1922

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

William Rufus Dodson

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THIRTY-THIRD ANNUAL REPORT

OF THE

Agricultural Experiment Stations

OF THE

Louisiana State University and Agricultural and Mechanical College

TO THE GOVERNOR

FOR 1921

By

W. R. DODSON, Director
January 28, 1922.

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 1921.

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 funds for research work at the experiment stations of the several states, a financial statement is appended, for the year beginning July 1, 1920 and ending June 30, 1921.

Respectfully,

W. R. DODSON,
Director.
EXPERIMENT STATION STAFF

W. R. DODSON, A. B., B. S., Director.
W. H. DALRYMPLE, M. R. C. V. S., Vice-Director and Veterinarian.
W. G. TAGGART, B. S., Assistant Director, Sugar Station, New Orleans.
A. F. KIDDER, B. S., Assistant Director and Agronomist, Baton Rouge.
G. D. CAIN, B. S., Assistant Director, North La. Station, Calhoun.
J. MITCHELL JENKINS, B. S., Superintendent Rice Station, Crowley.
C. W. EDGERTON, Ph.D., Plant Pathologist, Baton Rouge.
C. C. MORELAND, B. S., Assistant Plant Pathologist, Baton Rouge.
HARRY MORRIS, D. V. M., Bacteriologist and Veterinarian, Baton Rouge.
G. DIKMANS, Parasitologist and Assistant Veterinarian, Baton Rouge.
T. H. JONES, B. S., Entomologist, Baton Rouge.
W. G. BRADLEY, B. S., Assistant Entomologist, Baton Rouge.
G. L. TIEBOUT, B. S., Horticulturist, Baton Rouge.
R. W. AXT, B. S., Assistant Horticulturist, Baton Rouge.
J. F. BREWSTER, Ph.D., Research Chemist, Sugar Station, New Orleans.
WM. L. OWEN, B. S., Bacteriologist, Sugar Station, New Orleans.
W. G. RAINES, Assistant Research Chemist, Sugar Station, New Orleans.
A. P. KERR, M. S., Chief Chemist, Fertilizer and Feed Stuff Laboratory, 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.
C. R. HUMMEL, B. S., Assistant Chemist, Baton Rouge.
J. L. FARR, M. S., Assistant Chemist, Baton Rouge.
R. P. SWIRE, Treasurer.
MRS. RUTH HEIDELBERG, Secretary, Baton Rouge.
A. A. ORMSBY, Specialist in Exhibits, Baton Rouge.
R. C. CALLOWAY, B. S., Superintendent of Dairy Farm.
MRS. HELEN HARDY, Mailing Secretary, Baton Rouge.
J. K. McHUGH, Stenographer, Sugar Station, New Orleans.
E. K. BREEDEN, Farm Manager, State Station, Baton Rouge.
SIDNEY STEWART, Farm Manager, North La. Station, Calhoun.
ALVERTA WRIGHT, Stenographer, Rice Station, Crowley.
GENERAL REMARKS

During the summer months Dr. W. H. Dalrymple's health became so impaired that he tendered his resignation as Director of the Experiment Stations and Dean of the College of Agriculture. Dr. Dalrymple has very ably served the Experiment Stations and the University for nearly thirty years, the past two years as Director and Dean. With less exacting duties he is making marked improvements in health and is now able to devote practically full time to the miscellaneous duties of correspondence, advisor, and Associate Director.

The writer, in response to an invitation of the Board of Supervisors, extended through President T. D. Boyd, returned to the University on the 10th of October, 1921, under an agreement by which he may give the greater portion of his time to the duties involved in the expansion of the agricultural work of the University. We are not, at this time, prepared to make recommendations regarding the readjustment of Station and College work.

STATION NO. 1

Sugar Experiment Station, Audubon Park, New Orleans.
W. G. Taggart Ass't. Director in Charge.

SUGAR CANE WORK

In 1921 the seasons were more favorable than the previous year and slightly better labor conditions prevailed. However, labor had not yet reached normal and we had to content ourselves, to a large extent, with second-class farm help. Some of the work which was temporarily dropped in 1920, was again taken up but on account of expectation that the Station would be moved at the end of the year, a part of the field work was left out of our plans.

After almost two years of effort we have been able to permanently reorganize our staff, on which two important vacancies had existed, due to resignations. Dr. J. F. Brewster, formerly connected with the U. S. Bureau of Chemistry, was induced to accept the position of Research Chemist. Mr. W. L. Owen, who formerly had done notable work in our bacteriological laboratory, and later was with
a large canning company, returned to his former position with the Station.

The yield of sugar cane was better than that of last year, but still not as good as we had been accustomed to get. The cause of the poor yield no doubt was due to some extent, to diseases. While this condition prevents us from making as good a showing in the eyes of the public as we would like, it at the same time affords us opportunity to get in closer touch with these parasites that are threatening the sugar industry. While this condition may not be altogether to our liking, we appreciate the opportunity and are trying to take full advantage of it; and after all, our work is experimental, not demonstrative. The yield of cane, due to the usual application of nitrogenous fertilizers in its several forms, again gives variable results. Ammonium nitrate gave highly profitable returns, and was followed closely by calcium cyanamid, nitrate of soda and sulphate of ammonia. Of the organic nitrogenous materials, cottonseed meal gave better returns than tankage. The double ration of phosphoric acid (72 pounds) gave better returns than a single ration (36 pounds). It is gratifying to see that planters are duplicating this experiment on their plantations. Two experiments out of three in which a complete fertilizer containing 90 pounds of sulphate of potash per acre, gave better results than the check, which was equivalent quantities of nitrogen and phosphoric acid. The third of these experiments showed a loss where the complete fertilizer was applied. Work with clovers on fall plant cane was continued, and the results showed the necessity of inoculating cleaned sweet clover seed, whereas we have not found it necessary to inoculate when seed in the hull was used. Benefit from sweet clover was clearly visible along the outer edges of the plat, or in other words, near where this crop had grown wild the year before. No nodules could be found on clover in the center of the plat, and no benefit to the cane could be seen. Crimson clover planted on fall plant cane again smothered the cane. We now have sufficient data on that crop to again recommend the use of it as a fall cover crop on fall plant cane.
Sweet clover on fall plant cane was applied on several thousand acres of cane last year.

L 511 cane again showed a high sucrose content and resistance to mosaic disease, but was badly damaged by some unknown cause. Tonnage from it was extremely disappointing. A good number of other seedlings were found to be resistant to mosaic disease. These have been set aside for further test.

Special study of the mosaic disease of sugar cane, and the effect of selecting seed was made by the Station Pathologist. This work has been carried on for two years, and the data so far at hand are encouraging. No means have yet been found to measure the damage done by the disease.

A plat of ground was assigned to the Station Entomologist for studies of corn insects in this latitude, as compared with that of Baton Rouge.

The Planter's Annual Field Day was largely attended, and was in every way a success.

Assistance was given to a number of farm implement manufacturers and inventors having new implements in development for use on sugar plantations.

The U. S. Department of Agriculture Bureau of Entomology still assigns two of its men to our Station. Mr. T. E. Holloway reports that the Cuban parasite which was imported by his department, has withstood Louisiana winter conditions and that parasites have been found on seventeen plantations, where they were put out the year before. And, more encouraging still, that on another plantation where parasites were released two years ago, a parasite was found which indicates that it is quite possible for this beneficial insect to adapt itself to the Louisiana climate.

Mr. E. R. Barber of the Bureau of Entomology, reports that his department has made and shipped to points in Louisiana, Alabama and Mississippi, from this Station, over five thousand gallons of ant poison, and that about thirty-five miles of the City of New Orleans, which is more than half its area, has been covered with ant poison. He
estimates that this work will save about $16,000 in commercial ant poison and additionally, about half a million dollars wastage to the people living within the controlled area.

RESEARCH CHEMICAL DEPARTMENT

A new method of control of the sulphitation process in the manufacture of white sugar was tried in large-scale practice at the Station sugar house, with satisfactory results. The new method of control consists in the use of suitable indicator solutions to determine the proper end points of treatment with sulphur dioxide and with milk of lime. The method is simple of execution and is much less time-consuming than the present method of titration.

In all the present methods of cane juice clarification a precipitate or cloudiness forms in the syrup upon evaporation, which interferes with the obtaining of high grade sugar unless it can be removed. This is accomplished by filtration of the syrup. A study has been made of the formation of this precipitate. The results obtained indicate that precipitation depends upon the temperature to which the syrup is heated during evaporation. By heating to near the boiling point of water, precipitation is made complete and settling is rapid, thereby facilitating its removal.

The very interesting coloring matter which gives to the rind of Louisiana purple cane its color, has been isolated and is being studied. This dyestuff belongs to the same class of compounds, the anthocyanins, which are responsible for the red, purple and blue colors of the petals of flowers and the skin of fruits. The effects of the presence of this dyestuff upon the color of cane juice, syrup and sugar house products will be studied.

Results of experiments by W. G. Raines in conjunction with Dr. C. E. Coates, indicate that a very high grade de-colorizing carbon suitable for sugar refining may be obtained from sugar cane bagasse. This subject had been previously studied by others, but the importance of the results had not been fully appreciated at the time. There is thus added another cheap and plentiful raw material to the
list of substances which may be used for the production of decolorizing carbons.

DEPARTMENT OF BACTERIOLOGY.

Work in the bacteriological department was suspended during approximately half of the past year, due to the vacancy caused by Dr. Kopeloff's resignation. Dr. Church, who had been temporarily assigned to the Station, returned to the Bureau of Chemistry in March, and a bacteriologist was not appointed until August. Dr. Church during the short time that she was in charge, made substantial contribution to the problems of sugar deterioration. As a result of her investigations, a clearer understanding was obtained regarding the source of infection of sugar products, the distribution of micro-organisms in these sugars, and in the molasses separated from them, and the efficiency of superheated steam in the centrifugals, as a means of improving the keeping qualities of sugars. The investigations in this department since their resumption, have for the most part consisted in a continuation of the phases of sugar deterioration that were initiated by Dr. Kopeloff. Special attention has been directed towards determining the part played by mold spores in causing sugar deterioration, and the possible value of the steam process as a means for improving the keeping qualities of various types of sugars. Much experimental work has also been carried out on the meaning of the "Factor of Safety" of sugars, when translated into terms of physical and chemical qualities of the molasses film around sugar crystals. From the data that have been secured so far, it seems likely that the investigations now in progress will serve to explain many apparently inconsistent examples of deterioration of sugars which should have kept well, as well as those cases of sugars not deteriorating which by all indications should have. The completion of this investigation should result not only in furnishing a basis for a more accurate prediction of the behavior of sugars in storage, but should lead to an improved method of sugar manufacture, by means of which Louisiana sugar can be held indefinitely without fear of deterioration in quality.
In addition to the investigation of sugar deterioration, considerable attention has been given to the investigation of the conditions affecting the formation by bacteria of gum lavan from sugar solution. This work is intended as a confirmatory test of some of the experimental data published in Bulletin No. 125, but carried out in the present instance by methods that afford a more accurate chemical estimate of the changes produced. The results so far entirely confirm the results obtained in the earlier investigations. The work has, to only a slight degree, an ultimate utilitarian purpose. It will undoubtedly contribute some data of practical value on the nature of the changes in the fermentation of cane juice. Its chief purpose, however, which is purely scientific, is to trace the course of development of the acquired power of gum formation by a group of bacteria which ordinarily lacks this power; whether this ability is rapidly acquired, or whether it is of a gradual transition, determined by an environment of specific chemical and physical composition, is what we are endeavoring to learn.

Preliminary investigations on the bacterial flora of cane juices, and the types of fermentation to which this product is most susceptible, with special reference to dextran formation, are also in progress.

**STATION NO. 2**
Baton Rouge, La.

A. F. Kidder, Agronomist and Assistant Director in Charge.

The work of the State Station in 1921 was devoted to agronomy projects almost entirely, the exception being in the Cost of Production studies.

**FERTILIZERS**

The fertilizer projects as reported in 1920 have been continued with no change. Organic matter in addition to cottonseed meal and acid phosphate, gave twice the yield in continuous corn cultivation as did the same materials without organic matter. Velvet beans in a two year rotation of cotton, oats and legumes, gave a larger yield of cotton than did either soybeans or cowpeas. Soybeans in corn,
followed by cotton, in a two year rotation of corn and cotton produced considerably more cotton than adjoining plats given over to the same rotation without soybeans. Continuous cotton cultivation did not make enough to pay for the picking. Oats continued to give a good yield in both plats where this crop is grown every year, followed by soybeans in the summer.

CROP PRODUCTION

Breeding and selection was continued with cotton, corn and oats. Mass selection was continued with the long staple cotton (Louisiana No. 1) but pedigreed breeding will be done in 1922. The results have been very gratifying and it is hoped that more attention given to this new variety will bring us to a point, in a few years, when it may be tried out over the State.

The Louisiana Hybrid 143, and Alex wilt-resistant have continued to be as promising, particularly in plats where the cotton wilt is present.

The yellow color in Calhoun Red Cob corn has been perfected. The hand pollinated corn of 1920 produced an exceptionally good yellow corn this past season. The work of producing a white cob in the White Calhoun corn is progressing favorably.

Breeding for a deep pinched dent and rather broad kernel in corn has been started. This kernel breeding is one of the most important projects in the corn work.

The oat nursery has been decidedly enlarged. Twelve hundred individual oat plants were selected during the harvest and were planted in the fall of 1921. Some very noticeable variations can be seen at the present time (December 1921). Twenty-five of the selections made in 1919 were worthy of further propagation.

Variety tests of oats, cotton and corn have been continued, as usual. Different varieties of cowpeas and soybeans are being planted for grain as well as for hay. The following new variety tests have been added: Sorghum, sugar beets, wheat, barley and rye.

This past season the six varieties of sugar beets produced a tonnage of nearly 20, with a sucrose content of 14
and a purity of 85. This was considered very good and the same varieties are being planted again.

Leaf spot attacked the barley and caused it to fail. Different methods of cultivation have been started with corn. The same kinds of implements are used that one will find on various farms over the State. Other work on corn is to determine the effect of strength of germination upon the yield, and effect of time of planting upon the yield.

The planting of velvet beans in the same row as the corn, in every other row, and in every third row, is being continued. The yield of beans and corn has been considerably larger where both were planted in the same row, and no greater damage has been noticed in the corn.

In cooperation with several other southern experiment stations, "place effect" work in cotton was started this year.

The alfalfa breeding has been continued as mentioned in 1920 report.

COST OF PRODUCTION STUDIES

Keeping an accurate account of the cost of producing hog-grazing crops together with the cost of growing hogs, has given some very good data. Final results are obtained after hogs have gathered the different crops in the various plats.

STATION NO. 3
North Louisiana Experiment Station, Calhoun.
C. D. Cain, Ass't. Director in Charge.

The only new work added this year was a Place Effect test with different varieties of cotton, and a test of Weevil-nip. The samples of cotton from the Place Effect plats were sent to Professor A. F. Kidder of the State Station, and he sent them to the Alabama Experiment Station for comparison and study.

The Three Year Rotation Experiment where compost (made of cottonseed, stable manure and acid phosphate) was used, shows clearly that it is essential to have organic matter in the sandy soil of North Louisiana, in order to get
favorable results with commercial fertilizer. The analysis of the compost used in the experiment was as follows:

<table>
<thead>
<tr>
<th>Corn Compost</th>
<th>Cotton Compost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available phosphoric acid</td>
<td>5.85%</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>1.42</td>
</tr>
<tr>
<td>Potash</td>
<td>1.28</td>
</tr>
</tbody>
</table>

The plats where compost has been used for a long time gave more than twice the yields in cotton, corn, oats, and pea vine hay of plats where commercial fertilizer was used alone.

In the fertilizer experiment where commercial fertilizer was used in connection with stable manure (6 tons of stable manure, 8 lbs. of nitrogen in cottonseed meal, 32 lbs. $\text{P}_2\text{O}_5$ in acid phosphate, 8 lbs. $\text{K}_2\text{O}$ in potassium sulphate), the yield of cotton was increased about 15% over plats where stable manure alone was used.

With corn, stable manure seems to be the most essential need for the sandy hill sections. With oats, a top dressing of 50 lbs. of sodium nitrate applied when the oats first came up, increased the yield of grain 20%.

The experiments with varieties of corn showed that the prolific varieties gave a little higher yield than the other varieties. Calhoun Red Cob seems to be one of the best varieties that we have.

Cotton variety tests showed that there are several varieties that have made good yields at this Station, such as Cleveland's Big Boll, Tir-Cook, Dixie Triumph, Allen's Cleveland, Wannamaker's Cleveland, Delta Type Webber 8985, Webber 49-4 and Express.

In the variety tests of soy beans, the largest yields for hay were made by Arlington and Virginia. They also seem to yield the largest amount of grain of any of the new varieties tried at this Station.

Grazing hogs on corn and soybeans gave 667.67 lbs. of pork per acre. The yield of beans was not estimated, but the corn supplemented by the beans gave 15.67 lbs. of pork for every bushel of corn. Where cowpeas were substituted for the soybeans in the grazing experiment, 12.3 lbs. of pork was obtained per bushel of corn.
We have threshed 322 bushels of velvet beans and 66 bushels of peas for the farmers in the community, on the Star Pea and Bean Huller that was purchased in 1919. This has encouraged more farmers to take an interest in these legumes and has enabled them to get them on the market.

In order to get a general idea of the milking capacity of some of our grade Shorthorns, the following records for two months period are given:

**Half Shorthorn**
(White)
Dropped calf June 8.
August 1921: 784 lbs. milk or average of 2.94 gallons. Feed: Pasture and 10 lbs. molasses mixed feed per day.
September 1921: 716.75 lbs. of milk or average of 2.78 gallons of milk per day. Feed same as in August.

**Half Shorthorn**
(Trindle)
Dropped calf in March.
April 1921: Average per day 1.74 gallons.
May 1921: Average per day 1.89.
Feed: 2 lbs. C. S. hulls; 3 lbs. Velvet bean hulls and ½ lb. C. S. meal.

**NORTH LOUISIANA AGRICULTURAL SOCIETY**

Monthly meetings of the North Louisiana Agricultural Society were held from March to October, inclusive. Greater interest was shown in the meetings this year on account of the preparations for the fair, which was held in October 19-20-21. Considering the fact that the fair had not been held at Calhoun since 1916, and also the financial condition of the community and the condition of the roads at the time of the fair, the exhibits were very creditable.

**STATION NO. 4**

Rice Experiment Station, Crowley, La.
J. M. Jenkins, Superintendent in Charge.

Conducted in cooperation with the Bureau of Plant Industry, United States Department of Agriculture.

The following list of projects comprise the experimental work at this Station:

- Work with rice varieties:
  - Under irrigation and under dry cultivation.
  - Nursery studies, covering several hundred.
  - Testing under field conditions on 1-10 acre basis.
  - Distribution, and study of promising varieties in co-opera-
    with farmers.
Cultural experiments:
  Date of seeding.
  Rate of seeding.
  Manner of seeding.
  Character of seed bed.
Irrigation experiments:
  Date of application of irrigation water.
  Depth of application of irrigation water.
  Daily loss of water at different depths in plats.
  Daily loss of water in tanks.
Fertilizer experiments:
  Sources of nitrogen.
  Sources of phosphoric acid.
  Application of lime.
  Application of potash.
  Application of manure.
  Application of complete fertilizers.
Rotation experiments:
  Two-year with rice and soybeans.
  Two-year with rice and pasture.
  Four-year with rice, oats, corn, and soybeans.
Diseases of rice:
  "Straighthead."
Meteorological data:
  Evaporation.
  Precipitation.
  Wind velocity.
  Daily temperature, maximum and minimum; Humidity.

The accumulating results obtained in most of the projects are rather conclusive, and give evidence of definite information for the benefit of the rice industry in general. This is especially true in the matter of new varieties, cultural, fertilizer, rotation experiments, and investigations pertaining to straighthead. The demand for seed rice varieties introduced by the Station, was much in excess of the supply. Millers are showing a readiness to buy these varieties. This has stimulated their popularity very much.

The Station has distributed soybeans as in the past. During this year, a great interest was shown by local farmers and if the price of rice remains low, the evidences are that soybeans will become, in course of time, a regular crop on the rice farm.

The Bureau of Entomology of the United States Department of Agriculture is cooperating with the Station and has placed a permanent representative here to devote his entire time to a study of insects affecting rice.
During the year, the Pathologist employed by the National department, to investigate rice diseases, was transferred to other lines of work, leaving the Station again without one directly responsible for this line of work.

A preliminary report on some of this work was made in the form of a Farmer's Bulletin, issued by the Office of Cereal Investigations, with the Pathologist in charge and the Station Superintendent as joint authors. This bulletin is entitled "Straighthead of Rice and Its Control."

In place of a general assistant, a stenographer was appointed for this Station, assuming her duties January 1, 1921.

There were no new buildings erected or any notable equipment added during the year, save the purchase of a Ford sedan for the use of the Station.

We lost one horse during the year, which reduced our live-stock to four mules and one horse.

Representatives from foreign countries continue to visit this Station in search of information that might be of value in their respective countries. During the year we had four from Brazil, three from Japan, three from China, and one from the Phillipine Islands.

DEPARTMENT OF PLANT PATHOLOGY

Baton Rouge,
C. W. Edgerton, Pathologist in Charge.
C. C. Moreland, Assistant.

During 1921, the work in the Department of Plant Pathology was, in general, along the same lines as in previous years. Most of the available time was concentrated on a few definite projects though some attention was given to other important problems of the State. The work was set back to a considerable extent by the fire which destroyed the Experiment Station laboratory in November. Records of much of the work were destroyed. Fortunately, a portion of the results on some of the projects had been written up and published in bulletin form during the year.

SUGAR CANE DISEASES.

The investigations on sugar cane diseases have dealt largely with the mosaic diseases. A number of trips were
made through the sugar belt and data on the spread of the disease were obtained. The disease is now present in practically all parts of the sugar belt. Traces of it appeared in the Bayou Teche region during the spring and by fall the disease was rather common in that region. This is the latest region to become affected.

At Audubon Park a number of experiments on this disease were carried on during the season. The object was to determine the relative resistance of the different varieties and to study the effect of the disease on the same cane from year to year. A special study was also made of the L 511 cane. This cane is specially resistant to the mosaic disease but unfortunately the past season has not given as high yields as was hoped for. The method of selecting disease free stalks of this variety for planting purposes worked very successfully, not only at Audubon Park but also on several plantations in the State. Some investigations on the mosaic on corn were also started.

TOMATO WILT

A three years' test of the effect of the wilt disease on various tomato varieties and selections was brought to a close and the results published in bulletin form. The wilt-resistant selections which have been developed at the Experiment Station have given the most satisfactory results on wilt-infested soils. These selections have been sent out over the State and are being used more and more each year. There is a very heavy call for this seed from various parts of the State. During the past season the Horticultural Department grew several pounds of this seed and this is being distributed for planting in 1922.

EGGPLANT BLIGHT

The results on the work on the eggplant blight were published in bulletin form during the early part of the year. The work itself was discontinued at the end of the preceding season.

CORN DISEASES

The work on the corn diseases that are present in the State has developed along several lines. Hundreds of cul-
tures of fungi have been isolated from seed corn and corn plants. Furthermore, corn seed known to be affected with certain organisms has been used in field trials. Data including the condition of the corn, the presence of various root rott ing organisms and the germination were obtained in order to compare with the actual results obtained in the field. Unfortunately, most of the data obtained were lost in the fire. This work will be continued on a larger scale during the season of 1922.

Also during the year, some seed treatment experiments and some hybridization experiments between resistant and non-resistant strains were started. The hybrid corn obtained was destroyed by the fire and this work will have to be duplicated.

OTHER WORK

Some cooperative work was carried on with the Horticultural Department on the mosaic disease of Irish potatoes. Notes were taken on the behavior of various lots of certified seed which were tried in the State. A preliminary bulletin on this work was published during the year.

Investigations on an onion disease which causes a heavy loss in Lafourche and adjoining parishes was brought to a close and the results were published in bulletin form. This work was started in cooperation with the Bureau of Entomology and the Extension Division but was later turned over entirely to the Department of Plant Pathology.

The Plant Disease Survey work was continued during the year. This work is in cooperation with the Plant Disease Survey of the U. S. Bureau of Plant Industry.

DEPARTMENT OF ANIMAL PATHOLOGY
Baton Rouge

DIVISION OF BACTERIOLOGY.
Harry Morris, Bacteriologist and Veterinarian in Charge.

The work in the Division of Bacteriology during 1921 was, in general, continued along lines previously reported, consisting of investigations of some of the important animal diseases of the State. Practically all material carrying cultures, and laboratory records were lost in the Experiment Station fire, November 3, nevertheless, it is pos-
possible to draw from memory, some conclusions from the accumulated data gained from experiments concerning the life history of the micro-organism of anthrax.

(1). Anthrax bacilli remained virulent for guinea pigs for a period of twelve years while suspended in water taken from the University Lake.

(2). Anthrax remained virulent in milk for a period of ten years. This specimen of milk had been taken from the udder of a cow that died of anthrax ten years ago.

(3). Anthrax spores remained virulent for a period of nine years in dog feces. The dog had been fed virulent anthrax spores, feces collected in glass jar retainers and examined once a year.

(4). Commercial anthrax (spore) vaccine had been collected in the laboratory for some four years. In the majority of samples, the virulence of the spores did not seem to be reduced by age.

Soil samples were collected from the garden during the year 1919 and inoculated with anthrax spores. The samples were placed in the incubator at a temperature of 37.5°C and enough water to thoroughly moisten the soil was added every six weeks. The continued heat and dessication did not seem to affect the organism, as virulent anthrax could be isolated at the conclusion of the experiment.

Concerning the examination of blood smear for anthrax.

(a). A dried blood smear is not suitable material for making cultures or animal inoculations, as the vegetative form of anthrax is soon killed by drying. Negative results should not be taken as conclusive evidence that the blood was not taken from a charbonous carcass.

(b). Negative results obtained from cultures made from decomposed blood or flesh are not conclusive evidence for making a negative diagnosis. The vegetative form of anthrax is destroyed by decomposition.

(c). In making a positive diagnosis of anthrax from a stained blood smear some of the micro-organisms should always show a capsule formation. The organisms resembling anthrax found in the blood do not show capsule formation.
During the summer months anthrax developed in some of the parishes in the northern part of the State. The disease seemed to occur to a great extent among horses and mules; the loss among cattle was very small. Observations of the outbreak would indicate that the infection was probably due to blood-sucking insects, as only the thin-skinned animals were affected. No serious outbreaks of the disease were reported from the southern part of the State.

The usual number of specimens were received at the laboratory for examination. A great many of the blood smears sent in to be examined for anthrax had been taken from carcasses dead of Texas fever.

By the continued use of anthrax vaccine and observing the common rules of sanitation, the Station passed the tenth year without a case of anthrax among the live stock.

**SWINE DISEASES**

A study of the diseases of swine other than hog cholera, has been continued. Infectious colitis has been found in several herds. The cause of the disease is not known but unsanitary surroundings always accompany the disease. Hemorrhagic septicemia has not been found in swine, although several outbreaks of the disease were reported and specimens were sent to the laboratory for examination.

**INFECTIONOUS ABORTION IN CATTLE**

Infectious abortion in Guinea pigs was given some study. Arthritis, orchitis, sterility and abscess formation in the orbital cavity with complete destruction of the eye ball was noted. Specimens, notes and photographs were all destroyed in the fire of November 3.

Through the excellent work of the Superintendent of the Dairy, infectious abortion continues to be held in check, with the loss of very few calves, although during 1919 the loss was nearly one hundred per cent. In this control work on abortion the rules of sanitation have been followed as closely as possible and no medical remedies used.

**INFECTIONOUS DIARRHEA OF CATTLE**

A study of infectious diarrhea of cattle was continued during the past year. Protozoa were grown on culture me-
dia and fed to calves and smaller animals with negative results. Outbreaks of the disease in the State were observed and the sick animals treated with intestinal antiseptics. Recovery was rapid with the disappearance of the protozoa from the feces of the infested animal.

DIVISION OF PARASITOLOGY
Dr. G. Dikmans.

The work in animal parasitology has proceeded along the lines indicated when the work was first begun. During the year frequent visits were made to the Baton Rouge Municipal Abattoir for the purpose of obtaining material for examination.

Owing to the writer having to hold classes during the college session, the work was considerably interfered with, from the standpoint of the Experiment Station, as he was prevented from making investigation trips throughout the State during that period. Besides, there was a delay in obtaining some of the needed apparatus. However, his vacation period, during parts of August and September was spent in Washington, D. C., at the laboratories of the Zoological Division of the Federal Bureau of Animal Industry, through the courtesy of the Chief of the Division, in order to study some of the material in the Washington collection of animal parasites, and to obtain some assistance in the identification of some parasites collected locally. The results of the work accomplished at Washington were published as Bulletin No. 183, of the Louisiana Experiment Station, requests for which have been numerous since its publication.

The description of a new species of stomach worm reported from South America and Europe but heretofore not found in the United States, is given in the bulletin referred to.

The examination of material collected locally from calf stomachs is proceeding as rapidly as possible, and a report on this phase of the work will be made in the near future. Later a study of the intermediate hosts of different parasites will be made, followed by practical tests for control measures.
The sequence of the work on parasitology, therefore, which has been commenced and will be followed, is: (1) The identification of the internal parasites of our domesticated animals; (2) their classification; (3) an investigation of their intermediate hosts—some of which have not yet been discovered; and (4) control measures for each species or variety.

DEPARTMENT OF ENTOMOLOGY
Baton Rouge.
Thos. H. Jones, Entomologist in Charge.
W. G. Bradley, Assistant.

The research work during the year 1921 was confined to the following insects:

INSECTS INJURIOUS TO CORN

The Southern corn root worm or budworm. Observations were made on the life history and habits of this insect and, in cooperation with the Agronomist of State Station, Baton Rouge, and the Assistant Director, in charge of the Sugar Experiment Station, New Orleans, planting of corn were made at intervals during the spring of 1921, to ascertain whether time of planting had any bearing on the degree of infestation. At the State Station, Baton Rouge, experiments were also conducted to ascertain whether certain substances applied to corn seed at planting time were of value in reducing injury.

The rice weevil or black weevil. Observations were made on various types of corn cribs built in the State, with the idea of giving satisfactory conditions for storage and for fumigating the contents with carbon disulphid for the control of the weevil and other insects that injure corn in storage. Information concerning the construction of these cribs, and their value as containers for storing and fumigating corn, was obtained.

INSECTS INJURIOUS TO LIVE STOCK

Horse flies and deer flies. Progress was made, by means of collections and observations in the field, in ascertaining what species are injurious. Information was also obtained concerning various habits of some species in the larval and adult stage.
The collection of injurious insects particularly those of Louisiana, used both for display purposes and in connection with the identifications of insect material sent in by correspondents, was considerably increased. In this work special attention was given to the scale insects, concerning which numerous requests for information as to control are received.

Numerous letters, asking for information relative to various insects, have been received and answered. A number of articles concerning some of the more important insect pests have been given to the press and two extension circulars, one having to do with the grassworm and one with the webworm, have been published.

The cooperative work with the Bureau of Entomology, United States Department of Agriculture, on truck crop insects, begun in 1914, has been continued, C. E. Smith of the Bureau of Entomology being stationed at Baton Rouge during 1921 in connection with this work.

The Department, as well as the Bureau of Entomology, United States Department of Agriculture, lost all of its equipment including apparatus, specimens, notes, and literature, kept in the building occupied by the Experiment Station laboratories when this building was destroyed by fire on November 3, 1921.

HORTICULTURAL DEPARTMENT
Baton Rouge,

G. L. Tiebout, Horticulturist in Charge,
R. W. Axt, Assistant.

The leader in horticulture divides his time between Experiment Station and Extension work. An assistant, Mr. R. W. Axt, was appointed March 1, 1921.

The Legislature of 1920 authorized the establishment of a branch experiment station in the Florida Parishes. Arrangements have been concluded for the location of this station, near Hammond, La., the center of the strawberry-producing territory and a large truck-growing section. The Parish of Tangipahoa is providing the farm and permanent improvements and the Experiment Stations will operate it from the general funds appropriated for the Stations.
The people of the Seventh and Eighth Wards of Tangipahoa Parish have voted a tax of one-quarter mill for three years, as a bonus for helping to properly get this work under way.

**IRISH POTATO SEED IMPROVEMENT**

The object of this investigation, in cooperation with the United States Department of Agriculture, is to determine the actual value or superiority of certified or inspected seed stock over uncertified or uninspected stock as ordinarily offered to the southern grower by the seed dealers in his community.

Five lots of certified Triumph seed were furnished from Wisconsin and six lots from Nebraska. These were planted with five lots of uncertified Triumph seed purchased from dealers at four Louisiana seed-distributing centers. The season was favorable and the average yield of certified over uncertified seed was very marked. Ten out of the eleven lots of certified seed were good and several very superior. One lot was a decidedly low yielder, showing 98.9% mosaic disease infection. Four out of five of the uncertified lots were inferior. On the whole, the results showed a decided superiority of the certified over the uncertified seed.

The mosaic disease appears to be the greatest menace to Triumph potato production in the South. Information to date would indicate that this disease develops to a much greater degree in the South than in the northern potato seed-producing areas. High certification standards, especially with regard to this disease, must be maintained in order to give reasonable protection to the Triumph potato grower in the South. The seed improvement work has been in progress in Louisiana for three years. Experiment Station Bulletin No. 181, "The Mosaic Disease of the Irish potato and the Use of Certified Potato Seed," was issued during the past year.

**LOUISIANA CREOLE ONION IMPROVEMENT.**

Our Louisiana Creole onion, so exclusively grown in the southern part of the State, is sadly in need of improve-
ment, as casual inspection of commercial lots would indicate. Improvement by selection for uniformity in size, color, shape, maturity, and other desirable characteristics, was begun this year. Selections were made from flowering bulbs and twenty-three lots of seed were saved for planting the following fall.

VARIETY TESTS OF ANNUAL FLOWERS.

A total of ninety-six varieties of fifty-five different kinds of annual flowers were planted during the spring for observations as to season, blooming period, color, use, etc. Information as to annual flowers of easy culture, best suited for farmstead ornamentation in this State is sought. The exceptionally late spring and the unusually hot summer that prevailed, more than likely caused considerable variation in results.

PRODUCTION OF SEED OF WILT RESISTANT TOMATOES FOR DISTRIBUTION AMONG FARMERS.

About eight pounds of seed of the Station’s Louisiana Red, Louisiana Pink and the Norton, were harvested for distribution. Recipients of small amounts of this seed will be required to sign a pledge that they will save their own supply in the future. It is hoped that some commercial seed grower will undertake the production of seed of these wilt-resistant varieties introduced by the Station so that the seed can be offered through the usual trade channels.

RHUBARB AND SWEET CORN FOR THE HOME GARDEN

Work with rhubarb to determine the total yield, number of pullings, and length of season from one-year old Linnaeus seedling roots from the North was continued. Results show that the rhubarb roots are not perennial here under normal exposure. The heat of late spring and early summer appears to be primarily responsible for the destruction of the roots. The yield indicates that rhubarb can be successfully produced by importing roots each season.

The experiments with sweet corn embracing two varieties, Howling Mob and Stowell’s Evergreen, for home
garden, are still under way. Successional planting periods, yield, earliness and thinning distances are points under observation. Results indicate that good strains of certain varieties of sweet corn can be grown with good results in home gardens over an extended period. The results are contrary to the prevailing opinion that sweet corn cannot be grown in this section. Observations show that the corn earworm, for which no satisfactory methods of control have been found, is a very menacing factor. The worm, however, usually leaves a liberal supply for family consumption.

Field and greenhouse, for the cooperative work of the Bureau of Entomology of the United States Department of Agriculture, as well as for the Department of Plant Pathology, of the Experiment Stations, have been furnished and the usual routine work incident to maintenance and progress has received attention.

**EXPERIMENT STATION DAIRY**

Baton Rouge.

R. C. Calloway, Superintendent.

Herd improvement, experiments in feeding dairy cattle, growing feed crops, soil improvement, and a few other minor operations go to make up the essential work of the Dairy.

The herd was managed in practically the same way as it had been in previous years. It has been gradually improved by the use of better sires and through the Register of Merit and herd record work. Seventeen cows in the herd have register of merit records. One Jersey cow in the herd has recently completed a record of 603 pounds of fat and 12,084.9 pounds of milk. She was bred and developed at the Dairy Farm.

During the year, 8 females and 6 bulls were sold, and three were lost by accident. These, 17 in all, represent the number raised or replaced in the herd for the year, since the number in the herd at present, is the same as last year.

Only four abortions occurred in the herd during the year and it is reasonable to presume that the disease is fairly under good control.
FEEDING EXPERIMENTS

The two experiments that were begun last year were completed.

(1). The feeding of Blackstrap molasses to young calves was completed in February. From this experiment it was concluded that sugar cane molasses is not laxative when fed with grain. Besides being nutritious in itself, it is a good appetizer, has a tonic effect, tends to make the grain more palatable, thereby causing the calves to consume larger quantities of grain and drink larger quantities of water. It is an excellent conditioner for calves, regulates the bowels and improves the quality of the skin and hair.

In conducting this experiment, it was an easy matter to compute the cost of raising the calves. The average cost of raising a calf to six months of age without molasses was $64.00 and with molasses, $54.00. However, the object of this experiment was to test the physical effect of the Blackstrap molasses and not the commercial feeding of calves.

(2). Rough rice as a feed for dairy cows.

The chief object of this test was also to find out if any injurious effects would result from the feeding of ground rough rice to milk cows. The concentrates used in this mixture consisted of 80% rough rice which was ground into a coarse meal. This mixture was fed 60 days, plus the preliminary period, and with no ill effects whatever, that could be observed, on the digestive organs of the animal.

The test ran for 60 days. The average daily ration consumed by the six cows receiving corn meal, cottonseed meal and wheat bran was 10.4 pounds. That consumed by the six cows fed rough rice and cottonseed meal was 9.7 pounds. The average daily milk yield per cow, during the 60 day period, in the group receiving corn meal, cottonseed meal and wheat bran, was 24.5 pounds. That of the group getting rough rice and cottonseed meal, was 22.5 pounds. Owing to the palatability of the rice mixture, it is reasonable to presume that if the animal had eaten as much of the rice mixture as of the corn mixture, the milk yield might have been as much in one case as in the other.
“Pifine” meal vs. alfalfa hay when mixed with molasses:

“Pifine” meal is a product of Paille Fine grass, which grows in large quantities along the Gulf coast marshes. The grass is cut, sunned, ground, dried in steam rolls, and mixed with molasses. The Paille Fine, after it is dried, is a great molasses carrier, as it will absorb as much as 70% of its weight of molasses. So far, in this test, the results obtained are very gratifying when compared with alfalfa.

CROPS

The feed crops grown on the Dairy farm consisted mainly of hay, root crops, some grain, silage and green oats for winter pasture. The acre of alfalfa that was planted in February, 1920, was allowed to stand the second year. The alfalfa was cut four times and yielded about 4 tons of well cured hay, making 9 tons in the two years. In September, the ground was plowed and prepared for root crops. One-half was sown in stock beets, one-fourth in rutabagas and the other one-fourth in purple top turnips. The seed were sown in October and in December the turnips were ready to be fed. They yielded at the rate of 14 tons per acre.

Seven tons of oat hay were harvested after the oats had been grazed until March 1. Eight hundred bales of mixed hay, lespedeza and grass were saved.

The grain crops consisted of corn, soy beans, and velvet beans. The corn was harvested and saved for the work stock, while the soybeans and velvet beans were left in the field to be harvested by the cattle.

The silage crop consisted of corn and Biloxi soybeans; 12 acres averaged 10.7 tons per acre. The 12 acres after silage, were sown in oats in September for winter pasture. We began pasturing the oats in the latter part of November.

SOIL IMPROVEMENT

All the manure that could possibly be saved for the past six years, has been applied on two fields. These two
fields have improved wonderfully in production over fields that have had no manure. Other fields have been improved by the use of leguminous crops.

STATE FAIR EXHIBITS.

One of the most important demonstrations that the Dairy supervised, was the demonstration at the State Fair, of the profitable and unprofitable dairy cows. Two cows that were bred and developed at the Dairy farm, and of which records of their production had been kept, were selected for this demonstration. For each cow a chart was made out, which gave the amount of feed consumed, the quantity and value of products returned, and the profits derived when both whole milk and butter were sold. This demonstration attracted the attention of a great many visitors to the Fair and it was felt by those who originated the idea and installed the exhibit that a great deal was accomplished towards eliminating the unprofitable cow from the dairy herds in Louisiana.

DEPARTMENT OF EXHIBITS
A. A. Ormsby, Specialist in Charge.

In the interest of the State Experiment Stations during the year 1921, several visits were made by Mr. Ormsby to the Stations at Crowley, Audubon Park and Calhoun, as well as to be the Iberia Live Stock Farm at Jeanerette, for the purpose of investigating the work of the various stations and assisting the superintendents in charge in the selection and preparation of material for exhibition purposes.

With an appropriation of approximately $300, a joint exhibit of the activities of all four of the experiment stations was made at the State Fair of Louisiana in October. This exhibit covered a floor area of about 600 square feet, with an equal amount of wall space, showing results that have been accomplished by the Experiment Stations and recommending better methods of farming and live stock raising.

In cooperation with the Louisiana State University, the State Department of Agriculture and the State Department
of Conservation, the Experiment Stations joined in extensive exhibits of agricultural products and natural resources at the Illinois State Fair, Springfield, Ill., August 19-27; at Wisconsin State Fair, Milwaukee, August 29 to Sept. 3; and at the International Live Stock Exposition, Chicago, Ill., November 26 to December 3, inclusive. The total attendance at these three large expositions exceeded 1,000,000 persons.

The Department of Fairs and Exhibits is maintained jointly by the State Experiment Stations, the Louisiana State University and the State Department of Agriculture.

FERTILIZER AND FEED STUFFS LABORATORY
Baton Rouge.
A. P. Kerr, Chief Chemist.

The fiscal year for the Feed and Fertilizer laboratory ended August 31, 1921. A total of 2138 feeds and 1900 fertilizers samples were reported to the Chief Inspector as official analyses. In addition to these, miscellaneous analyses of feeds, fertilizers, soils, poisons, waters, minerals, etc., which would make a total of approximately 4500 analyses, were made.

The personnel of the laboratory was unchanged with the exception of the addition of J. L. Farr, M. S., L. S. U., 1921, as Assistant Chemist, to replace E. C. Thomas, M. S., L. S. U., 1919, who resigned to accept a position with the Hawaiian Sugar Planters' Association, located at Honolulu.

Due to the disastrous fire that destroyed the laboratory on November 3, a number of valuable records pertaining to soil, feed and fertilizer analyses were lost. These records took years to accumulate and are practically irreplacable.

The laboratory is now located in the old band hall, adjacent to the river, just north of the barracks buildings. While the equipment is not as complete as before, the laboratory is more compact and up-to-date and capable of turning out a larger amount of work than before.

PUBLICATIONS

The following publications were issued during the year:

Experiment Station Bulletins:
No. 179—Feeding Rough Rice to Horses, Mules, Hogs and Dairy Cattle.
No. 180—Feeding Blackstrap Molasses to Calves, by R. C. Calloway.
No. 182—Onion Diseases and Onion Seed Production, by C. W. Edgerton.
No. 183—Preliminary Notes on Parasites Found in Ruminants, by G. Dikmans.

Annual Report Series:
Annual Report of Agricultural Experiment Stations for 1920.

FINANCIAL STATEMENT
HATCH AND ADAMS FUNDS

<table>
<thead>
<tr>
<th>Description</th>
<th>Hatch Fund</th>
<th>Adams Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receipts from the Treasurer of the United States, as per appropriations for the fiscal year ended June 30, 1921 under acts of Congress approved March 2, 1887 (Hatch Fund) and March 16, 1906, (Adams Fund)</td>
<td>$15,000.00</td>
<td>$15,000.00</td>
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<tr>
<th>Dr.</th>
<th>Hatch Fund</th>
<th>Adams Fund</th>
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<tbody>
<tr>
<td>By Salaries</td>
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<td>$9,574.35</td>
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<tr>
<td>Labor</td>
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<td>Publications</td>
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<tr>
<td>Postage and Stationery</td>
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<td>Freight and Express</td>
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<td>Heat, Light, Water and Power</td>
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<td>Chemicals and Laboratory Supplies</td>
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<tr>
<td>Seeds, Plants and Sundry Supplies</td>
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<tr>
<td>Fertilizers</td>
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<tr>
<td>Feeding Stuffs</td>
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<td>Library</td>
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<tr>
<td>Tools, Machinery and Appliances</td>
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<td>15.97</td>
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<td>Furniture and Fixtures</td>
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<tr>
<td>Scientific Apparatus and Specimens</td>
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<tr>
<td>Traveling Expenses</td>
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<td>454.08</td>
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<tr>
<td>Contingent Expenses</td>
<td>726.03</td>
<td>10.17</td>
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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, 1921 to December 31, 1921.

## Receipts

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>State Appropriation</td>
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<td>Refunds</td>
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<tr>
<td>Interest on Daily Balance for six months</td>
<td>131.81</td>
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<tr>
<td>Sales</td>
<td>6,466.93</td>
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<tr>
<td>Loan from Evangeline Bank &amp; Trust Co.</td>
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<tr>
<td>Springfield Insurance Company</td>
<td>2,350.00</td>
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<tr>
<td>Phoenix Insurance Company</td>
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<td>Northern Insurance Company</td>
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<td>Balance on Hand, January 1, 1921</td>
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<td><strong>Total</strong></td>
<td><strong>$77,487.83</strong></td>
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## Expenditures

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<td>Postage and Stationery</td>
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<td>Freight and Express</td>
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<td>Chemical Supplies</td>
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<td>Seeds and Sundries</td>
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<td>Fertilizers</td>
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<td>Feed Stuffs</td>
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<td>Library</td>
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<td>Tools, Implements and Machinery</td>
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<td>Furniture and Fixtures</td>
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<td>Scientific Apparatus</td>
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<td>Live Stock</td>
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<td>Traveling Expenses</td>
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<td>Contingent Expenses</td>
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<td>Building and Repairs</td>
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<td><strong>Total</strong></td>
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<tr>
<td>Transferred to Fertilizer and Feed Stuffs Fund, for insurance on chemicals and apparatus</td>
<td>7,000.00</td>
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<tr>
<td><strong>Balance on Hand December 31, 1921</strong></td>
<td><strong>$71,665.33</strong></td>
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# FERTILIZER AND FEED STUFFS FUND

Statement of Receipts and Expenditures of the Fertilizer and Feed Stuffs Fund from January 1, 1921 to December 31, 1921.

## Receipts

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Harry D. Wilson, Commissioner of Agriculture</td>
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<td>Refunds</td>
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<td>Transferred from State Fund for Insurance collected on Chemicals and Apparatus, Destroyed by Fire Nov. 3, 1921</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$33,403.59</strong></td>
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</table>
**Expenditures**

- Salaries: $16,021.74
- Labor: 2,558.00
- Publications: 217.15
- Postage and Stationery: 788.87
- Freight and Express: 136.81
- Heat, Light and Water: 970.67
- Chemical Supplies: 1,654.95
- Seeds and Sundries: 313.42
- Fertilizers: 496.85
- Library: 33.31
- Furniture and Fixtures: 1,021.60
- Scientific Apparatus: 749.60
- Traveling Expenses: 220.06
- Contingent Expenses: 25.00
- Building and Repairs: 1,447.24

**Total**: $26,655.27

**Balance on Hand December 31, 1921**: 6,748.32

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**EXPERIMENT STATION DAIRY FUND**

Statement of Receipts and Expenditures of the Experiment Station Dairy Fund from January 1, 1921 to December 31, 1921.

**Receipts**

- Sale of Milk: $5,284.44
- Sale of Live Stock: 2,316.60
- Miscellaneous Sales and Refunds: 179.17
- Balance on hand January 1, 1921: 133.84

**Total**: $7,914.05

**Expenditures**

- Labor: $3,058.89
- Seeds and Sundries: 1,272.24
- Feeds: 1,875.56
- Tools, Implements and Machinery: 130.12
- Live Stock: 1,150.00
- Buildings and Repairs: 53.21

**Total**: $7,540.02

**Balance on Hand, December 31, 1921**: 374.03

**$7,914.05**