; lespedeza; and cotton. The cotton crop was approximately one-fifteenth of a bale per acre. All others gave fair yields.

Project No. 5: The effect of different applications of limestone. These plats were sown in Crimson clover during the winter of 1919-1920 and in Biloxi soybeans in 1920. There was no variation noticeable in the yield of the different plats.

CROPS.

Project No. 1: Cotton; selection and breeding. Seed of two varieties was distributed over the State and fair reports were obtained. The long staple selection was continued. In this work, a sufficient amount of seed from staple one and one-half inches in length was obtained to plant a large enough area to get over six hundred individual plants to continue the work in 1921. The long staple bale in 1919 was mixed some with short staple for this
character is not fixed. However, the bale was sold in Vicksburg, Mississippi for sixty cents a pound.

Project No. 2: Corn; selection and breeding. Selection of individual kernels from a hybrid corn together with hand pollination has given very good results in getting a yellow corn with a bright red cob. Work is being continued in attempting to get a white cob in the White Calhoun corn.

Project No. 3: Oats; selection and breeding. Preliminary work with an oat nursery work was started in 1919 and continued this year, with some quite noticeable variations. A number of plants were selected to continue this work because of higher yields, stronger straw and less rust. This project at the present time seems to be very promising of bringing good results.

Project No. 4: Variety tests of cotton, corn and oats. The varieties of cotton are classed as wilt resistant. There was not much variation in the test this year. Corn varieties from Louisiana and some promising varieties from the other Southern States were planted at the rate of 6,000, 7,000 and 8,000 stalks per acre. There was a very noticeable variation in the yield of varieties. In practically all cases the 6,000 stalks per acre produced more corn than the larger number of stalks per acre. There was a marked variation in the yield and growth of the oat varieties.

Project No. 5: Effect of strength of germination on yield of corn. There was a considerable variation in this work. The ears having a strong germination gave a much better stand of corn, practically one hundred per cent in all strong ears.

Project No. 6: Alfalfa; selection and breeding. A project to attempt to get a strain of alfalfa for bluff soils. Some progress made in 1920.

CROPS AND LIVE STOCK.

Project No. 1: Hogging off crops (corn and soybeans, corn and cowpeas, soybeans and sweet potatoes). Excellent results were obtained with the first two combinations and the soybeans alone. Shrimp bran was fed in self-feeder when the hogs were grazing on the sweet potatoes, with results that are far from gratifying. From this one test we cannot recommend feeding shrimp bran with sweet potatoes.
Project No. 2: Grazing different grasses and Kudzu with cattle. Ten steers grazed for 126 days on a pasture receiving different treatment as to mowing and plowing, and on Kudzu. Some very interesting results were obtained, especially with Kudzu and mowing the pasture. It will pay one to mow pastures once and possibly twice during the summer grazing period.

STATION NO. 3

North Louisiana Station, Calhoun.
G. D. Cain, Asst. Director, in Charge.

The work at this Station has been carried on as previously outlined, with the exception of projects on comparison of acid phosphate and raw rock phosphate; fertilizer experiments on cotton and corn; and varieties of sweet potatoes and sorghums, which were discontinued at the beginning of the year. Only one new project was added this year, a three-year rotation, comparing the effects of stable manure in different amounts and different methods of applying, on cowpeas, cotton and corn.

The rotation where a home-made compost was used for thirty years, shows clearly that the physical condition of the soil is very much better than where it has been used only twelve years; also that the compost must be applied every year to obtain the best results.

As this was the first year’s results of crops from the three-year rotation with stable manure, it is impossible to draw conclusions that would be at all reliable.

In the corn variety test, it is shown that a prolific type produces a good yield for the sandy hills section of North Louisiana. The old and proven variety, Calhoun Red Cob is as good a variety of corn as can be grown in North Louisiana.

In variety test with cowpeas, we have found a few very promising varieties for this section, but about the best all-around cowpea for our use is the New Era.

The Mammoth Yellow variety is about the best soybean for our use. There are a few other varieties such as Barchett, and Virginia that are becoming very popular, especially for hay.

The Osceola velvet bean is one of our best yielding varieties,
this year's results being two tons per acre of beans in the pod.

On account of ideal conditions for boll weevil infestation this year, our cotton variety test was not as accurate as it otherwise would have been.

**PORK PRODUCTION.**

Hogs grazed on corn and soybeans produced 15.4 lbs. of pork per bushel of corn. This shows again that the most profitable way for a farmer to market his surplus corn is by allowing the hogs to harvest the crop and sell the hogs.

**ORCHARD AND VINEYARD.**

Very little attention has been paid, in an experimental way, to the orchard and vineyard this year. It has been kept principally as a demonstration that grapes, plums, peaches and other fruits can and should be raised by the farmers in this section.

**WEATHER CONDITIONS.**

The lowest temperature recorded was 17°F. in November; the highest was 104°F. in July. The total rainfall was 70.96 inches, fairly well distributed throughout the year.

**NORTH LOUISIANA AGRICULTURAL SOCIETY.**

A great deal more interest was taken in the meetings held at the Station by the North Louisiana Agricultural Society this year than in 1919. The members of the Society voted to revive the annual fairs that were held at the Experiment Station up to 1916.

**STATION NO. 4**

*Rice Experiment Station, Crowley.*  
*J. M. Jenkins, Assistant Director, in Charge.*

The same lines of investigation were pursued as reported for the year 1919, and a few new projects started. Weather conditions were exceedingly trying during the seeding and growing season. Heavy rains during the winter months left the soil in a wet, compact condition; this followed by high winds at seeding
time, made it impossible, in many cases, to obtain a good seedbed. Frequent rains during the summer interfered with cultivation, but were very beneficial in the matter of supplying irrigation water. The total precipitation for the year was 68.01 inches. This was nearly three inches more than the highest recorded for any one of the past ten years, at this Station. While the precipitation was heavy, we were fortunate in having good harvest weather.

The results for the year were very satisfactory in practically all lines of investigation. Much information was obtained of a conclusive nature, and of such character as to enable more intelligent research in the future.

The Pathologist, assigned to work with rice diseases, by the Office of Cereal Investigation, of the United States Department of Agriculture, was able to confirm work already done by others, relative to "straihthead" and succeeded in working out very satisfactory control methods, that will be used in the future for more extensive experiments along this line. His work has also given very accurate indications as to the cause of this condition, commonly known as straihthead. A bulletin on this subject is now being prepared jointly by the Pathologist and the Assistant Director. In addition to his work with straihthead, Dr. Tisdale discovered two diseases, not heretofore reported as attacking rice.

Our results with fertilizers, including lime in different quantities, are such that we feel that very conclusive information along this line can be given before very many years.

The results of experiments along the lines of irrigation and other cultural methods, including preparation of soil, manner and rate of seeding, character of seedbed, etc., for the past ten years, are being prepared for publication in the near future.

The work of introducing new rices, giving evidence of greater merit than those now grown commercially, has progressed very nicely. Two varieties were on a rather large acreage this season and gave results very much in excess of commercial rices, according to reports from cooperators.

During the State Fair, we served in our booth, at a certain hour each day, cooked rices, composed of three commercial varieties and four that are being introduced by this Station, re-
questing those testing them to vote on the one preferred. This rice was served in a plain boiled state, for the purpose of determining whether or not differences in flavor would be detected by the general public. The results obtained indicate very clearly that the public detects differences, and has special likes and dislikes in the matter of rice as well as in other things.

During the last six days of the contest, three hundred and forty-six votes were cast for the eight rices; out of this number the two leading commercial rices received a total of seventy-two, and the two leading Station rices, a total of one hundred and ninety. The remaining votes were scattered rather evenly among the remaining four varieties. I might add that the variety occupying the leading place as to commercial acreage, received only thirty-three votes out of a total of four hundred and fifty-six, while the leading Station rice received eighty-eight; and another Station rice, not so extensively grown, received one hundred and forty-seven votes. This would indicate that the consumer is not getting the variety of rice that he would prefer.

DEPARTMENT OF PLANT PATHOLOGY
Baton Rouge.

Dr. C. W. Edgerton, Pathologist in Charge.
C. C. Moreland, Assistant.

The work in the Department of Plant Pathology during 1920 was, in general, a continuation of the work of previous years, consisting of investigations on a number of the important plant diseases of the State. The projects which have received the most attention include the following:

SUGAR CANE DISEASES.

The results on the effect of fungi on the germination of cane were published in bulletin form during the year. It was found that the fungus causing the red rot disease, Colletotriehum falcatum, was instrumental in reducing the germination of the "eyes" or buds of cane.

The Mosaic disease of cane spread very rapidly during 1920. There is now a very heavy infection all along the river, and the
disease is present to a considerable extent along Bayou Lafourche. It is also appearing in isolated places in the western part of the sugar belt. Recent investigations bear out the observations made in previous years that the L-511 seedling is the most resistant to the disease of any of the important canes of the State. It has also been demonstrated that healthy cane of this variety can be selected by an examination of the stalks. This makes the seed selection work much easier.

Experiments have also shown the extreme susceptibility of the D-95 cane to the Mosaic disease. Data on the susceptibility of other varieties have also been obtained.

**TOMATO WILT.**

The results of several years work on the tomato wilt were published in bulletin form during the year. The work for the year consisted in testing out a number of wilt resistant varieties of tomatoes and continuing the selection work for wilt resistance. The Louisiana wilt resistant selections still continue to give very satisfactory results.

**EGGPLANT BLIGHT.**

The work on the eggplant blight was brought to a close during 1920. The results which have been obtained have been compiled and will be published in bulletin form during the early part of 1921.

**CORN DISEASE PROJECT.**

A new project on corn diseases was started during 1920. The project will include studies of the various organisms attacking root, stem and ear.

**OTHER PROJECTS.**

Other projects which received some attention during the year were the cotton wilt, alfalfa diseases and the Sclerotium disease.
During the year 1920, the Bacteriological Division has continued the investigation of some of the important animal diseases of the State.

During the summer months anthrax developed in many of the Parishes, causing considerable loss in animals. On account of these outbreaks, many specimens were sent to the Station laboratory for examination. At least fifty per cent of these specimens were received in bad condition. The blood smears had not been properly prepared by the senders, and on arrival at the Laboratory, putrefactive organisms were present in great numbers. Some of these organisms resembled the anthrax germ so closely that it was difficult to make a correct diagnosis in a short period of time. Various methods of identification were studied during the year. In the majority of cases definite information could be furnished the livestock owner without delay, if the blood smears were prepared in the proper manner—directions for which have been published from time to time.

Although anthrax developed on several farms in East Baton Rouge Parish during the past year, there was not a case among the livestock on the Station farms, all the animals having been treated with anthrax vaccine during the months of March.

Some study has been given the infectious swine disease, commonly known as "Mixed Infection." The data obtained, however, were so varied and confusing as to make it impossible to draw accurate conclusions. But from the observations made, these conditions should be eliminated in the majority of cases of so-called "Mixed Infections"—hog cholera, parasites and insanitary surroundings.

Infectious abortion developed in the Station dairy during 1919, with about one hundred per cent loss in calves. However, with strict sanitary rules observed by the Superintendent in charge, the infection appears to have been eradicated, with the result that, during 1920, almost a normal crop of calves were raised, and the herd has since been in a very healthy condition.
DIVISION OF PARASITOLOGY.

Dr. G. Dikmans.

The work in animal parasitology was begun about October 1, 1920. The scope of the work so far has been confined to determining the types of parasites found in meat-producing animals, and the relative frequency of their occurrence as evidenced by the examination of carcasses of animals slaughtered at the Baton Rouge Municipal abattoir and such other instances as are brought to the attention of the Parasitologist. It is proposed to extend the scope of the work to cover as large a portion of the State as is practicable at some later date. No special problem in connection with this work is being undertaken at the present time, but this phase of the problem will receive due attention at the proper time.

Owing to unavoidable delays in obtaining the necessary equipment, progress has not been as rapid as might have been desired. However, it is confidently expected that this situation will be remedied in the near future.

Dr. Dikmans came to the Institution at the beginning of the College session 1920-21, as Assistant Professor of Veterinary Science, in the College of Agriculture, and Parasitologist of the Experiment Stations.

DEPARTMENT OF ENTOMOLOGY
Baton Rouge.

Thos. H. Jones, Entomologist in Charge.
W. G. Bradley, Assistant.

When the present Entomologist took charge of the work of this Department on July 1, 1920, it was decided to restrict largely the research work to the principal insects injurious to corn and livestock in the State. These include the Southern corn rootworm or budworm, the corn earworm, the rice weevil, or black weevil, a serious pest of stored corn, the horn fly, and the mosquitoes, horse flies, and warble flies that attack livestock.
The progress made on these projects has necessarily been limited, due largely to the fact that they were not taken up until the middle of the year. Something in the way of a foundation on which future work can be based, has, however, been laid down, for all the projects.

Some time has been spent in building up a collection of injurious insects, particularly those of Louisiana, with the idea of using this material both for display purposes and in connection with the making of identifications of insect material sent in by correspondents.

Numerous letters, asking for information concerning various insects, and coming largely from correspondents in Louisiana, have been received and answered and articles concerning some of the more important insect pests have been given to the press. An extension circular on the pink bollworm, prepared in collaboration with Mr. W. E. Anderson, Entomologist of the State Department of Agriculture, has also been published.

T. H. Cutrer, Thos. H. Jones and C. E. Smith, while members of the Bureau of Entomology, United States Department of Agriculture, have all been stationed at Baton Rouge at different times during 1920, for cooperative work with the Experiment Stations, on truck crop insects.

DEPARTMENT OF HORTICULTURE
Baton Rouge.

G. L. Tiebout, Horticulturist.

Irish Potato Seed Improvement: In cooperation with the United States Department of Agriculture, experiments were continued (second year) in the comparison of inspected Irish potato seed stock with commercial seed stock procured through Louisiana dealers. Thirteen lots of inspected Triumph seed stock were sent from Wisconsin, Nebraska, and Minnesota by the United States Department of Agriculture. These, with four lots as checks of commercial seed stock, procured from Louisiana dealers, were planted in six sets at different dates. Most of the sets did not meet with favorable weather conditions and results were not
satisfactory. One set, however, was planted and grown at a time more favorable for potato production, and the representatives from Washington chose this one for the records. Results showed that the inspected stock from Nebraska and Wisconsin, on an average, showed an increase over the average of the commercial seed stocks. There were some very striking yields made by some strains of the inspected stock. The average of the Minnesota strains fell a little below the average of the commercial stock. In connection with this work, an inspection trip was made of fields where certified stock was being grown in Wisconsin.

Investigations and demonstrations in the growing and marketing of Royal King bell peppers, in the culture of rhubarb and sweet corn, and in shipping of Brussels sprouts to the New Orleans market, have been carried on.

Bell peppers of the Royal King variety were grown and shipped by express in commercial quantities to the northern markets. The earlier fruit was fine. In the fall, however, the Mosaic disease ruined the crop, and the usual marketing of red fruits in New Orleans for pickling purposes, was not carried out as trial shipments indicated that the quality was not satisfactory, due no doubt, to this disease.

Our experiments in the culture of rhubarb indicate that it can be satisfactorily grown under garden conditions by importing two-year roots from the North each year.

Demonstrations in the shipping of Brussels sprouts to New Orleans indicate a demand for limited quantities at high prices.

Investigations in the production of sweet corn for the home garden show that delicious ears for the table can be had continuously over a period of eight to twelve weeks by making succession plantings. Sweet corn is not commonly grown in Louisiana.

A large portion of the Horticulturist's time is occupied with miscellaneous activities. He cooperates in the growing and marketing of the crops for five scientific projects; he maintains growing vegetables, nursery, orchard and greenhouse for the use and observation of cooperators.
HERD MANAGEMENT AND REGISTER OF MERIT WORK.

The herd was managed in practically the same way as last year. At the close of the year the herd consisted of sixty-five head, all pure bred. Twelve head of cattle, eight females and four bulls, were sold during the year to farmers over the State.

The Register of Merit work was continued from last year and three more cows completed creditable records. Thirteen more have been placed on test and the monthly reports show the best records ever obtained during any other year by a Jersey. The highest record heretofore for a Jersey was 47.72 lbs. fat, made by Creampot Bessie No. 3362854, in 1919, while the highest obtained for a Jersey in 1920 was 67.3 lbs. fat in the month of December, by Lady of Beechwood No. 388982. This record is exceeded by only one other record and that was made by Bell Bettina Skylark No. 159059, a Holstein, in 1919, when she made 75.61 lbs.

The results obtained in combating contagious abortion seem to be in keeping with the prediction of last year, as only six abortions occurred in 1920 as against twenty-two in 1919. Twenty-three normal calves were dropped in 1920 as against fifteen in 1919. Very favorable comments by authorities on contagious abortion have been made on the splendid results obtained.

FEEDING EXPERIMENTS.

Two experiments in feeding were begun this year:

(1) To ascertain the physical effects of low-grade cane molasses, commonly called "Blackstrap" molasses on young calves; (2) Rough rice as a feed for dairy cows.

Neither of these experiments has been completed. However, the results obtained so far from the feeding of blackstrap molasses to calves are conclusive enough to show that it can be fed safely to young calves on their grain feed without any bad physical effects.
The grain fed with the molasses consisted of 100 lbs. wheat bran, 50 lbs. ground oats, 50 lbs. corn meal and 50 lbs. velvet bean meal. As a check some calves were fed the grain mixture without the molasses. It is expected to continue this experiment with some minor changes—for instance, the molasses will be fed to some calves in the milk.

The rough rice experiment was begun in November. The idea of this experiment is to determine its value as a dairy feed, and to note the physical effect of the rough rice on the animals.

A ration was composed of 350 lbs. of ground rough rice and 100 lbs. of 7% cottonseed meal and is being fed against a ration which consists of 350 lbs. corn meal, 100 lbs. 7% cottonseed meal, 100 lbs. wheat bran. The rice ration is evidently not as palatable as the corn meal ration, as it took several days to get all cows to eat it, and occasionally some cows will refuse to eat it after a preliminary period of twenty-one days. However, this experiment has not been in operation long enough to get the final results in this report. So far, no untoward effect from the hulls has been noticed.

**FORAGE CROPS.**

The forage crops grown on the Dairy farm this year consisted of velvet beans and corn, soybeans and corn, sorghum, alfalfa, soybeans, oats, vetch, lespedeza, native hay, turnips and rutabagas. Two fields of corn and soybeans were grown for silage, one early and the other after oats. The yields were fairly good in both fields, especially the late crops, as the soybeans were above the average. Sorghum was planted after the oats for silage. About two acres of soybeans were planted for hay after oats.

The oats and vetch did not make as heavy a yield as the year before, but the quality of the hay was much better.

The lespedeza and native hay was cut in September, and was saved in very fine condition, as the weather conditions were quite favorable for the harvesting of hay. The yield was good, averaging about two tons.

The turnips and rutabagas were planted the first week in September. They were not so good on account of the dry weather, but were large enough to begin feeding the latter part of October.
The rutabagas did better than usual, and were ready to feed in December.

In February one acre of ground was planted in alfalfa. The land was prepared by plowing into beds about sixteen feet wide, with deep water furrows between, thereby giving good drainage. About six tons of raw limestone, and a good application of stable manure were applied, the ground well harrowed and allowed to settle before planting. South Dakota No. 28 was the variety used. It is a very fine-stemmed variety, and makes hay of excellent quality but falls down under heavy rains. The acre yielded 4,270 lbs. of good cured hay, 830 lbs. damaged hay—this was the third cutting and was as good as the second cutting, which amounted to 1,700 lbs. and 1,000 lbs. of crabgrass with a few stems of alfalfa. The plat was cut five times, the last cutting being given the latter part of September. Between 6,000 and 7,000 pounds of hay were cut off the acre during the entire season. The alfalfa stood the season well until about August, when the weather began to get hot, and the ground dry and hard. At that time the grass began to do its best. The alfalfa died out in spots and on the sides of the beds. It is the purpose to reseed these spots again in February 1921.

CARE OF THE PERMANENT PASTURES.

A part of the permanent pasture north of the railroad was plowed, disced, terraced, and planted in oats, barley and white clover. The native grasses which followed these grew better, and fewer weeds came up on this part than on the part that was not plowed. The weeds were cut on all parts with the mower where possible, and by hand where the machine could not be used. Both pastures were drained during the year.

DEPARTMENT OF EXHIBITS

Baton Rouge.

A. A. Ormsby, Specialist.

In cooperation with the Louisiana State University, the Agricultural Extension Division, and the State Department of Agriculture, the Louisiana State Experiment Stations made exhibits and demonstrations in 1920 at the State Fair of Louisiana, at
Shreveport, from October 28 to November 7, and at the International Live Stock Show at Chicago, November 27 to December 4.

At the State Fair of Louisiana, under the general direction of Mr. G. L. Tiebout, Horticulturist, comprehensive educational displays and demonstrations were made in various lines of horticulture and pomology by means of charts, photographs, farm products etc.

Under the direction of Mr. J. Mitchell Jenkins, of Crowley, an exhibit of the work of the Rice Experiment Station was made by the use of rice sheaves, panicles, seed and the milled product. Cooking demonstrations were conducted by an experienced home demonstration agent, who prepared eight varieties of the milled product in food dishes and passed the same out to the visiting public.

The North Louisiana Station of Calhoun and the Audubon Park Sugar Station of New Orleans were represented by products dealing with their respective activities. The Experiment Station laboratories, directed by C. R. Hummel, had a very attractive display, consisting of charts, photographs, and chemical apparatus, showing how the laboratory work is conducted, and the results of scientific investigations in the use of feeds and fertilizers.

Following the close of the State Fair of Louisiana, a large portion of the exhibit material of the State Experiment Stations was packed and shipped to Chicago, where it was included in the Louisiana State exhibit at the International Live Stock Exposition. In addition to the display of agricultural products and illustrative material at Chicago, bulletins and circulars of the Louisiana State Experiment Stations were distributed to the visitors. More than 350,000 people attended the show at Chicago. The Louisiana exhibit comprised about 500 square feet of wall space and 300 feet of floor space, and was made up largely of specimens and samples of practically every farm crop grown in this State.
FERTILIZER AND FEED STUFFS LABORATORY.

Between forty-five hundred and five thousand official feed and fertilizer samples were analyzed during the year 1920. These samples were collected through the office of the Commissioner of Agriculture and represent shipments of all feeds and fertilizers sold in the State during the year.

All miscellaneous samples, sent by individuals, pertaining to agriculture, were analyzed free of charge. These included feeds, fertilizers, water, minerals, etc. Inspection and examination of animal carcasses for suspected poisons were made. Cases of feed adulterants were examined and reported on. Suspected cases of harmful fertilizer ingredients were taken up and the fertilizers in question analyzed.

Mr. Sam Byall, connected with the Fertilizer and Feed Stuffs Laboratory of the Experiment Station, for the past ten years, resigned his position September 30, to take up research work with Penick and Ford, of New Orleans. Mr. A. D. Lipscomb of Auburn, Ala., was added to the chemical staff in the spring of 1920.

SOIL LABORATORY.

The soil laboratory continued the routine work of examining and classifying soil types throughout the State, and also made examinations and estimates for soil requirements, of miscellaneous samples.

PUBLICATIONS

The following publications were issued during the year:

Experiment Station Bulletins.

No. 168—Anthrax (Transmission of Infection by Non-biting Flies), by Harry Morris.
No. 169—Effect of Fungi on the Germination of Sugar Cane, by C. W. Edgerton and C. C. Moreland.
No. 170—Factors Determining the Keeping Qualities of Cane Sugar, (With a Chart for Prediction), by N. Kopeloff.
No. 171—The Amount of Salt in Irrigation Water Injurious to Rice, by F. C. Quereau.
No. 172—Rice Investigations, by F. C. Quereau.
No. 173—The Clarification of Cane Juice Without Chemical Treatment, by F. W. Zerban.
No. 175—The Prevention of Sugar Deterioration, by N. Kopeloff, C. J. Welcome and Lillian Kopeloff.
No. 176—A Method of Selecting L-511 Cane Free of the Mosaic Disease for Planting Purposes, by C. W. Edgerton.
No. 177—Chemical Composition of Some Louisiana Soils as to Series and Texture, by S. S. Walker.

ANNUAL REPORT SERIES.

Annual Report of Agricultural Experiment Stations for 1919.

JOURNAL ARTICLES.


CHANGES IN STAFF

The following changes in personnel of the Station Staff were made during the year:

W. R. Dodson, Director, resigned August 1919, effective January 1, 1920. W. H. Dalrymple, Vice-Director and Veterinarian of the Experiment Stations was appointed to succeed him.

F. W. Zerban, Research Chemist at the Sugar Station, New Orleans, resigned April 1, 1920. Position still vacant.

N. Kopeloff, Bacteriologist at the Sugar Station, New Orleans, resigned July 1, 1920. No appointment has been made to fill this position.

G. H. Hopkins, Assistant Chemist, at the Sugar Station, New Orleans, appointed January 1, 1920; resigned April 1, 1920.

C. J. Welcome, Assistant Chemist, Sugar Station, appointed February 1, 1920; resigned June 1, 1920. W. G. Raines, appointed to succeed Mr. Welcome.

Sam Byall, Assistant Chemist, Fertilizer and Feed Stuffs Laboratory, Baton Rouge, resigned September 30, 1920, to accept a commercial position.

E. A. Maier, Farm Manager at the Station at Baton Rouge, resigned November 30, 1920, to accept a position on a large sugar plantation near Baton Rouge.

Sidney Stewart was appointed Farm Manager at the North Louisiana Station, Calhoun, July 1, 1920.

H. H. Winters, appointed as Assistant to the Superintendent of the Rice Station, June 1, resigned September 30, 1920.

Gerard Dikmans was appointed Parasitologist and Asst. Veterinarian September 1, 1920.

T. H. Jones was appointed Entomologist of the Stations, July 1, 1920.

W. G. Bradley was appointed Assistant Entomologist, September 15, 1920.

A. A. Ormsby, Specialist in Exhibits, was appointed July 1, 1920.

Mrs. Helen Hardy was appointed to the position of Mailing Secretary October 15, 1920.
E. K. Breeden was appointed Farm Manager at the State Station, to succeed E. A. Maier.

A. D. Lipscomb was appointed Assistant Chemist in the Fertilizer and Feed Stuffs Laboratory, February, 1920.

FINANCIAL STATEMENT

Hatch and Adams Funds.

Dr.

Received from the Treasurer of the United States, as per appropriation for fiscal year ending June 30, 1920, under Acts of Congress approved March 2, 1887, (Hatch Fund) and of March 16, 1906, (Adams Fund) $15,000.00 $15,000.00

Hatch Fund Adams Fund

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Total ................................ $15,000.00 $15,000.00

STATE FUND.

Statement of receipts and expenditures of the State Fund from January 1, 1920 to December 31, 1920:
Receipts.

State Treasurer ............................................. $37,250.00
^Sales .......................................................... 7,886.50
Refunds ....................................................... 1,556.09
Interest on Daily Balance ..................................... 302.10
Transferred from Fertilizer Fund .......................... 6,000.00

Total ............................................................. $52,994.69

Expenditures.

Salaries ....................................................... $13,799.86
Labor .......................................................... 14,546.25
Publications ................................................... 1,042.49
Postage and Stationery ....................................... 597.38
Freight and Express .......................................... 474.63
Heat, Water and Light ........................................ 1,446.34
Chemical Supplies ............................................ 11.00
Seeds and Sundry Supplies ................................... 2,432.02
Fertilizers .................................................... 181.21
Feed Stuffs .................................................. 1,564.54
Library ......................................................... 25.98
Tools, Implements and Machinery ............................ 4,290.95
Furniture and Fixtures ....................................... 306.30
Scientific Apparatus and Specimens ....................... 1,823.08
Traveling Expenses ........................................... 1,823.08
Live Stock ..................................................... 1,964.48
Contingent Expenses .......................................... 2,481.69
Buildings and Repair ........................................ 2,580.99

Total ............................................................. $49,569.19

Deficit January 1, 1920 ....................................... 3,241.26

Balance on hand, Dec. 21, 1920 ................................ $52,810.45

*The amount reported under sales should not be counted as additional revenue, as, to a very large extent, it represents merely a turn-over of other funds, and may, in some cases, represent a loss, if the products disposed of should bring less than the cost of their production as experiments.

FERTILIZER AND FEED STUFFS FUND.

Statement of the receipts and expenditures of the Fertilizer and Feed Stuffs Fund, from January 1, 1920 to December 31, 1920:
Receipts.

Commissioner of Agriculture .................................. $27,335.65
Refunds ...................................................................... 199.12
Balance on Hand, January 1, 1920 .............................. 4,517.53

Total ........................................................................ $32,052.30

Expenditures.

Salaries ...................................................................... $13,731.32
Labor ......................................................................... 2,391.77
Postage and Stationery ............................................ 650.55
Freight and Express ................................................... 143.37
Heat, Light and Water .............................................. 932.17
Chemical Supplies ..................................................... 2,155.86
Seeds and Sundry Supplies ........................................ 464.40
Feeding Stuffs ............................................................ 113.58
Fertilizers ................................................................. 439.90
Library ...................................................................... 57.77
Tools, Implements and Machinery .............................. 215.85
Furniture and Fixtures .............................................. 281.00
Scientific Apparatus ................................................. 767.48
Traveling Expenses .................................................. 521.72
Contingent Expenses ................................................. 226.04
Building and Repairs ................................................ 346.02

Total ........................................................................ $23,438.80
Transferred to State Fund ........................................... 6,000.00

$29,438.80

Balance on hand, December 31, 1920 ......................... 2,613.50

Total ........................................................................ $32,052.30

EXPERIMENT STATION DAIRY.

Statement of Receipts and Expenditures of the Experiment Station Dairy Fund from January 1, 1920 to December 31, 1920:

Receipts.

Milk ........................................................................ $ 3,558.20
Live Stock ................................................................. 2,382.55
Miscellaneous .......................................................... 408.08

Total ........................................................................ $ 6,348.83
Cash on hand, December 31, 1919 .............................. 484.99

Total ........................................................................ $ 6,833.82
### Expenditures

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