Annual report of the agricultural experiment stations of the Louisiana State University and Agricultural and Mechanical College for 1926.

William Rufus Dodson

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ANNUAL REPORT

OF THE

AGRICULTURAL EXPERIMENT STATIONS

OF

LOUISIANA STATE UNIVERSITY

AND

AGRICULTURAL AND MECHANICAL COLLEGE

FOR 1926

TO THE GOVERNOR

BY

W. R. DODSON, Director
EXPERIMENT STATION STAFF.

W. R. Dodson, A. B., B. S., Director.
W. G. Taggart, B. S., Assistant Director,
C. W. Edgerton, Ph. D., Plant Pathologist,
Eugene C. Tims, Ph. D., Ass't. Plant Pathologist,
Harry Morris, D. V. M., Bacteriologist and Veterinarian,
Eugene C. Tims, Ph. D., Ass't. Plant Pathologist,
Herbert Spencer, Ph. D., Ass't Entomologist,
B. A. Osterberger, B. S., Assistant in Entomology,
C. L. Stracener, Assistant in Entomology.
Nathalie Poirrier, Stenographer, Dep't. of Entomology.
J. F. Brewster, Ph. D., Research Chemist,
Wm. L. Owen, B. S. Research Bacteriologist,
D. N. Barrow, B. S., Sugar Cane Specialist,
C. B. Gouaux, B. S., Sugar Cane Specialist.
H. J. Rodriguez, B. S., Assistant in Sugar Cane
J. J. Munson, B. S. Sugar Engineering.
C. L. Osterberger, B. S., Farm Machinery.
F. C. Old, B. S., Poultry Specialist.
G. W. Knox, Jr., B. S., Ass't in Poultry.
H. B. Brown, Ph. D. Cotton Breeding.
P. J. Mills, B. S., Ass't. in Plant Pathology.
A. P. Kerr, M. S., Chief Chemist.
W. P. Denson, B. S., Assistant Chemist,
C. C. Moreland, B. S., Assistant Chemist.
J. H. Jolly, B. S., Assistant Chemist.
Jesse L. Farr, M. S., Assistant Chemist.
C. R. Hummel, B. S., In Charge of Records.
Mrs. Ruth Heidelberg, Secretary to the Director.
J. K. McHugh, Librarian.
D. J. DeArensbourg, Farm Overseer.
North Louisiana Experiment Station, Calhoun, La.
Sidney Stewart, B. S., Superintendent.
Rice Experiment Station, Crowley, La.
J. Mitchell Jenkins, B. S., Superintendent.
Helen Andrus, Stenographer.
Fruit and Truck Experiment Station, Hammond, La.
B. Szymoniak, B. S., Horticulturist in Charge.

FINANCIAL STATEMENTS

The financial statements include receipts and expenditures for the calendar year 1926, for all funds. The Federal fiscal year ended June 30, 1926 for Federal funds. That comparisons may readily be made with Federal reports, the receipts and expenditures of all Federal funds have been tabulated for the fiscal year, July 1, 1925 to June 30, 1926.

The books and vouchers have been examined at each period of six months by the Auditor of Public Accounts and reports made to you regarding such audits. The accounts were found to have been correctly kept and proper vouchers accompanying checks representing all expenditures.

A representative of the Office of Experiment Stations, United States Department of Agriculture, Washington, D. C., has audited the accounts also for the Federal Funds, and approved the expenditures for their fiscal year, ending June 30, 1926.

SPECIAL FUNDS

In the spring of 1926, the American Sugar Cane League paid three hundred dollars of the expenses of conducting cane borer investigations, until the special appropriation of the Legislature became available. In order that a full season’s observation might be made it was necessary to begin work before the Legislative Act became effective. While this sum is small in itself, it came at a critical period. Its significance is greater however, in that it was a manifestation of the sugar planters’ desire to see this work go forward without delay.
The American Cyanamid Company established a research scholarship of two thousand dollars a year for two years, for a study of the effect of cyanamid, applied in various ways and in varying amounts to sugar cane and cotton. The supervision of the experiments and the compilation of the data therefrom has been assigned to Dr. C. W. Edgerton, of the Experiment Station Staff. The funds for the scholarship are paid to the Treasurer of the University and are not passed to the Experiment Station account. Land, labor, and plant cane for the experiments conducted here are furnished by the Experiment Station, and a brief summary of the work is here included.

STATE FUND.

The State appropriation for Experiment Stations is for the maintenance of the Rice Experiment Station at Crowley, the Fruit and Truck Experiment Station, at Hammond, the North Louisiana Experiment Station at Calhoun, and the State Station and Sugar Station, at Baton Rouge. This, then, gives about eight thousand dollars, plus the sales, for the maintenance of the work at each Station. The fund is divided approximately equally between them.

Most of the State fund is expended on field tests, laboratory investigations being provided for with funds from the Federal appropriation. There is, of course, some overlapping of work as field experiments are required in some of the strictly technical investigations. There is no necessity for keeping the projects absolutely separate, as the purposes for which the funds are appropriated are similar.

The expenses and salary of Dr. W. E. Hinds are paid from this fund but his report appears elsewhere. Part of the general expense for office work is included under this fund.
Special Appropriation for Sugar Cane Investigations.

The unprecedented ravages of the sugar cane moth borer during the season of 1925, with the increased losses from sugar cane diseases and the very poor condition of the cane crop in the spring of 1926 created an emergency in the cane industry that called for more research work than could be provided for with available funds of the Experiment Stations.

The American Sugar Cane League, the late Governor Henry L. Fuqua, and the President Pro Tem of the Senate, Phillip Gilbert sponsored a bill in the Legislature of 1926, providing additional funds for research work on the cane borer problem, and upon fungus diseases injurious to cane.

A special appropriation of twenty-five thousand dollars for the year 1926-27 and the same amount for 1927-28 was secured. Money from this fund became available July 1, 1926. Anticipating this appropriation, with the approval of Governor Fuqua, we materially enlarged our plants for investigations on the cane borer and cane diseases in the early spring, so as to secure a full season's work on these problems.

An Advisory Committee, to be appointed by the President of the American Sugar Cane League, to work with the Experiment Stations in evolving and executing plans for this work was provided for, in the Appropriation bill. The following sugar planters were appointed to serve on this Committee:

Mr. A. W. Wallace, Cinclare, La., Chairman.
Mr. Chas. Krumbhaar, Houma, La.
Mr. J. Numa Thibaut, Napoleonville, La.
Mr. C. D. Kemper, Franklin, La.

This Committee has been very helpful to the Experiment Station Staff in that they have taken their appointment seriously and have given of their time freely, and
have travelled at their own expense to attend meetings for discussion of the best means of aiding the progress of the investigations agreed upon.

A budget of the funds planned for expenditures for the fiscal year, July 1, 1926 to June 30, 1927 as follows:

- Sugar Cane Moth Borer Investigations: $14,000.00
- Sugar Cane Diseases: 6,000.00
- Extension Work & Test Field Supervision: 5,000.00

Total: $25,000.00

Reports of progress in these several lines of work are given by members of the Staff, under appropriate divisions of this publication.

As the planters are anxious to get all available information on the serious sugar cane problems as soon as possible, I have asked for fuller reports on these activities than are usually given in an Annual Report, which is intended to be a report of progress rather than a compilation of experimental data, that might await further confirmation and final publication in bulletin form.

We believe some real progress is being made toward the broadening of our knowledge of the difficult problems involved, and that this knowledge will be materially helpful in lessening the losses from cane borers and sugar cane diseases, or even in controlling some of these maladies.

With reasonable control over the cane borer, and the use of canes resistant to the diseases that have proven so destructive to the unselected old canes, we should expect restoration of the cane industry to a profitable basis.

**The Sugar House**

The sugar house equipment is now a part of the Department of Mechanical Engineering of the University, available alike for teaching students of Engineering, of the Audubon Sugar School, and for experimental work, or for
use in any other way that it may be made to serve the sugar industry: We probably have here now, the best equipment there is to be had anywhere for general experimental work in sugar house operations, on both sugar cane and sugar beets. Mr. J. J. Munson has kindly prepared, at my request, a statement summarizing the improvements made in the sugar house. This statement by Mr. Munson is here inserted for your information and for historical record.

The following is a report by J. J. Munson on Improvements made in the Sugar House during 1926.

"Since the small sugar house was moved from Audubon Park, New Orleans, to the University property at Baton Rouge, considerable improvements and additions have been made. In fact very little of the equipment that was in the plant at New Orleans was used in the new sugar house at the University. The small double effect evaporator and coil pan together with a few pumps were carefully repaired and placed in service at our new factory.

The following list of equipment was purchased new and has been installed:

2 scales, together with tanks for weighing juice, both from beets and cane.
1 juice receiving tank under scales.
1 Centrifugal pump for pumping juice through heater.
1 horizontal juice heater.
1 lime mixing tank with independent motor drive.
6 carbonatation tanks for clarification of cane and beet juices.
2 juice receiving tanks for filter press pumps.
1 Centrifugal pump for pumping juice through filters.
2 24" plate and frame filter presses.
1 clear juice receiving tank.
1 clear juice pump for pumping to evaporators.
1 triplex syrup pump.
1 syrup tank.
3 compartment molasses tanks.

2 counter-current barometric condensers, one for pan, from Audubon Park and one for double effect evaporator.

1 5 foot coil pan together with condenser and auxiliaries.

1 vertical and 1 horizontal vacuum pumps.

2 Crystallizers, water-jacketed.

1 Hoist arranged on lime kiln tower, consisting of a 5 ton Shepard hoist and wooden car.

1 Tower, which also supports the lime kiln and its platform is of structural steel.

1 Lime Kiln.

2 Weston centrifugals, complete with mixers, etc., Complete sugar handling equipment, consisting of scroll under centrifugal, sugar elevator, and belt carrier.

1 Granulator complete.

1 re-melt Tank for melting low grade sugars.

Complete beet handling equipment, consisting of carriers, and elevator.

1 Beet Washer.

Beet scale.

Beet Slicer of 100 tons daily capacity.

Diffusion Battery, 12 cells, 100 tons capacity.

Pulp flume and pulp carrier for handling exhausted chips.

In addition, a cane elevator has been installed outside over the railroad track for the purpose of transferring cane from wagons to cars. This hoist is electrically operated and has a capacity of 3 tons. It was used during the last season for transferring cane.

A concrete floor has also been installed in the mill room and boiling house. This floor is on the ground level and is completely equipped with floor drains so that the entire lower floor of the sugar house may now be kept in good condition.

There was $10,000 set aside by the Building Commit-
tee for the purpose of moving the Audubon sugar house equipment and installing it here in our new plant. In 1925-26, $27,000 was spent in equipping the sugar house for handling beets. In addition to this, the University set aside approximately $18,000 for the purpose of buying a vacuum pan, centrifugal, granulator, and some other additions that were necessary in order to put the plant in first class condition for making beet sugar. All of this equipment is given in the list above.

Practically all of this money has been spent and the plant is now practically complete. It is expected that from 2000 to 3000 tons of beets will be sliced during the spring.

At present the sugar house is equipped to do most any kind of experimental work. We have already cooperated with the Darco Corp. in making some tests of their char. We have done considerable experimenting on the manufacture of cane table syrup, the results of which are given in a separate report. We will probably work with several other companies making clarification materials in carrying on further tests relative to sugar and syrup manufacture. A number of these companies have already made inquiries as to the extent of our equipment and the possibility of carrying on this work. It is believed that this will not only be beneficial to the sugar and syrup manufacturing concerns of the State, but it will also be a means of giving students valuable instruction while here at the University."

Field Day Meeting at Sugar Station.

Field Day was held July 20, 1926, at the Sugar Experiment Station. More people visited the field plats that day than have ever before been on the Experiment Station grounds in one day. We made no accurate count of the visitors but estimated the attendance at about six hundred,
Cooperation with the Office of Sugar Plant Investigations
(U. S. D. A.)

The cooperation of the United States Department of Agriculture in the introduction of seedling sugar canes has been satisfactory to us. All sugar canes and cane seed introduced into the United States from other countries are kept in hot houses in Washington, D. C., by the United States Department of Agriculture, until it becomes apparent that no new diseases or insect pest accompanies the cane or seed. They are then sent to Canal Point, Florida for preliminary test. Seeds are also produced at Canal Point, Florida, germinated there and grown for a year and those that seem to have merit are sent to the Station here for test, at the same time that they are put on trial at the Government Station, at Southdown plantation, Houma, La.

We contribute from our funds, one thousand dollars a year toward helping to care for the seedlings at Canal Point; this is only a small part of what is spent there in this work.

The Stations are receiving the cooperation of the United States Department of Agriculture in other important projects. We furnish office and laboratory facilities and land and labor for truck crops, for entomological investigations and the United States Department of Agriculture pays the salary of the investigators. C. E. Smith has charge of this work. Similar arrangements are made for corn breeding work. Hugo Stoneberg has charge of this work.

We have made arrangements recently for placing here test areas for the Foreign Seed and Plant Introductions Division of the U. S. Department of Agriculture, in which they will place all new importations that they think may do well here.

Status of the Cane Sugar Industry.

The sugar cane crop of Louisiana, under normal conditions, is worth from thirty to forty million dollars per
year, exclusive of syrup, molasses and bagasse. Crops supplementary to cane produced by cane growers will range from ten million dollars up.

It is conservative to say that the cane sugar industry normally produces from forty to fifty millions of dollars to be expended in the employment of labor, in sustaining local and regional commerce, and in helping to sustain local and state government institutions and public improvements. This year the value of the cane crop slumped to less than ten million dollars. The people of all the State are interested in maintaining the values of taxable property in the sugar territory, and in keeping the regions' population profitably employed, with the least possible interference with the industries of other regions.

It is probable, for instance, that if large areas of cane lands are devoted to rice, the results would be disastrous to the rice industry. Rice growers are, therefore, interested in maintaining cane production. If large areas were to be devoted to growing truck crops, the markets would be over-supplied and few, if any, producers would make expenses. People of the cities are interested in maintaining the markets afforded by the cane plantations. From the standpoint of the public welfare it is good business and good economics to have all the people interested in the speedy restoration of the sugar cane industry, if conditions are such as to warrant the public in having confidence in the safety of a program of restoration. We believe that such a program is offered in the utilization of the new varieties, and selected seed of old varieties of cane; seed cane selection, to be followed yearly, utilization of soy beans turned under as a preparatory crop to plant cane, and limiting cane planting to the better class of soils; the utilization of other soils to pastures, production of forage, etc., with a limited program of trucking, and the elimination of the cattle tick, so that a better quality of cattle may be produced.
There are more than twenty thousand acres of the new canes now planted. There are probably two thousand acres of selected Purple and Striped canes. There should be produced, under normal seasons, from four hundred thousand to five hundred thousand tons of these canes for the fall of 1927. This will be much more than enough to seed all the acreage desired for the crop of 1928, with these canes.

A few of the more forward looking planters, who still have some available reserve resources, are placing dairy cows in the hands of tenants, who are encouraged to develop the dairy industry as a supplement to cane production. We believe this is along the proper lines of diversification; hog and poultry production should accompany dairying.

In many instances, areas of plantations that have been unprofitable, on the average, in cane, could be devoted to beef cattle. Experiments at Baton Rouge and at the Iberia Live Stock Farm of the Federal Government have demonstrated that calves from six to eight months old, bringing top notch prices, can be produced at a low cost where there are no ticks and where good pastures have been established. Pastures of Bermuda grass and white clover on alluvial lands are of exceptional value for cattle grazing. Much of the cane territory is now tick free or nearly so; a few months of efficient work would complete the job.

When these possibilities are all taken into consideration, we think the future of the cane industry is now more promising than it has been at any time within the experience of this generation.

Cotton and Rice Situation: Outlook.

Many cotton growers who work on the tenant system and practice little or no diversification, have lost heavily the past year. The cotton farmers, who raise feed stuffs
and rotate their crops are not in distress, though they have made little money. The depression in the price of cotton, due to a large surplus of this commodity, is responsible for the lack of prosperity of the exclusive cotton territory.

The rice grower is suffering from very much the same trouble as the cotton grower: there is too much rice and the price is not in adjustment with the prices of commodities that the rice grower must purchase.

Here again, it seems that the safest supplement to cotton growing or rice growing will be one or more lines of livestock production, and yet so far as cattle are concerned, the industry is not safe as long as the cattle tick is with us. We are doubtful of the permanent success of any diversified program of general application that does not include the eradication of ticks and the improvement of breeds of livestock. As long as we do not have a diversity of resources on the average farm we will have the greater hazard of recurring periods of depression, such as we are now suffering from.

Miscellaneous

The Director of the Stations was again asked to serve on the Advisory Council of the Agricultural Commission of the American Bankers' Association. No salary or per diem is received, but travel expenses are paid by the American Bankers' Association.

The American Bankers' Association spent thirty-five thousand dollars last year through its Agricultural Commission, mainly in supporting educational work fostered by the Agricultural Colleges.

The Director also continued to serve during the past year as Chairman of the Cotton Production Council of the Association of Southern Agricultural Workers. At a meeting of the Directors of Experiment Stations of eleven principal cotton producing states, and representatives of
the United States Department of Agriculture, arrangements were made for correlating our investigations on the factors influencing the quality of staple of cotton, and to provide for some phases of these investigations not previously cared for by any of the Stations. Such cooperation will result in material economies, provide for a better balanced system of conducting such studies, and promote general interest of the specialists in these lines in correlating findings.

RECORD OFFICE

C. R. Hummel, Charge of Records

In addition to maintaining a complete file of projects carried on by the State Station and the branch stations over the state and a yearly progress report of each, the record office has kept an itemized inventory of all non-expendable property having a replacement value of over one dollar. The inventory is carefully checked each year and all purchases added from the receipted bills. The following recapitulation of the inventories will show the value of all nonexpendable property as of July 1st, 1926, the end of the fiscal year.
### Recapitulation of All Nonexpendable Property Owned by All Branches of the Louisiana Experiment Stations

(As of July 1st, 1926)

<table>
<thead>
<tr>
<th>Department and Location</th>
<th>Livestock</th>
<th>Tools and Implements</th>
<th>Apparatus</th>
<th>Libraries</th>
<th>Furniture and Fixtures</th>
<th>Miscellaneous</th>
<th>Totals</th>
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<td><strong>STATE STATION, Baton Rouge, La.</strong></td>
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<td><strong>Total for State Station</strong></td>
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<td>9,138.05</td>
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**NOTE:** Expendable property not listed on inventory because of such great variability. Automobile tractors and trucks carried as miscellaneous. Library at North Louisiana Station not listed on inventory.
THE NORTH LOUISIANA
EXPERIMENT STATION,
Calhoun, Louisiana
Sidney Stewart, Supt.

GENERAL SUMMARY

The work carried on at this Station the past season consisted of practically the same projects as in 1925, the work consisting mainly of rotation experiments, variety and fertilizer tests with crops suited to this section, more attention being given to cotton and soy beans.

Cotton

An unusually good cotton crop was produced, averaging more than a bale to the acre. On the 29 acres cultivated in cotton was grown and harvested 40500 pounds of cotton, from which 30 bales of lint, averaging 498 pounds, were ginned.

Corn

From 40 acres of corn, 52158 pounds were harvested, producing at the rate of 18.57 bushels per acre. All of the corn had a leguminous crop grown with it, either in the drill, or on a row between the corn rows. On the areas where this plan is followed systematically, the yield per acre is being raised considerably, without the use of heavy applications of nitrogenous fertilizer.

Oats

From five plots of oats harvested, totaling 7.7 acres, 10.59 tons of cured, baled hay was produced, averaging a little more than 1 ½ tons per acre. The best yield was from Plot 2, North of the barns, which had Hairy vetch grown with the oats. This plot yielded at the rate of 2.78 tons per acre.
Small Grain

Two acres of Shallu (Egyptian Wheat) were planted in "Plot 2, South of Road." When in the dough stage, a severe wind storm, August 23rd., blew most of it down, ruining it, even for grazing, as it molded from being rain-ed on. Enough was left standing to make an estimate of the probable yield, which was about 50 bushels of grain per acre.

The Delta Experiment Station, Stoneville, Miss., furnished us with enough Sagrain seed to use in our work this season, some of which was planted with the corn varieties, producing at the rate of 52.43 bushels per acre. Only the heads were harvested, which threshed out about 90% grain. The grain shatters very little; in fact, is very hard to thresh out clean, the opposite of which is Shallu's worst feature. We found Shallu very hard to harvest without losing a quantity of grain, from shattering.

Cattle

On account of the good rainfall during the summer months, the pastures have been good and the cattle are in fairly good order. A young Shorthorn bull was secured from the State University herd. Practically the entire herd is bred to him, several cows will calve within the next few weeks. No feeding has been necessary yet, as the fields have furnished good grazing for some time.

Farm Implements

Some additions have been made to the farming machinery the past year. Two Avery "Southern Queen" cultivators were bought and have been labor-saving implements. A majority of the cotton acreage was planted with a "Covington Cotton Dropper," which drops the seed in clusters of any desired amount of seed, spaced the desired distance apart. With the young cotton in this condition, chopping is reduced some. The operator
should be very careful to see that the planter is adjusted properly at all times, as a stand can be ruined with an indifferent man handling the planter.

**Boll Weevils and other Cotton Insects**

No poisoning for weevils was necessary, as the infestation was never heavy enough, until after the crop was mature. Late blooms and forms in the top of the plants were full of grown weevils at the end of the season. The cotton in the "South Lee Field" and "Plot 3, North of Barn" was injured some by the Flea-Hopper. No especial injury was noticeable in the remainder of the cotton. Lice injured some sections and the cotton worm would have ruined the crop, if it had not been given heavy poisoning. Rains from August 13th, to 17th, every day, made it necessary to repeat, daily, poisoning of most of the cotton.

**Pecans**

Several pecan trees were broken badly by a wind storm, August 23rd., being heavily loaded at that time. The Success, Nelson and Senator varieties being most damaged. Caterpillars stripped two varieties before we noticed them, these trees being on the back side of the orchard. The nuts from these trees were immature and only partly filled out. Other varieties made a good yield, Money maker and Stuart doing best.

**Buildings—Repairs**

A new metal roof was put on the pavilion during the summer, being finished off with a combination cap and ventilator, which should add to the comfort of the building during hot weather.

The dwelling now occupied by Mr. Baker, is in bad condition, needing a new roof and some work inside. We hope to be able to get to it sometime this year, as the building is being injured from lack of attention. Several of the
small buildings and sheds need new roofs and other re-
pairing.

Agricultural Meetings

The regular monthly Field Day meets were held each month, from March to October. These meetings were, as a rule, well attended and were instructive and beneficial. Some phase of the work on the Station was shown at each meeting and the experiments explained and inspected.

A four days Fair was held during October, a week in advance of the State Fair at Shreveport. The exhibits in the Agricultural Building were the best shown here in years; the farm displays and canned goods department showing up best. The livestock exhibits were discouraging, very few really being worthy of a place at all.

Plans for 1927

The work for 1927 will continue the same lines of work as followed the past year. Some cotton breeding work will be done, in cooperation with Dr. H. B. Brown, cotton specialist of the Experiment Stations.

THREE YEAR COMPOST ROTATION EXPERIMENT,
PLOTS A, B & C, EXPERIMENT FIELD.

In this experiment, one-third of the area is planted to cotton, one-third corn and cowpeas and one-third to oats, followed by cowpeas.

During the period between 1889 and 1908 the east half of each plot received an application of compost at the rate of 30 bushels per acre. Since 1908 the compost has been applied to the south half of each plot, therefore one fourth of each plot has received compost annually since 1889, one fourth has received compost annually since 1908, one fourth received it annually until 1908, while one fourth remaining has never had compost at any time. The NE $\frac{1}{4}$ receives application of Acid Phos., at 200 lbs. per acre.
The compost is made up of green cotton seed, stable manure and acid phosphate.

Results for 1926 are as follows:

<table>
<thead>
<tr>
<th></th>
<th>SE 1/4</th>
<th>SW 1/4</th>
<th>NE 1/4</th>
<th>NW 1/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLOT A Corn</td>
<td>Fertilized annually with compost since 1889</td>
<td>Fertilized annually with compost since 1908</td>
<td>Fertilized annually with compost until 1908</td>
<td>Has received no fertilizer since beginning of experiment.</td>
</tr>
<tr>
<td></td>
<td>12.9 bu. per acre</td>
<td>10.4 bu. per acre</td>
<td>9.9 bu. per acre</td>
<td>6.4 bushels per acre</td>
</tr>
<tr>
<td>PLOT B Oats Cowpea hay</td>
<td>1.49 tons per A.</td>
<td>1.05 tons per A.</td>
<td>1.15 T per A.</td>
<td>1.64 tons per A.</td>
</tr>
<tr>
<td></td>
<td>.86 tons per acre</td>
<td>.94 tons per acre</td>
<td>.78 tons per acre</td>
<td>235 lbs. per acre</td>
</tr>
<tr>
<td>PLOT C Cotton</td>
<td>849 lbs. per acre</td>
<td>800 lbs. per acre</td>
<td>622 lbs. per acre</td>
<td></td>
</tr>
</tbody>
</table>

COTTON VARIETIES, SEASON 1926

Variety: Source of Seed:

2. D P L No. 4—Delta & Pine Land Co., Scott, Miss.
5. New Boykin—Ferguson Seed Farms, Sherman, Texas.
7. Coker Cleveland, Strain 5—Coker Pedigreed Seed Co., Hartsville, S. C.
8. Coker Cleveland, Strain 6A—Coker Pedigreed Seed Co., Hartsville, S. C.
9. Coker Cleveland, Strain 6B—Coker Pedigreed Seed Co., Hartsville, S. C.
10. Coker Foster Strain 2—Coker Pedigreed Seed Co., Hartsville, S. C.
11. Lightning Express 6—Coker Pedigreed Seed Co., Hartsville, S. C.
12. Delta Type Webber Str. 5—Coker Pedigreed Seed Co., Hartsville, S. C.
13. Coker “Super-Seven”—Coker Pedigreed Seed Co., Hartsville, S. C.
21

14 Piedmont Cleveland—Piedmont Pedigreed Seed Co., Commerce, Ga.
15 Cook 588—R. E. Hudson, Auburn, Ala.
16 Cluster Cov.-Toole—W. F. Covington, Headland, Ala.
17 Wannamaker Cleveland — Wannamaker - Cleveland Seed Farm, St. Matthews, S. C.
18 College No. 1—State College of Agriculture, Athens, Ga.
19 Mexican Big Boll—N. C. Expt. Station, Raleigh, N. C.
20 Delfos 1374—Delta Expt. Station, Stoneville, Miss.
21 Delfos 0556—Delta Expt. Station, Stoneville, Miss.
22 Half & Half—Dr. C. C. Craighead, Athens, La.
23 Lone Star 65 A2-A3—Stoneville Pedigreed Seed Co., Stoneville, Miss.
24 Delfos 631 B4—Stoneville Pedigreed Seed Co., Stoneville, Miss.
25 Delfos 6102 A2-C3—Stoneville Pedigreed Seed Co., Stoneville, Miss.
26 Louisiana No. 1, Str. 6—State Expt. Station, Baton Rouge, La.
27 Louisiana No. 1, Str. 18—State Expt. Station, Baton Rouge, La.
28 Louisiana No. 1, Str. 63—State Expt. Station, Baton Rouge, La.
29 Louisiana Hybrid 143—State Expt. Station, Baton Rouge, La.
30 Alexander Wilt Resistant—State Expt. Station, Baton Rouge, La.

All of the above varieties were planted April 29th., following an application of fertilizer, in drill, of Acid Phos. and Nitrate of Soda, three to one by weight, at rate of 400 lbs. per acre. Was chopped May 22nd., being bunched two to five stalks in hill, ten to twelve inches apart, following which an application of Nitrate of Soda given at rate of 75 pounds per acre, ahead of first sweeping.

It was cultivated about every ten days during the growing period, until the bolls were beginning to open.

Harvested Sept. 10th. and Nov. 18th.
### COTTON VARIETY TEST,
#### SEASON 1926

<table>
<thead>
<tr>
<th>Rank</th>
<th>Value</th>
<th>Variety</th>
<th>Yield per A.</th>
<th>Lint %</th>
<th>Length of Lint</th>
<th>Value of Lint per A.</th>
<th>Yield per A.</th>
<th>Lint Seed per A.</th>
<th>Character of Lint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salsbury</td>
<td>1928</td>
<td>2574</td>
<td>32.2:1-1/2</td>
<td>14.57</td>
<td>829</td>
<td>138.23</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Delfos 0556</td>
<td>1928</td>
<td>2061</td>
<td>32.5:1-3/16</td>
<td>18.32</td>
<td>653</td>
<td>126.60</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Coker Foster 2 Delfos</td>
<td>1928</td>
<td>1950</td>
<td>33.5:1-3/16</td>
<td>16.82</td>
<td>670</td>
<td>122.79</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Delfos 1374</td>
<td>1928</td>
<td>1918</td>
<td>30.6:1-3/16f</td>
<td>18.32</td>
<td>587</td>
<td>120.84</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Coker D. T. Webber 5</td>
<td>1927</td>
<td>1755</td>
<td>30.4:1-4/4</td>
<td>20.32</td>
<td>534</td>
<td>120.71</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Delfos 6102A-C3</td>
<td>1926</td>
<td>1924</td>
<td>32.1:1-3/16</td>
<td>16.82</td>
<td>600</td>
<td>114.16</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Coker Super-Seven</td>
<td>1925</td>
<td>1972</td>
<td>33.1:1-1/8</td>
<td>15.71</td>
<td>620</td>
<td>109.82</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Coker Cleveland 5</td>
<td>1925</td>
<td>1957</td>
<td>35.3:1-1/16f</td>
<td>14.07</td>
<td>600</td>
<td>109.75</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Delfos 651 B4</td>
<td>1925</td>
<td>1755</td>
<td>30.2:1-3/16f</td>
<td>18.32</td>
<td>530</td>
<td>109.34</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Lightning Express-6</td>
<td>1937</td>
<td>1937</td>
<td>39.9:1-1/6f</td>
<td>15.57</td>
<td>598</td>
<td>106.49</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Mexican Big Boll</td>
<td>1924</td>
<td>1924</td>
<td>33.2:1-1/8</td>
<td>14.57</td>
<td>639</td>
<td>105.95</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Coker Cleveland 6B</td>
<td>1925</td>
<td>1658</td>
<td>36.2:1-3/16f</td>
<td>15.57</td>
<td>600</td>
<td>100.21</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Louisiana No. 1-63</td>
<td>1925</td>
<td>1716</td>
<td>28.9:1-1/16f</td>
<td>18.32</td>
<td>496</td>
<td>103.06</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>D P L. No. 4</td>
<td>1914</td>
<td>1914</td>
<td>34.6:1-1/16f</td>
<td>14.07</td>
<td>628</td>
<td>100.21</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Lone Star 65 A2-A3</td>
<td>1927</td>
<td>1807</td>
<td>22.5:1-1/8</td>
<td>14.57</td>
<td>587</td>
<td>97.72</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Coker Cleveland 6A</td>
<td>1927</td>
<td>1967</td>
<td>37.4:1-1-16f</td>
<td>13.57</td>
<td>623</td>
<td>95.08</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Piedmont Cleveland</td>
<td>1944</td>
<td>1944</td>
<td>33.5:1-15/16</td>
<td>12.57</td>
<td>651</td>
<td>94.76</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Wannamaker Cleveland</td>
<td>1905</td>
<td>1905</td>
<td>35.8:13/16</td>
<td>12.07</td>
<td>682</td>
<td>94.44</td>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>D P L. No. 5</td>
<td>1912</td>
<td>1612</td>
<td>31.5:1-1/8f</td>
<td>15.57</td>
<td>508</td>
<td>90.14</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>College No. 1</td>
<td>1923</td>
<td>1723</td>
<td>33.4:1-8</td>
<td>13.32</td>
<td>575</td>
<td>88.07</td>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Louisiana No. 1-18</td>
<td>1923</td>
<td>1690</td>
<td>28.9:1-1/8f</td>
<td>15.57</td>
<td>488</td>
<td>88.00</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Cook 538</td>
<td>1910</td>
<td>1710</td>
<td>30.4:7/8</td>
<td>12.32</td>
<td>622</td>
<td>87.51</td>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>New Boykin</td>
<td>1925</td>
<td>1632</td>
<td>34.9:1</td>
<td>13.32</td>
<td>569</td>
<td>86.42</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Triumph 406</td>
<td>1925</td>
<td>1625</td>
<td>34.9:1</td>
<td>13.32</td>
<td>567</td>
<td>86.12</td>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Louisiana Hyb. 143</td>
<td>1926</td>
<td>1976</td>
<td>28.3:15/16f</td>
<td>12.57</td>
<td>539</td>
<td>84.43</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Cluster Cov.-Toole</td>
<td>1906</td>
<td>1906</td>
<td>33.5:7/8</td>
<td>12.32</td>
<td>538</td>
<td>76.96</td>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Louisiana No. 1-6</td>
<td>1903</td>
<td>1903</td>
<td>20.8:15/16</td>
<td>12.57</td>
<td>507</td>
<td>75.68</td>
<td>Good</td>
<td></td>
</tr>
</tbody>
</table>

"Salsbury" and "Alexander Wilt Res." were outside rows, having a decided advantage over the others.

The above prices were based on the New Orleans Market, for Nov. 8th, 1926, Middling Cotton.

### COTTON FERTILIZATION EXPERIMENT
#### WITH AND WITHOUT DUSTING
##### FOR WEEVIL CONTROL

**Plot 1, Experiment Field.**

**AREA 1.44 ACRES.**

Variety of Seed:—Wannamaker Cleveland Big Boll.

**Fertilization Scheme:**

Acid Phosphate and Nitrate of Soda, ratio 2 to 1, in amounts of 300, 600 and 900 pounds per acre, on plots as shown below, without Potash. Balance, repeated as above with addition of Muriate of Potash at rate of 25, 50 and 75 pounds per acre. Where amount of Nitrate of Soda is greater than 200 pounds per acre, one-half is applied in fur-
row, ahead of planting, balance applied ahead of first sweeping after chopping.

Weevil Control:

By regular dusting, after 10% infestation, applied to central portion of entire area, leaving end fourths as undusted checks.

Check on Fertilization:

Four outside rows on each side of plot, extending full length of field.

Plots consist of eight in number, of four rows each, thirty six inches apart.

<table>
<thead>
<tr>
<th></th>
<th>Per A.</th>
<th>Value per Increase Fertilizer</th>
<th>Profit per A.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yield</td>
<td>A lint seed over ck.</td>
<td>cost per A.</td>
</tr>
<tr>
<td>Plat 1. Unfertilized</td>
<td>1606</td>
<td>$79.71</td>
<td>2.49</td>
</tr>
<tr>
<td>Plat 2. A. P. 200 lb N S 100</td>
<td>1656</td>
<td>82.20</td>
<td>9.97</td>
</tr>
<tr>
<td>Plat 3. A P 400, N S 200</td>
<td>1806</td>
<td>89.68</td>
<td>26.06</td>
</tr>
<tr>
<td>Plat 4. A P 600, N S 300</td>
<td>2131</td>
<td>105.77</td>
<td>5.30</td>
</tr>
<tr>
<td>Plat 5. A P 200, N S 100, Mur. Potash 25 lb per A.</td>
<td>1700</td>
<td>84.41</td>
<td>4.70</td>
</tr>
<tr>
<td>Plat 7. A P 600, N S 300, Mur. Potash 75 lb Per A.</td>
<td>2263</td>
<td>112.29</td>
<td>32.58</td>
</tr>
<tr>
<td>Plat 8. Unfertilized; Ck.</td>
<td>1606</td>
<td>112.29</td>
<td>19.40</td>
</tr>
</tbody>
</table>

Owing to low percentage of infestation, no dusting for weevil was necessary.
Two dustings were given during August for leaf worms, over the entire plot.
Yield on whole plot, 2219.
Yield per acre, 1541 pounds.
(In cooperation with Dr. W. E. Hinds, State Entomologist.)

COTTON FERTILIZATION EXPERIMENT, WITH AND WITHOUT DUSTING, FOR WEEVIL CONTROL.

Plot 2, Experiment Field.
1.44 ACRES

Variety of Seed: Wannamaker Cleveland Big Boll.

Fertilization Scheme:—Comparison of Acid Phosphate alone, at the rate of 200 pounds per acre; Nitrate of Soda alone, at the rate of 200 pounds per acre, and a combination of each, equal parts, at the rate of 400 pounds and 800 pounds per acre; Acid phosphate and Calcium Cyanamid, two to one, at 600 pounds per acre and Armours 15-4.11-5 cotton fertilizer, at the rate of 400 pounds sources of ingredients per acre.
Weevil control:—Same as in Plot 1. The series at each end left undusted, as check; the remainder, or two central series, dusted by regular schedule, after 10% infestation.

Plats consist of six rows each, results being taken from four inside rows, the remaining rows serving as buffers.

<table>
<thead>
<tr>
<th>No.</th>
<th>Fertilizer</th>
<th>Rate per Acre</th>
<th>Av. Wt.</th>
<th>Yield Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check, Unfertilized</td>
<td></td>
<td>51.06</td>
<td>1532 lbs.</td>
</tr>
<tr>
<td>2</td>
<td>Acid Phos. 200 lbs. per acre</td>
<td></td>
<td>54.19</td>
<td>1626 lbs.</td>
</tr>
<tr>
<td>3</td>
<td>Nitrate of Soda, 200 lbs. per acre</td>
<td></td>
<td>64.50</td>
<td>1935 lbs.</td>
</tr>
<tr>
<td>4</td>
<td>A. P. &amp; N. S., equal pts. 400 lbs. per A.</td>
<td></td>
<td>65.00</td>
<td>1950 lbs.</td>
</tr>
<tr>
<td>5</td>
<td>A. P. &amp; N. S., equal pts. 800 lbs. per A.</td>
<td></td>
<td>66.50</td>
<td>1995 lbs.</td>
</tr>
<tr>
<td>6</td>
<td>A. P. 400; Cyanamid 200 lbs. per acre</td>
<td></td>
<td>60.44</td>
<td>1813 lbs.</td>
</tr>
<tr>
<td>7</td>
<td>Armour’s ‘15-4.11-5,’ 400 lbs. per acre</td>
<td></td>
<td>61.94</td>
<td>1858 lbs.</td>
</tr>
</tbody>
</table>

Owing to low percentage of infestation, no dusting for weevils was necessary. Two dustings for leaf worms were given, over the entire plot, during August.

KUDZU PLOT, CORN AND COTTON TEST.

AREA .46 ACRE EACH

This area is very sandy, poor, unprofitable to cultivate, planted in Kudzu and allowed to go without cultivation until Kudzu thoroughly covered the surface, or about three years growth.

These plots were flat broken with tractor and disc break plow during February 1926, turning under heavy growth of dead Kudzu vines, stems and leaves.

CORN

Planted in water furrow, following application of Acid Phosphate, at rate of 250 pounds per acre, in drill. No other fertilizing material was used. Immediately after last cultivation, Kudzu and grass covered the entire plot, reducing the yield considerably.

Harvested Nov. 11., 13.64 bushels per acre.
COTTON

Planted on 3½ ft. rows, April 27th., following an application of Acid Phosphate in drill, at rate of 400 pounds per acre.

Barred off and chopped, May 19th., leaving 2 to 5 plants per hill, 10 to 12 inches apart. Given usual cultivation during growing season. Picked Sept. 30th. & Nov. 15th., yielding at rate of 2045 pounds per acre.

CORN VARIETY TEST RESULTS,

EXPERIMENT FIELD

<table>
<thead>
<tr>
<th>NAME</th>
<th>SOURCE OF SEED</th>
<th>Yield Bu. Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1 SURCROPPER— Ferguson Seed Farm, Sherman, Texas</td>
<td>31.74</td>
<td></td>
</tr>
<tr>
<td>No. 2 Yellow Dent— Ferguson Seed Farm, Sherman, Texas</td>
<td>30.00</td>
<td></td>
</tr>
<tr>
<td>No. 3 Chisholm— Ferguson Seed Farm, Sherman, Texas</td>
<td>34.74</td>
<td></td>
</tr>
<tr>
<td>No. 4 Calhoun Red Cob—I. L. Halle, Linville, La.</td>
<td>32.25</td>
<td></td>
</tr>
<tr>
<td>No. 5 Big Ear Prolific— Dr. L. C. Allen, Hoschton, Ga.</td>
<td>37.24</td>
<td></td>
</tr>
<tr>
<td>No. 6 Paymaster— W. H. Neal, Lebanon, Tenn.</td>
<td>34.00</td>
<td></td>
</tr>
<tr>
<td>No. 7 Rogers— D. H. Wallace, Verda, La.</td>
<td>32.00</td>
<td></td>
</tr>
<tr>
<td>No. 8 Whatley Prolific— Whatley Bros., Helena, Ga.</td>
<td>40.25</td>
<td></td>
</tr>
<tr>
<td>No. 9 Sentell White Dent— J. M. Sentell, Dixie, La.</td>
<td>38.00</td>
<td></td>
</tr>
<tr>
<td>No. 10 White Calhoun— State Expt. Station, Baton Rouge, La.</td>
<td>34.00</td>
<td></td>
</tr>
<tr>
<td>No. 11 Yellow Calhoun, State Expt. Station, Baton Rouge, La., Failed to germinate</td>
<td>31.24</td>
<td></td>
</tr>
<tr>
<td>No. 12 Calhoun Red Cob— State Expt. Station, Baton Rouge, La.</td>
<td>31.24</td>
<td></td>
</tr>
<tr>
<td>No. 13 Yellow Creole— State Expt. Station, Baton Rouge, La.</td>
<td>37.03</td>
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<tr>
<td>No. 14 White Creole— State Expt. Station, Baton Rouge, La.</td>
<td>44.6</td>
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<tr>
<td>No. 15 Calhoun Red Cob— N. La. Expt. Station, Calhoun, La.</td>
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<tr>
<td>No. 16 Calhoun Red Cob— W. S. Powell, Stonewall, La.</td>
<td>31.24</td>
<td></td>
</tr>
<tr>
<td>No. 17 Hastings Prolific— H. G. Hastings, Co., Atlanta, Ga.</td>
<td>44.25</td>
<td></td>
</tr>
<tr>
<td>No. 18 Sargrain (Sorgum)— Delta Expt. Station, Stoneville, Miss.</td>
<td>52.43</td>
<td></td>
</tr>
</tbody>
</table>

All of the above varieties were planted April 15th, in four foot rows, following an application of Acid phosphate and Nitrate of Soda in drill, 4 to 1 by weight, at rate of 300 pounds per acre.


May 17th. Dirted up with two 3 inch scooters and two 6 inch shovels on Cultivator.

June 3rd. Applied Nitrate of Soda, by hand, at rate of 75 lbs. per acre, followed by cultivator with four sweeps.

June 25th. Ran "Fowler" cultivator in middles, followed by pea planter.
DEMONSTRATION 3 YEAR ROTATION,

AREA NO. 1

OBJECT:—Comparison of yield, per acre, following three year rotation of corn and velvet beans, corn and cow-peas or soy beans, and cotton the third year, and an actual record of cost per acre of producing the crop.

COST:—Here means expenditures on labor, seed, fertilizer, etc., and does not consider interest on investment, depreciation of implements, etc.

Previous Crop:—Corn and Velvet Beans.
Present Crop:—Corn and Soy Beans.
(Acreage, 17 acres.)

Cost of Producing Crop:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of soil and planting</td>
<td>$87.33</td>
</tr>
<tr>
<td>Cultivation</td>
<td>91.50</td>
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<tr>
<td>Fertilizer, 3500 lbs. A. P.; 850 lb Nitrate of Soda</td>
<td>54.29</td>
</tr>
<tr>
<td>Seed, corn and beans</td>
<td>31.00</td>
</tr>
<tr>
<td>Harvesting</td>
<td>25.39</td>
</tr>
</tbody>
</table>

Total Cost, ...........................................$289.51
Total Cost per acre ......................$ 17.03

Total yield, 20912 lbs. corn;
Yield, per acre, 17.57 Bu.
Estimated yield beans, 11.00 Bu. per acre
Total yield, corn and beans, per acre, ..........$50.57
Cost of production, per acre, .....................17.03

Excess receipts per acre ......................$33.54

Beans estimated at $3.00 per bushel. Lower estimate will be necessary when there is no sale for seed purposes.

AREA NO. 2
(Acreage 13 Acres.)

Previous Crop:—Cotton.
Present Crop:—Corn and Velvet Beans.
Cost of producing crop:

Preparation of soil and Planting, ........................................... $64.89
Cultivation, ............................................................................... 59.63
Fertilizer, 2800 lbs. A. P., 700 lbs. Nitrate of Soda, .......... 44.10
Seed, Corn and Beans, ............................................................. 19.50
Harvesting, .............................................................................. 21.75

Total cost, .................................................................................. $209.87

Harvested 19790 lbs. corn; yield 21.7 bu. per A.
Estimated yield beans, 6.00 bu. per A.

Value 21.7 bu. corn, 6.00 bu. beans, ............. 33.70
Cost of production, ................................................................. 16.14

Excess of receipts per acre, ....................................................... $17.56
Beans estimated at $2.00 per bushel.

DEMONSTRATION 3 YEAR ROTATION
(Continued)

AREA NO. 3 (11 ACRES) "OLD PEACH ORCHARD"

Previous Crop: Corn & Peas.
Present Crop: Cotton.

Preparation of soil and planting ........................................... $ 76.48
Cultivation, chopping and hoeing, ....................................... 108.89
Fertilizer, ................................................................................ 88.15
Seed, ....................................................................................... 5.50
Poison and labor for worms, ................................................. 23.00
Harvesting, 17735 lbs. @ $1.30 ........................................... 230.55
Ginning, bagging and ties, ..................................................... 84.74

Total cost of production ....................................................... $617.31
Total cost per acre ................................................................. 56.12

6030 lbs. lint (34% 17734 lbs.) @ .15c ................. $904.50
11705 lbs. seed, @ $20.00 per ton, ......................... 117.05

Total receipts, ................................................................. $1021.55
Less cost of production, ........................................ 617.31

Excess receipts per acre .......... 404.24
Excess receipts per acre, ........ 36.75

"SOUTH LEE FIELD"
(Area 3, Continued. 8 Acres)

Previous Crop:—Corn and soy beans.
Present Crop:—Cotton.

Preparation of soil and planting, ........................................ $49.95
Cultivation, .............................................................. 53.38
Fertilizer, .............................................................. 72.40
Seed, ................................................................. 4.00
Poison and labor, for worms, .................. 8.40
Harvesting 10760 lbs. @ $1.30, ....................... 139.88
Ginning, bagging and ties, .................. 51.44

Total cost of production, .................. 379.45
Total cost per acre, .................. 47.43

3165 pounds of lint, @ .15c, .................. $474.75
7595 pounds seed, @ $20.00, .................. 75.95

Total receipts, .................. $550.70
Less cost .................. 379.45

Excess receipts .................. 171.25
Excess receipts per acre ........ 21.41

SOY BEANS
SELECTIONS FROM
ORIGINAL BILoxI

Planted June 26th., following oats.

Fertilizer, one application of Acid Phosphate, at rate of 200 lbs. per acre, in drill immediately ahead of planting. Harvested Nov. 4th.
YIELD PER ACRE

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
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<td>61</td>
<td>54 inches</td>
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<tr>
<td>64</td>
<td>36 inches</td>
<td>1872</td>
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<tr>
<td>86</td>
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<td>108</td>
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FORAGE CROPS

<table>
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<tr>
<th>Variety</th>
<th>Yield per acre</th>
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<tbody>
<tr>
<td></td>
<td>Hay, lbs.</td>
</tr>
<tr>
<td>Shallu (Egyptian Wheat)</td>
<td>3820</td>
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<tr>
<td>Sagrain</td>
<td>3245</td>
</tr>
<tr>
<td>Feterita</td>
<td>3565</td>
</tr>
<tr>
<td>Kaffir Corn</td>
<td>4320</td>
</tr>
<tr>
<td>Sudan Grass (2 cuttings)</td>
<td>4460</td>
</tr>
<tr>
<td>Mung bean</td>
<td>1880</td>
</tr>
<tr>
<td>Clay Cowpea</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td></td>
</tr>
<tr>
<td>Whippoorwill</td>
<td></td>
</tr>
<tr>
<td>Brabham</td>
<td></td>
</tr>
</tbody>
</table>

All of the above varieties were planted in field opposite Agricultural Building, June 28th., and given clean cultivation until mature.
WEATHER REPORT
NORTH LA. EXPERIMENT STATION,
IN COOPERATION WITH
U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU

<table>
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<tr>
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<td>17</td>
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<td>4</td>
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<td>13</td>
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<td>13</td>
<td>12</td>
<td>6.43</td>
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<tr>
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<td>9</td>
<td>10</td>
<td>12</td>
<td>10</td>
<td>6.44</td>
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<tr>
<td>September</td>
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<td>4</td>
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<td>1.00</td>
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<tr>
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<td>13</td>
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<td>10</td>
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<tr>
<td>November</td>
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<td>11</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>3.06</td>
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<tr>
<td>December</td>
<td>74</td>
<td>17</td>
<td>8</td>
<td>16</td>
<td>7</td>
<td>13</td>
<td>11.41</td>
</tr>
</tbody>
</table>

MEAN 86.75 33.83

STATE FUND
RICE EXPERIMENT STATION.
Crowley, Louisiana.

J. MITCHELL JENKINS, Superintendent of the Station and Associate Agronomist, Office of Cereal Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

Meteorological Observations.

Weather conditions were nearer normal in 1926 than during the years 1924 and 1925. The precipitation for January and March was the heaviest ever recorded at this station for these months. During June, July, August,
and September, the precipitation was much below the average for the same period during the past 16 years.

The total precipitation for the year was 63.68 inches, which is 8.40 inches greater than the average for the 16 years previous, and 13.71 inches more than that recorded for the year 1925. Only four times since 1910 has the annual precipitation been greater than it was this year.

The average mean temperature for the first five months was 61°F or 9°F less than for the same period last year; while the average mean temperature for the remaining months was practically the same for the two years. The monthly average mean temperature for the year was 4°F less than in 1925.

The lowest temperature during the year was 29°F, recorded January 13, and 14, and December 16. The temperature went to freezing or below eight times during January; once during February; once during November, and twice during December, making a total of 13 times for the year, against 12 times during the year 1925.

The highest temperature for the year was 99°F, recorded July 3.

THE EFFECT OF THE WEATHER ON THE RICE CROP OF SOUTHWESTERN LOUISIANA

Due to the extremely dry weather that obtained during the previous two years, and its effect upon the supply of irrigation water, most rice farmers did everything possible to seed their crop early thinking that the rains of early spring might not continue and would result in a shortage of water later; and that with early rice they would have a chance of making a crop with the water remaining in the streams and lakes. This desire to seed early led many to adopt the system of broadcasting upon a wet seedbed, and covering with a harrow. This system of “mudding-in” a crop is usually resorted to during seasons of frequent rains as a last means of seeding in late
spring. It sometimes proves satisfactory, but frequently results in a poor stand. Frequent rains during March and April did not allow the wet soil to bake over the seed and for this reason many of the fields that were "muddied-in", this year, had fair stands of rice, and at first the indications were that they would produce heavy yields. Towards maturity it was found that many fields were badly infested with weeds, and as a result the yield from early rice was in general disappointing. However, the acreage seeded to early maturing varieties was quite large. This placed on the early market too much of this type of rice, resulting in low prices from the very beginning of the harvest season.

In the end it was realized that all of the anxiety for fear there would be no water in the streams for irrigation purposes, was unnecessary. At no time during the season did the salt content of the water, of the streams and near-by lakes, go above about 19 grains of salt per gallon, and this was as late as August 19.

Excellent weather obtained during the harvest season, permitting cutting and threshing to continue with few interruptions until the entire crop was in the sack.

The Relation of the Consumption of Rice to Field Yields, and to Types or Varieties.

During the fall and winter there was much dissatisfaction and anxiety due to the price of rough rice. The farmer was not offered enough to pay for the expense of growing the crop. The demand for milled rice, of course, has much to do with the price offered for the rough; and on the other hand the price of the milled rice and the type of rice offered has much to do with the demand for the milled product. This is indicated by the fact that frequently certain types at a higher price are more readily taken by the consumer than other types at a much lower price.
This is not the first year that this condition relative to prices has occurred. It has been true frequently in the past, and has caused constant unrest throughout the industry on account of fear of over production, and low prices.

The situation could no doubt be greatly improved in future years by producing larger yields per acre, of types known to be preferred by the consumer. Frequently, the acre yields are so low as to necessitate a price out of all reason in order that the farmer realize a profit on his investment. When the yields are low and the type or variety of rice grown is not at all popular, both of which were true in many instances this year, disappointment, and dissatisfaction are bound to result.

If the average yield of rice in southwestern Louisiana were doubled, and this can be easily done by employing the most improved methods of culture, the farmer could sell at a reasonable price and at the same time realize a profit, thus aiding in one way towards increasing the demand for rice.

The failure of the consumption of rice to increase in the United States is due in large measure to the fact that the greater portion of the crop now grown consists of varieties of rice of a type not wanted by the consumer. Many of the old rice consumers are being gradually weaned from eating rice, and few new converts are made because of the unattractive culinary properties possessed by the bulk of our commercial rices.

To relieve the present situation the industry must realize that rice is not a very popular article of food in the United States, also that the life and growth of the industry depends on increased consumption. Therefore, every effort should be made by every one interested in rice culture in all its phases to ascertain just what the consumer wants, how he wants it, and why he wants it, and then use every effort possible to meet his requirements.

Much is being said at present about price fixing and
exporting. Price fixing does not seem to meet with the approval of those competent to judge as to its merits. From all indications, foreigners do not like certain types of rice we produce, nor the prices, any better than our own people. In fact, with few exceptions, the same general type of rice is preferred the world over; that is a type the grains of which when cooked, retain their general shape, stand apart, are not gluey, and are of tender texture. In addition to these qualities, the most popular rices possess distinct and palatable flavors. Therefore, that which is done to increase the consumption of rice at home, will at the same time increase the demand abroad.

**Sugar Cane Beetle Injurious to Rice**

During the fall many inquiries were received from farmers and canal owners in the Parish of Jefferson Davis, with reference to damage to rice caused by the sugar cane beetle. This insect was reported last fall in the northwestern portion of the parish. This fall it was reported in large numbers, from points as far east as, and farther south than, the town of Roanoke.

Very often this insect causes some damage to young rice in the spring, but is easily controlled by applying irrigation water. At this season its presence is noted generally throughout the rice growing region of the state. Last fall was the first time it was reported as attacking rice in the autumn. As soon as the fields were drained preparatory to harvest, the beetles appeared in large numbers, feeding on the rice culms at or just under the surface of the soil. It was estimated in some localities that 50 to 75% of the culms were chewed off. If the stems were cut off before the plants had matured the quality of grain was lowered. In the case of mature plants, loss was sustained due to lodging.

The only means of control found, so far, is to hold the irrigation water until the plants are mature, and begin harvest immediately after the water has been removed.
This makes harvesting very unsatisfactory, and is apt to result in loss due to the wet condition of the field.

The representative of the Bureau of Entomology, located at this station, devoting his time to Rice Insects, is doing all that he can do to determine some means of control.

**Station Results**

The same lines of investigation were pursued, as reported for the past years. A slight change was made in the rotation experiments, by extending them to include cotton. This addition was made for the purpose of determining the advisability of growing cotton in rotation with rice. This work will be conducted over a long period of years.

Artificial manure was added to the group of fertilizer experiments. This manure is made by composting rice straw, sulphate of ammonia and raw lime rock. If found satisfactory it will form a means of more profitably utilizing the large quantities of straw produced each year.

The yields on the entire station were less than of last year. This seemed true of commercial fields in this vicinity. There seems to be no special reason for this, unless the somewhat low mean temperature was in some way responsible.

Certain varieties of rice, in increase plats, which gave excellent yields last year, produced, under practically the same conditions this year, results that are very unsatisfactory. This was especially true of some early maturing varieties. This is discouraging because of the scarcity of strictly good early maturing rices.

In the date of seeding experiment, weather conditions prevented seeding as planned. In place of six seedings only four could be made. The highest yields were secured from seedings made May 18, 29 and June 15.

The results in the rate of seeding experiment indicate that little if any thing is to be gained by drilling more than
60 to 80 pounds of seed per acre; and that in broadcasting seed the highest yields may be expected from the heavier applications.

In the experiment in the manner of seeding, the yields from drilling were much heavier than where the seed was sown broadcast. An unusually wide range in results between the two methods was likely due largely to unfavorable conditions for germination.

Results in the rotation experiments show clearly the advantage of crop rotation over the continuous planting of one crop. The yields from plats that have been under rotation for several years are 5 to 7 times greater than from plats in which rice has been grown each year during the same period.

Results secured from commercial fertilizers agree rather closely with those secured in former years, and further prove the inadvisability of attempting to use such fertilizers to increase revenues in the growing of rice on Crowley Silt Loam.

**Extension of Station Results**

Information regarding results secured on the station is reaching a large number of people each year, as is indicated by the number and character of inquiries received. That this information is being used is indicated by the fact that many farmers are putting it to the test: by discontinuing the use of commercial fertilizers on rice; by the use of soybeans in rotation with rice; and by the purchasing of seed rice from the station. Much of the interest shown in the work of the station has been brought about by the Extension Division of the Louisiana State University. It is much regretted that it was found necessary to sever the direct contact between the station and the Extension Division of the University, by discontinuing, last fall, the position of rice specialist; and it is sincerely hoped that it will be found possible to re-establish this connection in the near future.
Entomological Work

The representative of the Bureau of Entomology of the United States Department of Agriculture, located at this station, continued his investigations, pertaining to rice, sugar cane, and soybean insects. He was able to confirm some control methods developed the year previous.

Equipment

The station equipment was strengthened during the year by the purchase by the State Experiment Station, of a mule to replace one that is unfit for work.

Living accommodations in the station residence were increased, by the remodeling of the second floor, to provide a hall, three bed-rooms, and a bath-room.

One of the outstanding improvements of the year was the graveling of the roadways on the station grounds. This was made possible by a donation of gravel from the Police Jury of Acadia Parish. This improvement adds greatly to the convenience of the employees, and to the attractiveness of the premises.

FRUIT AND TRUCK STATION,
Hammond, La.

B. Szymoniak, Horticulturist in Charge

Fertilizer Test for Strawberries

The plan of fertilizer applications previously reported, was interrupted by the use of commercial fertilizer of unknown sources of nitrogen, phosphorous and potash. The plan will be reinstated next year on the next plat to receive strawberries in the rotation.

Strawberry Variety Test

The ten varieties grown for the past three years have died out due to adverse seasonal conditions. The following
varieties were grown, Missionary, Gandy, Aroma, Lady Cornelia, Evening Star, Premier, Texas, Nick Ohmer, and Excelsior. These were compared with the Klondike. Five hundred plants of each variety were grown side by side on about the same type of soil with all conditions as culture and fertilizers the same. The Klondike plants grew through the hot dry summer and produced plants. The Missionary variety produced only a few plants. The other varieties with cultivation and mulching seemed to have dried up. We have therefore discontinued all these varieties; except the Klondike.

The following varieties were received for testing Nov. 10, 1926 from the Bureau of Plant Industry, Washington, D. C.


**Muscadine Grape Culture**

To determine the practicability of commercializing the growing of muscadine grapes.

This is the fourth season of growth. The Thomas variety interplanted with one male vine to ten producing vines is the one used for the grape juice production a wonderful crop set on the vines and the fruit began to ripen about the 15th of August. On the 25th of August we were
visited by a Tropical Storm which shook a great amount of the fruit off the vines.

The thousand vines produced 1540 pounds of grapes.

These were made into unfermented grape juice—amounting to 51 gallons.

The Thomas variety makes a straw colored grape juice of excellent quality.

The formula as developed by the U. S. Dept. of Agriculture was followed in the making of the juice. The vines are vigorous and healthy and the only attention given them was an application of 200 pounds of Nitrate of Soda and 400 pounds of Acid Phosphate per acre. The Kinffin system of pruning is practiced and cultivation in the form of plowing the vineyard is given in the Spring.

This project seems to point to a wonderful future for muscadines.

**Blackberry Culture**

Supplementary money crop to the strawberry crop.

The MacDonald Blackberry variety is interplanted with Lucretia Dewberry for pollination of the blackberry.

Twenty-eight Crates of 24 pints each were harvested. The fruit was of fine quality large size and the vines healthy and vigorous.

We had the same trouble experienced last season in gathering and marketing the crop.

Lack of labor is acute at the time of the ripening of the fruit which occurs at a time when the last crop of strawberries is being picked. There was no demand for the blackberries locally or for shipping. The variety has proven very satisfactory from the production and shipping quality standpoint. They ripen a month earlier than the wild blackberries and are better adapted to shipping. If grown as a community proposition when they could be shipped in carload lots they would prove no doubt a remunerative crop.
Rotations

This project has for its aim the development of the best system of rotations adapted to the strawberry section, with the idea of increasing humus and soil fertility in the most economical manner.

The following crop rotation was followed during the past season, Corn and soybeans, followed by Biloxi soybeans after which the strawberry crop is produced.

This rotation is proving very satisfactory from the standpoint of soil tilth condition. But now since a Skinner irrigation system was installed on the land where the strawberry crop is being produced it would seem that other more intensive crops should be grown. We have not yet determined which crops would suit the conditions best.

Satsuma Orange Culture

To grow satsuma oranges in order to determine the commercial possibilities in regard to time of bearing, yields, money return from each year's crop.

The dry season of 1925 was already reported on. During 1926 in February 100 more Satsuma were set out. These were fertilized with Barnyard manure in March and the land cultivated during the summer by discing and harrowing. The trees are looking fine and have made a satisfactory growth. No yield of fruit can be reported on.

Pecans, Pruned vs Unpruned Trees

To determine the relation of pruning to yield of pecans with special reference to increasing time at which the trees will come into bearing.

The trees have not made a sufficient growth during 1925 for pruning. One Schley tree set a light crop of pecans after four seasons of growth. The tropical storm of August 25, 1926 has blown all but one pecan which matured into a beautiful specimen.
The trees made a sufficient growth during the past season for pruning this winter.

**Stocks for Pecan Grafting**

To determine the best root system on which to graft pecan trees of named varieties.

This project is followed in cooperation with U. S. Dept. of Agr., The trees have not made sufficient growth for results. This observation may prove of value, that in grading the seed pecans into large, medium and small sizes the small though perfect seed produced trees just as large and just as vigorous as the finest large seed.

**HATCH FUND**

The Hatch fund of fifteen thousand dollars, is a Federal appropriation. The Hatch Act of 1887 was the Act that originally provided for the establishment of agricultural experiment Stations. A large part of this fund at this time is being spent on sugar cane, soy beans, and corn, in field experiments, and on a new project on farm mechanics.

This project is treated in a brief report to follow.

**Farm Mechanics Department**

C. L. Osterberger, Specialist

Last August we began experimental work in Farm Mechanics and undertook two major projects: (1) The Artificial Curing of Hay; and (2) A Study of the Deficiencies in Agricultural Implements Applied to Cane Culture.

In addition to these two projects we are charged with the proper care, repair, and operation of the Station's implements and Machinery, the making of such changes and adjustments as are necessary, together with all general farm mechanics problems that arise on the Station farms.

This being a new and broad field, considerable preliminary work necessarily had to be done and frequent and
varied demands have been made by several other departments for our time and assistance, which we have always tried to care for.

We have gathered a quantity of data on the artificial curing of hay and now have very definite ideas as what is desired and will have an experimental drying outfit in operation this season. Professor J. J. Munson, of the Sugar Engineering Department, is cooperating in this work, with the hope of finding a means of economically using the present sugar house facilities and equipment in curing hay artificially.

On our other project—A Study of the Deficiencies in Agricultural Implements Applied to Cane Culture—we have also gathered some data and have experimented with several types of tractor plows for fall breaking. We have at this time an experimental mold board plow for completely breaking a cane row in one operation, which, while not perfected, has possibilities.

This study will be continued throughout the cane-growing season, with the hope that we can find methods and implements which will help decrease the cost of cane production. Some attention has been given sugar beet culture. A roller has been designed and built for planting beets, and plans are being worked out for preparing, planting and cultivating two rows at a time, which will materially decrease labor costs. Further studies on both these projects are to be made.

Department of Agronomy

A. F. Kidder, Agronomist.


Professor Kidder resigned in June to accept a position in plant breeding work in Lima, Peru, S. A. The grains under his care have been preserved by the Department of
Agronomy of the University, for perpetuation. The cotton work has been assigned to Mr. H. B. Brown, and is reported under another heading in this publication.

Mr. Stoneberg's work in corn breeding goes on without interruption or modification.

The soy bean selections are cared for, temporarily, by a student assistant.

The beet sugar work has been enlarged and D. N. Barrow has been giving all of his time to this work since July 1, 1926; his report appears elsewhere.

**CORN INVESTIGATIONS**

Hugo Stoneberg, Assistant Agronomist,
Office of Cereal Crops and Diseases,
U. S. Department of Agriculture.

Investigations and experiments on the production and improvement of corn in cooperation with the Office of Cereal Crops and Diseases, United States Department of Agriculture, were continued along similar lines as in the preceding three years. About 4,000 self-pollinations and about 1500 cross-pollinations were made in connection with the breeding program.

Self and cross-pollinations were made in the seventh and eighth generations of selfed lines of several varieties to maintain the selfed lines and to determine the relative value of these lines in crosses. Some 116 crosses between selfed lines selected especially for husk protection against insect damage were grown in comparison with Yellow Creole, the most common variety in the sugar cane region. Some of the crosses yielded less, some more, and the majority yielded approximately the same as Yellow Creole. A few of the crosses, however, produced large yields of ears with husk which showed excellent resistance to ear-worm and weevil attack.
Self and cross-pollinations were made in the F2 of a cross between two previously selected selfed lines to determine whether better selfed lines and crosses can be obtained from the second cycle of selection than from the parent selfed lines.

Some 13 varieties were grown in comparison to determine their productivity. Cocke Prolific and Mosby Prolific were the higher yielders.

Data were obtained on the productiveness of several varieties influenced by the infection with the mosaic disease. The data for 1925 and 1926 have been submitted for publication as a Department Bulletin.

SUGAR EXPERIMENT STATION
W. G. Taggart, Assistant Director.
D. J. De Arensbourg, Field Overseer.

The field work of this station as organized, and reported on in the 1925 report, has been continued without change. More land has been opened up and made ready for experimental work, and still more land is being drained and put into a state of cultivation. The equipment for farm work was increased by the purchase of a tractor and three mules with necessary implements.

Rotation and Fertilizer Experiments

One hundred and fifty experiments embodied within a three-year rotation of two years of cane and one year of other crops were grown, harvested and the data therefrom placed on record. One hundred and twenty experiments embodied within a four-year rotation plan of two years of cane and two years of other crops, was likewise grown, harvested and the data recorded.

These experiments, while in progress only three years, have begun to attract a great deal of attention from the many planters who visit the fields of the Experiment Station, some of them making many visits to the station.
fields for the purpose of watching and discussing the progress of the crops as they grew. Data on hand already begins to show the value of wider rotation, the turning under of more legumes and good soil treatment.

In all of the general plantings of sugar cane in fertilizer tests and rotations, selected seed, secured in an inexpensive way such as could be used by all sugar planters of the state, was planted. The evenness of growth, uniformity of stand, and unusual good yields of the old varieties selected, point clearly to the wisdom of our practice and the advantages to be derived by those who choose to follow the example. In spite of the damage done by the tropical storm, D-74 gave as much as 22 tons from first year stubble, and 27 tons from plant. Louisiana Purple, from selected seed which was not broken by the storm, gave as high as 27 tons from stubble and over 30 tons from plant.

**Seedling Canes**

As in previous years we have cooperated with the Office of Sugar-Plant Investigations in securing and testing new varieties of sugar cane. Due to the freeze at Canal Point, Florida, in the winter of 1925-26, and the storm of 1926, we did not secure any new seedlings this year. Some new Canal Point seedling that had been started before the freeze, were brought forward and planted at the station. Two P. O. J. canes and one other variety, B. H. 10/12, were secured from Washington. B. H. 10/12 grew well in spite of a heavy infection of mosaic, contracted after germination here. It is worthy of note that some of the U. S. and Canal Point seedlings in addition to being immune or strongly tolerant to disease, show great resistance to cold weather. This year, with its early bud-killing frost, was not favorable to variety tests in that maturity was stopped at the time of the frost. We are strongly of the opinion that some of these vigorous canes that showed only a fair degree of maturity in comparison with the standard varieties, will
show ability of greater maturity when given a little longer growing period.

Very satisfactory tonnage was secured from some of the P. O. J. canes. P. O. J. 234 that produced only 16 tons as plant cane in 1925, produced 24 tons as stubble in 1926. P. O. J. 213, where there was a thin stand due to transplanting, gave 30 tons from first year stubble and 33 tons as plant cane. P. O. J. 36 gave 32.5 tons from plant. P. O. J. 228 gave over 35 tons from plant cane. In maturity P. O. J. 234 stands ahead, 213 is second, and 36 with 228 rank third. P. O. J. 826 made a very good growth and a yield of more than 30 tons from plant cane, but did not show up so well on stubble.

All of the P. O. J. cane grown from those varieties which have been released were used either for planting at the station or for planting out in the state. P. O. J. 234 was sold to planters at a nominal price, and 36 with 213 was put out under contract with planters who agree to sell eighty per cent of what they grow to planters in their community at not more than ten dollars per ton.

Some considerable seed of P. O. J. 228, 979, 2379, as well as selected seed of D-74 and Louisiana Purple, were furnished the U. S. station at Houma for experimental purposes, and this station received in return some P. O. J. 234, 36, 213 and 826 for planting in the western part of the state.

A bulletin is now in preparation on seedling canes.

Other Crops

Six and six-tenths acres of alfalfa produced enough hay to feed 16 head of livestock for the year.

A considerable acreage was devoted to testing varieties of soy beans which have been developed at the station. We now have a number of varieties with habits which make them more desirable than the old standard varieties.
ADAMS FUND

Fifteen thousand dollars is appropriated annually to each state by the Federal Government, under the Adams Act, for enlarging the work of the Experiment Stations. Under the provisions of this Act only work of a technical nature is permitted. The greater portion of the work is in the nature of laboratory research, looking to an enlargement of our knowledge of scientific facts and principles.

In Plant Pathology, the Purnell fund and Special Sugar Cane fund supplement the Adams fund.

Department of Bacteriology

W. L. Owen, Research Bacteriologist

The work of this department for the past year has been principally devoted to the two main projects which were begun about one year ago, and which were outlined in the report for 1925. These projects are (1) A study of the effect of buried cane trash upon soil nitrates, (2). The production of alcohol from bagasse.

The Effect of Buried Cane Trash Upon Soil Nitrate

The results of a large number of laboratory experiments on the effects of cane trash upon soil nitrates may be summarized as follows:

The addition of undecomposed trash to the soil results in a rapid loss of nitrates. This depressing action of the cane trash upon nitrate is quickly lost, however, after the trash has partly decomposed. This decreasing depressing effect of partially decomposed trash is very clearly reflected in the results of experiments where fresh trash is compared with trash that has been buried from one to six weeks. The results of these experiments show a gradual diminution of the loss of soil nitrate in direct ratio to the length of time that the trash has been allowed to decompose. The practical bearing of these experiments on cane culture is pre-
cisely this: that if the interval between the burial of the trash and the application of nitrate fertilizers be sufficient for decomposition, the incorporation of the trash will doubtless be beneficial to soil nitrates. Otherwise if it has not sufficiently decomposed, the depressing effect of the trash will no doubt be reflected in the transformation of the available nitrate into a less available form. In view of the fact that the trash from one ton of cane contains as much nitrogen as 27 pounds of cottonseed meal, the ability to add this much nitrogen to our soils without disturbing the equilibrium of our added nitrate nitrogen, becomes a matter of prime importance.

The addition of fresh trash to soil is also reflected in a change in the microflora. The most noted effect of the added trash being a marked increase in the number of soil fungi, and a higher ratio between their numbers and the total number of micro-organisms present. An effort to correlate this depressing effect of trash upon soil nitrates and the comparatively inert condition of partially decomposed trash with the starch and pentose content of the material, has given results which indicate that it is the elimination of these substances which removes the harmful effects of trash upon soil nitrates. It is quite likely that a determination of the starch and pentoses of trash may be used as a criterion of their effect upon soil nitrates, and hence its suitableness for incorporation in the soil simultaneously with nitrate of soda may be ascertained.

The data of laboratory experiments are to be applied in field experiments on the Experiment Station plats where cane trash is turned under, and the effect of adding this material to the soil will be studied in its relation to the nitrate content of the soil, as well as upon crop yield. Pot experiments are also contemplated, to further determine the effect of trash upon soil nitrates and plant growth.

ADCO EXPERIMENTS

The test of ADCO upon rice straw for the production of
artificial barnyard manure, which was begun in the fall of 1925, was completed in the early summer of the past year. The material decomposed satisfactorily and its physical condition, as well as its chemical composition, indicated a suitable substitute for barnyard manure. Field tests of this material are to be made to determine its manurial value for farm crops.

Investigation of the Possible Utilization of Bagasse for Power Alcohol

The status of bagasse in the sugar industry of this state has undergone a radical change within the past few years. Formerly regarded as a supplementary fuel for sugar factories, its utilization for fiber board has met with such conspicuous success that it seems not unlikely that this use for it may eventually consume the entire production from our cane crop. As a fuel the residual sugars of bagasse have a calorific value that contributes something to its use for that purpose; but these are detrimental to its keeping quality and have to be eliminated before the bagasse is used for fiber board. In view of the fact that these sugars give to bagasse a potential alcohol yield of from five to seven gallons of alcohol per ton, and their removal by fermentation, would tend to make the bagasse less susceptible to deterioration, it would seem very desirable to determine if the sugar content of bagasse can be efficiently converted into alcohol. This investigation was begun a year ago on baled bagasse from Glenwild factory, furnished us by the Celotex Company. The results of these experiments showed that the addition of unsterilized bagasse to fermenting molasses solutions tended to depress the yield of alcohol from the sugars present. Sterilized bagasse if used in proportions not in excess of 1 part by weight of bagasse to 1.5 of molasses, resulted in an overall or total efficiency of 90% of the theoretical. While it was found that the fermented bagasse was still susceptible to deterioration from mold fungi, when
in its moist condition, by treating it with suitable preservatives this could readily be prevented. The use of baled dry bagasse for alcohol manufacture was found to have several disadvantages; so during the grinding season the work was continued on fresh bagasse from the Station sugarhouse. The results on fresh bagasse have in almost every case given an increased yield of alcohol over the molasses solution containing no bagasse. In all cases this has indicated a satisfactory overall efficiency of fermentation. The ratio of bagasse to molasses, and the density of the molasses solution which is best adapted to the maximum utilization of the sugars in the bagasse, have received a great deal of attention in these studies. Special devices have been used for percolating the fermenting solution over the bagasse, and comparisons in efficiency between extraction with water and molasses water solutions have been noted. The results of the investigation of the fermentation of baled bagasse were published in the International Sugar Journal, 28. 463-70, 1926. This work will be continued until our present supply of fresh bagasse is exhausted.

Miscellaneous

In order to determine the distribution of micro-organisms in Cuban raw sugars from the crop of 1925, samples received through the courtesy of the American Sugar Refinery Company from their Chalmette plant at New Orleans, were tested. These 60 samples, representing approximately every cargo received at the Chalmette slips, were studied with the view of correlating the changes in composition of these samples in storage, with their respective microflora.

Calls Upon The Department for Consultation

Frequent litigation between buyers and sellers of sugars over deterioration of the product in storage, or in
transit, results in occasional requests to the Station to contribute the benefits of its experience in deciding these disputes. As a result of the fact that it was a pioneer in instituting these investigations, these calls may be considered a tribute to the farsighted policy which anticipated the scientific need of a better knowledge of the changes in sugars during storage. Two of these calls for consultation have come during the past year; one of them from the American Beet Sugar Company of Nebraska, and the other from New York City.

The Production of Industrial Alcohol from Sugar Cane

The large tonnages of cane which can be produced from some of the more densely growing varieties which are included in the variety tests of the Experiment Station, suggest the possibility of their utilization for power alcohol manufacture when the industrial alcohol market and blackstrap prices are more favorable thereto. With the view of determining the yields which might be expected from one of these canes experiments have been conducted during the past grinding season. These experiments have included the study of the optimum acidity to be maintained in the juice and the rate of seeding most conducive to the maximum fermentation efficiency.

Publications

The change in the research projects of this department one year ago, and the adjustments incidental to the new location and the prosecution of the new projects, are reflected in the small number of publications for the year. These are as follows:

(1) Fermentation of Bagasse in Relation to the yields of Industrial Alcohol. International Sugar Journal .28 463-70, 1926.

(2) Some Correlative Data on Cane Syrup Produc-


(5) The Fermentation of White Sugars. Submitted for publication, "Facts About Sugar" the latter part of 1925.

In view of the very adequate facilities which have been provided for this department, the prospects for its future are highly encouraging, and we may reasonably look forward to very satisfactory progress in all of our lines of research during the present year.

DEPARTMENT OF ANIMAL PATHOLOGY
Harry Morris, Veterinarian

The work in the department of animal pathology has been continued along the same lines of investigation as in previous years. The major portion of the time has been devoted to teaching and the minor part to experimental work:

Anthrax

The study of growing plants as possible carriers of anthrax spores was completed and published as Station Bulletin 196. The results indicate that anthrax spores were carried from inoculated soil by germinating and growing corn, oats, rice and bean plants. The anthrax spores were carried from the soil on the surface of the plant and not in the plant tissue.

The results obtained in this work should emphasize the great importance of sanitation in the control of anthrax and especially of the necessity for the enforcement of the law in regard to the complete destruction of all anthrax carcasses to prevent soil inoculation.
No general outbreak of anthrax occurred in the state during the past year. Several local outbreaks were reported from certain districts. St. Helena Parish reported the loss of quite a number of animals from this disease. This was rather peculiar because an outbreak of anthrax had not been reported from this Parish for at least forty years.

The University passed another year without the loss of an animal from anthrax. All the animals were immunized against anthrax during the spring months.

**Infectious Abortion.**

During the past year there was a slight increase in the number of cases of abortion in the dairy herd but the disease continues to be under control. Sanitary control measures have been practiced for many years with excellent results. The present crop of calves is sufficient proof for the above statement. The agglutination test is run at regular periods and all reactions are considered as carriers of the disease.

**Parasites.**

During the past year intestinal parasites in cattle have done very little harm. The stomach worms were almost eradicated by the dry seasons of 1924 and 1925 in which the rainfall was far below normal. During the past year the rainfall was above normal and this has given the worm proper surroundings for development. Pasture rotation and a clean supply of drinking water will assist in the control of this parasite.

During the past year the study of control measures for parasites in mules has been continuing with the mules on the Sugar Experiment Station. The mules were treated twice during the year. The mules were weighed every week and a complete record of the number of days that
each mule worked was kept. The results were excellent. The mules gained in weight while at hard work and colic was practically eliminated from the farm.

During the year all the mules and horses owned by the University have been placed under this system of parasite control. The animals are treated for worms at regular periods, and barnyard sanitation is put into operation. A certain number of animals on each farm are not treated and are used as controls.

Diseases of Poultry.

During the year a poultry department was established by the University. This affords an excellent field for the study of poultry diseases and parasites common to Louisiana. The various methods for disease prevention are being studied. Agglutination tests for white diarrhea in chickens are being made by the department, and this should be an assistance to the poultry raisers of the state.

The usual number of specimens have been received by the laboratory for examination and diagnosis. A large number of inquiries concerning the health of live stock has been answered and several articles have been written for the local press.

DEPARTMENT OF PLANT PATHOLOGY

C. W. Edgerton, Plant Pathologist, (Adams Fund.)
E. C. Tims, Assistant Plant Pathologist, (Adams Fund)
H. H. Flor, Assistant Plant Pathologist (Purnell Fund)
P. J. Mills, Assistant in Plant Pathology. (Special Sugar)

During the year 1926 the work in the Department of Plant Pathology was devoted mainly to a few projects. Additional work was started with funds from the special appropriation for the investigation of sugar cane problems.
Sugar cane diseases, tomato wilt, and Sclerotium wilt projects received most attention during the year. The seriousness of the Sclerotium rot of sugar beets caused the Sclerotium project to be revived.

Sugar Cane Diseases

The sugar cane disease situation was about as serious as it has ever been with the possible exception of 1924. The seed planted in 1925 was very poor, due to the borer damage and this was followed by the heaviest rainfall in the last 20 years. The cane came up to very poor stands, due to borer injury, red rot and excessive rains, and growth was very slow until the latter part of the summer. The members of the department spent most of their time during the summer and fall on cane disease problems. The work at the substations was curtailed and most of the time spent at the Baton Rouge station. The usual series of demonstrations were held, showing the value of seed selection.

Selecting strains tolerant to mosaic, was continued for the sixth year. The selected strains of D-74 and Louisiana Purple carried through the fifth year continued to show a high degree of tolerance to the disease. There was enough selected Louisiana Purple cane to plant several acres at Baton Rouge and to plant a number of small test plots in the various test fields over the state. There was not quite as much selected D-74 cane, but more than an acre was planted at Baton Rouge and some plots at the test fields. Selections were started in several other varieties this year.

The root rot complex (growth failure) was serious, especially, in the early part of the growing season. But after September 15, fields that had showed effects of severe root rot attack, recovered to a considerable extent. The work of culturing and examining cane roots from various parts of the state was continued. Experiments were con-
continued in the field and greenhouse, to determine the importance of the fungi, Rhizoctonia, Pythium and Marasmius in the root rot complex. The series of seed treatment tests with organic mercury compounds and other chemicals was continued. The seed treatment work was discontinued at the test fields over the state.

A survey of the sugar cane disease situation over the entire cane belt was made during August and September, supported by special funds from the state legislature. Much valuable information as to the distribution of the root rot organisms, prevalence of mosaic, and notes on growth of cane were obtained from this survey. Some of the data are to be published in a bulletin at an early date.

**Tomato Wilt**

The tomato wilt project was continued with special emphasis on the growing of stock seed of the wilt resistant strains. A new test plot was started and efforts are being made to get it thoroughly infested with the wilt organism in order that the selected strains may be thoroughly tested.

**Sclerotium Wilt**

In connection with the experiments with sugar beets, it was found that Sclerotium rolfsii and Rhizoctonia species were causing serious losses in the fields. It was estimated that 70% of the beets in some of the experimental plots were destroyed by these fungi. Examinations were made of a large number of beet plantings and data obtained that may be valuable in controlling these rot troubles. Preliminary experiments were started in the control of the rot diseases of sugar beets.

**Changes in the Staff**

Dr. E. V. Abbott resigned July 1, 1926 to accept appointment as assistant in Iowa State College of Agriculture.
Ames. Mrs. H. H. Flor was appointed Assistant Pathologist September 9, 1926. Mr. P. J. Mills was appointed Assistant in Plant Pathology August 1, 1926.

Publications During 1926


C. W. Edgerton, W. G. Taggart and E. C. Tims. The Selection of Seed Cane. Louisiana Agricultural Experiment Station Bulletin 195.


DEPARTMENT OF RESEARCH CHEMISTRY

J. F. Brewster, Research Chemist.

Cane Juice Clarification.

The report from this Department for 1925 dealt in part with the clarification and treatment of cane juice for the manufacture of table syrup by the use of some well known clarification agents and also by the employment of precipitated chalk with or without using phosphoric acid. Similar experiments have been continued with a view to finding cheaper forms of phosphoric acid or soluble phosphates such as the commercial triple phosphates of the fertilizer industry, some of which may be expected to serve the purpose of clarification.
Sugar Beets

This Department cooperated in the experimental manufacture of sugar from Louisiana sugar beets in the late spring of 1926 to the extent of operating the chemical control laboratory where all the analytical work of the beet campaign was done. The average sucrose content of all the beets sliced was 12.1 per cent. This is to be considered very good in view of the unfavorable weather occurring in the beet-growing season.

Analytical Methods.

Through the cooperation of the Audubon Sugar School several students were assigned to this Department in 1926 and the opportunity was thus afforded to review some of the more recent methods of analysis proposed for the Sugar Industry. The thanks and appreciation of the Department are due these students for their assistance and it is gratifying that the work accomplished by them was accepted by the Faculty of the University as a partial fulfillment of the requirements for advanced degrees.

The Clerget Method with Invertase.

The method of sucrose determination by inversion with the enzyme, invertase, was studied with the assistance of Mr. T. Y. Chou. In addition to checking the work already done upon this subject by others, a table of Clerget divisors was worked out for the method adapting it for use at different temperatures and at different sugar concentrations.

The Determination of Reducing Sugars.

With the assistance of Mr. R. G. Pradhan the volumetric method of Lane and Eynon for the determination of reducing sugars was compared with some of the official gravimetric methods and was found to be very satisfactory.
Raffinose in Louisiana Sugar Beets.

Sugar beets contain a small amount of the trisaccharide, raffinose which has an effect in the analysis of beets not usually taken into account in the routine laboratory methods. It may have a further effect in the recovery of sucrose from beet molasses. In order to determine the amount of raffinose in Louisiana sugar beets a number of samples of cossettes were analyzed using the enzyme method. The analytical work was performed by Mr. E. Infante. The amount of raffinose found varied from 0.0 to 1.4 per cent, the average for the samples analysed being 0.27 per cent. The sucrose equivalent of this quantity of raffinose is calculated to be 0.41 per cent or 8.2 pounds sucrose per ton of beets. This is a plus error in our ordinary methods of sucrose determination.

A Simple Ultrafilter

In connection with the purification of yeast enzymes used in some of the work described above, a simple colloidion ultrafilter was devised and has given satisfactory results. A description of it has been offered for publication.

Sugar Beet Tests

The sugar beet tests conducted in June, at the new sugar house of the University, were of value in showing that good white sugar may be made from Louisiana beets and that an experimental scale factory may be operated successfully from the technical if not from the financial standpoint.

New installations are expected to give trouble at the start and the sugar house was no exception. The beet slicer failed to work at first, due to woody beets. This difficulty was overcome by Mr. Munson and thereafter the slicer operated perfectly.
The beet scales got out of order three times and several tons of beets were sliced of which there is no record. It is therefore impossible to calculate accurately, the yield of sugar on the total amount of beets sliced during the short campaign. Furthermore, the house was operated intermittently instead of continuously; and the unaccountable losses from this cause were naturally high. During the time the slicer was giving trouble several tons of beets were lying on the unloading platform and a large percentage of them rotted. These were purposely sliced in order to learn what might be expected. The result was that no sugar was grained in the pan from these beets, although a small amount of grain was started. Due to poor circulation in the pan the grain could not be forced to grow and the mass had to be run to the crystallizer. The subject of spoiled beets will be considered separately.

The manufacture of sugar from beets is no longer a technical problem. The processes are thoroughly standardized so that, given sound beets, with reasonably high sucrose content, the successful operation of a factory will depend upon installing standard machinery and apparatus, and employing men from superintendent down, who understand the business.

Yields

It is well known that the past season in which the beet-growing experiments were conducted, was the worst that could be experienced. Due to excessive rainfall and cold weather a large percentage of the beets were spoiled. Nevertheless it was attempted to work spoiled beets along with sound ones, with the result that sugar yields were exceptionally low.

In a test run in which 64 tons of beets were sliced, 8,176.5 pounds of white sugar were recovered, or 127.6 lbs.
per ton of beets. The results of this test are shown in the following table:

Table I

Sugar Beet Test Run June 17-19, 1926

<table>
<thead>
<tr>
<th>Item</th>
<th>Lbs. Sucrose</th>
<th>Lbs. Sucrose lost</th>
<th>Per Cent on Beets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beets</td>
<td>128461</td>
<td>15555</td>
<td>12.109</td>
</tr>
<tr>
<td>Diffusion Juice</td>
<td>175805</td>
<td>14901</td>
<td></td>
</tr>
<tr>
<td>Loss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Pulp</td>
<td></td>
<td></td>
<td>294</td>
</tr>
<tr>
<td>In Waste Water</td>
<td></td>
<td></td>
<td>206</td>
</tr>
<tr>
<td>Undet. (in Fumes?)</td>
<td></td>
<td></td>
<td>.104</td>
</tr>
<tr>
<td>Press Cake</td>
<td>13230</td>
<td>437</td>
<td>0.34</td>
</tr>
<tr>
<td>Total losses above sources</td>
<td></td>
<td></td>
<td>1041</td>
</tr>
<tr>
<td>White Sugar—1st</td>
<td>4490</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Sugar from Raw</td>
<td>2356</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Sugar</td>
<td>1220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8066</td>
<td></td>
<td>6.28</td>
</tr>
<tr>
<td>In Crystallizer and String Mol. not Recovered</td>
<td>4858</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Losses</td>
<td>2631</td>
<td>2631</td>
<td>2.04</td>
</tr>
</tbody>
</table>

SPOILED BEETS

A very large proportion of the beets received at the sugar house in this campaign was spoiled. The cause of spoilage is a subject belonging in the province of the plant pathologist and only its effects upon sugar house operations need be discussed here. Two types of spoilage were noted in the beets and some analyses were made to determine their effects upon the plant tissue. One type, which for our purposes may be called black rot, was more or less superficial and had led to a darkening of the skin without
deep penetration into the beet. Analysis of whole beets so affected showed that no reducing sugars had been formed and practically no acidity. No sucrose was present in the darkened portions cut from beets and analyzed separately. Beets affected with the other type of rot were covered with a white mold growth, the tissue of the beet, in places sometimes of large area, was soft and watery and the rot had usually penetrated to a considerable depth. Analysis of beets affected with the latter form of rot yielded the following results:

<table>
<thead>
<tr>
<th>No.</th>
<th>%</th>
<th>Purity</th>
<th>Reducing Sugars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.59</td>
<td>37.1</td>
<td>12.5</td>
</tr>
<tr>
<td>2</td>
<td>5.30</td>
<td>47.8</td>
<td>6.96</td>
</tr>
<tr>
<td>3</td>
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</tbody>
</table>

It is a fact well known to sugar chemists that lime used in the clarification of beet juice reacts with reducing sugars, decomposing them and forming lime salts. It has been calculated that from 100 parts of reducing sugars there are formed 109 parts of lime salts, and that these lime salts are capable of preventing the crystallization of several times their own weight of sucrose. In other words the lime salts are melassegenic. Aside from this a part of the decomposition products of reducing sugars are of a gummy nature and are highly viscous. When sugar liquors containing these substances are concentrated in the vacuum pan circulation practically ceases and development of grain is out of the question. This occurred in the first run at the sugar house when a large quantity of spoiled beets was purposely sliced. A small amount of grain was “caught” but attempts to get it to grow were unsuccessful. The charge had to be run to the crystallizer and even then after graining the sugar was difficult to dry. Some spoiled beets entered nearly every run and the low sugar yield is traceable to this cause.

Beet spoilage is a cause of trouble in all beet sugar
producing countries but in Europe and the Northern United States it results from freezing after which rot producing organisms become active as happens with frozen sugar cane in Louisiana. In order for the crop to be successful here the harvest should be finished before hot weather begins. Beets injured by the black rot referred to above or in any other way will deteriorate more quickly in hot weather and they should enter the sugar house as soon as possible when harvested.

**PURNELL FUND**

The Purnell fund is a Federal fund, appropriated under the Purnell Act of 1925. The projects for investigation under this fund are approved by the United States Department of Agriculture, as are those of the Hatch and Adams funds. It is not required that the work should be of as high standard, in a technical way as for the Adams projects, but it is our desire to make the projects as practical as possible, in increasing our ability to deal effectively, in a fundamental way, with the farm problems to which they pertain.

There is some overlapping with other funds. H. J. Rodriguez, working under this fund, gives his entire time to the study of seedling canes. This overlaps on Hatch projects and on Special Sugar Cane fund projects.

Part of the administrative expense is paid from the Purnell fund.

**SUGAR BEET EXPERIMENTS FOR 1926.**

By D. N. Barrow.

In accordance with plans formulated by a committee of the American Sugar Cane League and the Experiment Station it was decided to have planted 100 acres of Sugar Beets for the purpose of testing the feasibility of growing this crop in the Sugar Section of the State. These beets were to be distributed in about five acre lots throughout
sugar producing parishes. It was agreed that the grower of the beets would stand all expense including purchase of seed, preparation of the land, cultivation, and harvesting, and delivery to the railroad. The Station on its behalf was to pay the freight and manufacture the beets into sugar. The only expense that the station undertook to defray in the growing of the beets was the superintendence and direction of the planting and cultivation which duty was delegated to the writer.

It was planned to commence planting in late October but was late when these plans were formed and it took some little time to arrange for acreage. After this was done, delay was experienced in getting the land prepared as the fall was unusually wet.

Owing to these unavoidable delays it was not until the 10th of November that the first field was planted. Rains continued all throughout planting season allowing planting not more than one or two days per week and consequently many fields were not planted until late in December. Not only were the rains unusually frequent but they were of exceptional severity, in many instances washing the freshly planted seed out of the ground and actually flooding the land for days at a time.

Only a few of the fall plantings were saved and none of these showed over seventy-five percent of a stand. The rains accompanied by unusual cold continued all during December, January and February and the replantings in February were made under the same adverse conditions and with not much better success.

**Method of Soil Preparation and Planting.**

As soon as the acreage was determined upon those agreeing to plant the beets were instructed to select well drained soil of medium to light texture that had had a good crop of cow peas or soy beans turned in. They were instructed to break this land as deeply as could be, harrow it thoroughly and then to lay it off in rows.
In order to determine the best distance of these rows and method of cultivation, three general methods were adopted in the laying off of the land.

Some of the rows were laid off thirty inches apart, others were made three feet while still others were made six feet wide, it being the plan on such to plant two rows of beets thirty inches apart on top of the 6 foot row. The incessant heavy rains of the fall soon demonstrated beyond question the error of this method. With such plantings two things immediately happened. When the flooding rains came upon the beds so planted they either washed the seed up or washed such a large amount of dirt from the middle of the row upon the plantings that the young plants were unable to push their way through and it was necessary the following February to replant all such fields.

Better success was secured with both the thirty inch and the three foot row plantings but owing to the difficulty of cultivation of the former and the poorer drainage following the use of the narrower row, the cultivation season soon demonstrated the superiority of the three foot row.

How the Planting Was Done

Few farmers were accustomed to handle such small seed and practically none were provided with suitable planters so it was decided to purchase one or two planters and to transfer these from field to field in so far as this was practicable. One single row hand Planet Jr., and one two row power planter of the same make was purchased.

The car in which the writer traveled was equipped with a half ton trailer and these planters were moved from one field to another therein thus planting about fifty acres. The other acreage was planted partly by hand and partly with corn planters specially adapted for the work.

While there was no lack of willingness and of intention on the part of the farmers to prepare the land correctly in few instances was this done owing to the total lack
of experience on their part in the planting of small seed; and almost invariably the land had to be reprepared after the writer arrived upon the ground. This not only delay-
ed the planting but is largely responsible for the difficulty of securing good stands. Though the land was rolled re-
peatedly after bedding, both before and after planting, the soil was nevertheless very loose and much more susceptible to washing by the torrential rains that almost invariably followed the putting of the seed into the ground.

The unfavorable weather that prevailed so constantly during the November planting continued without abate-
ment during the whole winter to the extent that it was possible to give the fields very little cultivation. Poor stands were obtained in most of the fields and when Feb-
ruary came it was decided that most of them should be replanted.

In a few instances where it was estimated that seventy-
five percent of the fall planting had lived through the win-
ter interplanting was practiced. This however, was soon found to be wasted labor. While none of the beets ever made the rapid growth that we expected yet the fall plants maintained such a superiority in size over the February seeding that the latter were never able to make much growth and added very little to the final tonnage but did prove a very great detriment to proper cultivation.

The weather during February and early March was almost a duplicate of the fall planting but a little greater warmth prevailed and so the average of stands on spring plantings was somewhat better than that of the fall.

Cultivation

The plants were blocked out to bunches every eight to ten inches as soon as the weather would permit after they had formed four to six leaves and the ground stirred shal-
low along the side of the drill. Blocking was followed in about ten days by thinning to one plant to the hill. With
the inexperienced labor available this proved a very difficult operation to have properly done and it was frequently necessary to go over the fields several times before the job was completed in even a very indifferent manner. Blocking and thinning after the planting are the most important operations in the growing of a beet crop. If the plants are not properly thinned there will not be sufficient room left for their best development. Again if not brought to a stand of one plant in a hill the same difficulty will be experienced as crowded beets cannot make the growth nor are they able to develop the sugar. On the other hand if not sufficient plants are left upon the ground it will be impossible to make the tonnage.

After thinning to single plants the after cultivation is simple and inexpensive, consisting chiefly in the maintenance of a shallow mulch for the conservation of moisture and the destruction of grass and weeds. With normal growing plants one hoeing after the final thinning should be sufficient. Care should be taken not to cultivate any deeper than is necessary to accomplish the above mentioned purposes.

Few planters were provided with suitable implements for cultivation of beets and as the acreage was small the purchase of such was not urged. Most of the available implements on a sugar plantation are large and heavy.

The beet is very susceptible to root injury by deep cultivation. Despite all warnings and efforts to the contrary much of the cultivation was entirely too deep and accompanied as the growing season was by excessive rain and abnormally low temperature, the beets never did make as rapid growth as in former years.

Diseases

During the first part of April the crop made fair progress and it began to look as though we could hope for the success that had so consistently followed the planting of
the sugar beet for the previous six years, but the excessive rains and errors of cultivation were bound to take their toll.

About the latter part of April a few plants began to die. The trouble was diagnosed by the Plant Pathologist as root rot and was attributed to the constant saturated condition of the soil accentuated by cool weather and errors in cultivation. The disease spread rapidly. There was no remedy except better drainage and aeration of the soil and this was rendered impossible by reason of the fact that rains continued until well into May. As the disease progressed there was ample proof that it was caused by lack of drainage. Low spots in fields were invariably the first to be affected and even at harvest time the rows near the ditch banks, those portions of the fields that were higher and even the ends of the rows along the quarter drains showed very much less disease.

The taking of samples for analysis began about the middle of April and was continued at intervals of about ten days until harvest began. Despite adverse conditions of growth the plants showed a rapid gain in sugar until by the middle of May there was sufficient sucrose and a sufficiently high purity to warrant their being worked. From causes that could not be controlled the factory was not ready until the first week in June. The beets continued to gain in sugar during this waiting period but unfortunately the spread of rot also continued and much tonnage was lost from this cause.

**Harvesting**

As soon as the factory was able to operate harvesting began. In an effort to assist in the enterprise, the John Deere Plow Company had equipped its agent for this territory with a regular beet lifter which Mr. J. M. Elliott, their agent, transferred from field to field in a Ford truck and with which most of the beets were dug. Where it was not
possible to dig with this machine, they were dug by plowing a furrow from both sides and then pulling by hand. While both operations were accomplished with little cost yet of course the harvester was far more efficient and economical.

Shipping the Beets to The Factory.

One very important part of the demonstration and one about which grave doubts had been advanced was how the beets would stand shipment in railroad cars during the hot weather that can always be expected at their time of maturity in this section.

In order to give them every chance possible either stock cars or ventilated cars were used. All uneasiness upon this point in the case of sound beets was soon dispelled as it was found that good sound beets kept with no appreciable deterioration either as to soundness or sucrose for a period of more than a week. In the case of beets affected with rot the case was different. With such fields it is impossible to discard all diseased beets. Many of the beets from such fields, though not showing any outward sign of the disease are really infected therewith; and when once placed in piles in a car even though protected from the sun and well ventilated the disease develops very rapidly and such beets drop rapidly in their sugar content and purity. Not only are such beets themselves rendered unfit for the manufacture of sugar but the disease rapidly spreads to otherwise healthy adjoining beets and in forty eight hours after loading such beets are unfit for the manufacture of sugar.

Much trouble was expected with the railroads in getting prompt delivery of the beets and as nearly all fields were more or less affected with rot, the quality of the beets received at the factory was much below what it should have been.
Acreage Yield and Cost of Production.

Following is a list of those participating in the work together with their acreage, the yield per acre and the cost per ton to deliver into cars in so far as it was possible to obtain this information.

In studying this report it must be remembered that the November plantings were, with few exceptions, a poor stand while the February planted beets never were able to make anything like normal growth. Again with few exceptions both plantings were severely affected by rot, the spring plantings particularly.

Glenwood Sugars, Napoleonville, 3.5 acres planted November. Plowed up and replanted in February, yield 1.38 tons per acre. Cost per ton $17.85, percent stand 90, percent rot 70, type of soil light sandy loam.

R. T. Gibbens, Minerva, La. Planted in November. Plowed up and replanted in February. Acreage 4.8 yield per acre 3.2; cost per ton $3.00, percent stand 70, percent rot 15. Type of soil light mixed loam.


S. J. Gianelloni, Burtville. Planted November, plowed up and replanted in February. Acreage 2, yield per acre 5 tons. Cost per ton 6.92, percent stand 70, percent rot 40, soil light, sandy loam.

A. Wilberts Sons, Plaquemine, planted in November, interplanted in February, acreage 1.5, yield per acre 6.89 tons, cost per ton 5.40, percent stand 60, percent rot 40. Type of soil, light sandy loam.

Louisiana State Penitentiary, St. Gabriel, planted in November. Interplanted in February, acreage 4.5, yield per acre 11.25 tons. Cost per ton 2.25, percent stand 80, percent rot 40, soil sandy loam.

Milliken and Farwell, Smithfield. Planted in November. Replanted twice in February, Acreage 3.63, yield per
acre 2.41, cost per ton 4.60, percent stand 50, percent rot 60, light sandy loam.

Standard Sugars, Thibodaux, La., Planted in November, interplanted in February, 6 acres yield per acre-cost per ton 10.55, percent stand 60, percent rot 70, soil mixed sandy loam.

Milliken and Farwell, Waterford, La., Planted November, interplanted in February, Acreage 4.65, yield per acre, 4.51 tons. Cost per ton, 3.98. percent stand 75, percent rot 30, soil mixed sandy loam.

Louisiana State Penitentiary, Angola, La., planted in January, Acreage 5, yield per acre 4.17, percent stand 75, percent rot 30, soil mixed sandy loam.

H. N. Sherburne, Sherburne, La., good stand, no rot, planted in November. Acreage 5, yield per acre 25 tons, percent stand 90, percent rot 10, soil light sandy loam.

E. J. Gay, St. Louis Plantation, La. Planted in November, replanted in February. Acreage 3, yield per acre 3.38 tons, percent of stand 60, percent of rot 60, soil sandy loam.


B. Thibaut, Napoleonville, La. Planted in February, acreage 1.5, yield per acre 1.5 tons. Good stand but heavily rotted. Soil sandy loam.

Godchaux Sugar, Reserve, La. Planted in February, Acreage 3.7, yield per acre 1.5 tons. Good stand and heavily rotted.

A. H. Gay, Plaquemine, La. Planted in November, replanted in February, acreage planted 1.5, beets planted the last of February and badly rotted. Soil, light sandy loam.

Poor stand and badly rotted. Yield per acre, not determined, but probably not over 3 tons.

Picard and Geismar, Dutchtown, La. Planted in November, replanted in February. Acreage 2.5, yield per acre 3 tons, soil, clay loam.

Willie Bergeron, Napoleonville, La. Planted November, replanted in February. Acreage 2. Beets rotted so badly that they were not harvested. Soil, sandy loam.

Dugas and LeBlance, Paintcourtville, La. Acreage 2.5, yield per acre 3 tons, soil, clay loam.


Dr. W. D. Haas, Bunkie, La. Planted March 2nd, good stand, little rot but owing to dry weather, beets grew very slowly and tonnage did not warrant digging as they matured after the factory had closed down. Percent stand 90, percent rot 0, soil sandy loam.

H. K. Bubenza, Bunkie, La., 1.25 acres beets planted March 2nd. Good stand but rotted badly and matured too late to work in factory. percent stand 60, percent rot 60, soil, sandy loam.

J. B. Levert, Shirley, La. Planted March 2nd, 3 acres, splendid stand and practically no rot, but grew very slowly owing to extreme dry weather and not harvested for factory. Soil, clay loam.

C. M. Roy, Opelousas, La. Planted in November, 2.5 acres. Poor stand and beets severely injured by hail. Little rot but beets not harvested. Percent stand 50, percent rot 20, clay loam.

Sterling Sugars, Franklin, La., 2 acres. Beets not planted until April 15th. Good stand.

Dr. R. O. Young, Youngsville, La. Beets not planted, owing to unfavorable weather.
Dr. J. W. Starring, Baton Rouge, La., 3 Acres. Planted in November and replanted in February. A very poor stand secured from either planting and in May transplanting was resorted to thereby reducing the acreage to less than two. The transplanted beets grew fairly well but never attained much size. They were so late in making growth that the factory had shut down before they were ready for harvest so no tonnage was secured. Stand (after transplanting) good. Disease 10%.

The variety used in all of the above plantings was Klein Wantzelegen, secured from the Great Western Sugar Co., of Denver Colorado.

Louisiana Experiment Station, acreage 5 yield per acre 7.36 tons. Planted in November, interplanted in February, percent of stand 90, percent rot 20, soil mixed sandy loam. These beets were badly flooded several times during their growth.

Louisiana Experiment Station, acreage 3, yield per acre 8 tons. Planted in November. Interplanted in February, percent of stand 80, percent of rot 15. Black Buckshot land.

The history of these beets is rather remarkable. The land upon which they were planted was the blackest and stiffest upon the place. It had been in cotton the year before and was prepared with difficulty for the fall planting. Heavy rains followed the planting and the land was covered with water for days several times during the winter. About fifty percent of a stand was obtained from the fall planting and interplanting was done in February without disturbing the fall plants. The rains continued with the floodings until well into April at which time the plants seemed very sick. They were cultivated and hoed out and took on new life and made a remarkable growth. Yield 14 tons per acre.

If the tonnage secured this year is to be taken as typical of what can be expected every year there would be no
further inducement to continue the work. Fortunately the cause of the low tonnage is very apparent when we compare these yields with those secured during the former years of experimentation and remember that the records show that the season just passed has not been duplicated in this state for eighty years. We have grown beets in the past with heavy rainfall at periods during their growth but such periods were not accompanied by such persistent low temperatures nor has the total rainfall ever equalled that of the past growing season. The plant Pathologist tells us that this heavy infestation of rot is directly attributable to cold water logged soil conditions. This statement is verified by field observations.

The best results in tonnage come from the field of H. N. Sherburne, at Sherburne, La., which produced twenty five tons per acre. These are new lands having only been in cultivation long enough to have eliminated the stumps. The field in which these beets were planted was particularly well drained by reason that it was located between two deep bayous not over four acres apart thus affording ample outlet for all surplus water.

In further testimony that the presence of rot is directly attributable to a season that is extremely rare we might cite the tonnage of former years.

The yield of beets planted upon alluvial soil in 1922 and harvested in 1923 was 19.9 tons per acre. The Fall plantings of 1923 gave 18.0 tons in 1924 and the plantings of 1924 gave 23 tons in 1925. It is worthy of note that the season of 1923 until well into the spring was unusually wet and that the one of 1924 was the driest year we have ever experienced. Yet the tonnage as well as the sucrose was entirely satisfactory.

Varieties.

In addition to the regular field crop eleven varieties of beets were planted in order to test their adaptability to
our conditions. These varieties were subject to the same unfavorable weather conditions as the field crop and are hardly comparable in so far as yield per acre is concerned. A better idea of their adaptability can be gained by a study of their sucrose, purity and the average size of the beets analyzed.

Analysis and Acre Yield of Sugar Beets
Varieties Grown on the Experiment Station 1925-1926

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<th>Variety</th>
<th>Analysis Brix</th>
<th>Sucrose</th>
<th>Purity</th>
<th>Beets used No.</th>
<th>Sugar in Weight Beets</th>
<th>Tons per acre</th>
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<td>82.77</td>
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ANALYSIS OF SUGAR BEETS

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<th>Sucrose</th>
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1926
In order to get the consensus of public opinion as to whether it was worth while to continue the beet experiments a convention of parties over the state who had shown an interest in beet growing was called to meet at the station in August, 1926.

At this meeting a preliminary report of the work and results for the 1925-6 crop was made and the subject thoroughly discussed. It was the unanimous opinion of those assembled that these results were far from discouraging and that the work should be followed up upon even a larger scale. After thorough discussion plans were made for the planting of two hundred and fifty acres of beets for the crop of 1926-7. Fifty acres of this was to be planted by the Experiment Station divided equally between the uplands and lowlands. A form of contract was drawn up for the growing of two hundred acres of beets by farmers distributed throughout the sugar section of the state. By the terms of this contract the station agrees to pay the value of one hundred pounds of raw sugar to the growers per ton of beets delivered on nearest railroad track with certain restrictions as to sugar content consisting of a premium for beets averaging over 13.5% sucrose and a deduction for less with the privilege of rejection after the content falls
below 12%. The idea of the contract is that the price paid will be sufficient to reimburse the grower for his trouble and at the same time leave sufficient margin for the expensive factory of the station to operate without using funds otherwise appropriated.

The writer whose time heretofore had been divided between the beet work and the direction of the Sugar Cane Test Fields was relieved of the latter work and put in complete charge of the beet work both in the field and upon the stations.

After studying the problem from all angles it was decided, with the advice of the Director, that the work for the coming year at the Station should consist of the testing of all varieties obtainable, about 26 fertilizer plats so as to make a study of the fertilizer requirements of our soils for beets, and the growing of the allotted acreages on the hills and lowlands.

The field plantings were divided between two varieties. "Klein Watzleben" had been the longest tested variety but a French Variety, "La Graine Selectionee" had made such a favorable showing in former tests that it was decided to make the field test with both varieties.

Early in August orders were placed for a ton of each variety of seed with the stipulation that these seed were to be delivered to us not later than October 1st.

In addition to the supply for regular field planting small lots of forty different varieties and strains were ordered from every available source for making the variety tests.

Despite the terms of the agreement for the purchase of the field supply and despite all efforts to expedite their delivery the main supply of seed was not delivered to us until the twentieth of October.

August and September and the first part of October gave favorable weather for the preparation of the ground for planting.
Unfortunately however few planters would begin this preparation before the arrival of the seed and under the circumstances it was not possible to deliver these seed to them before the last week in October.

By this time the cane harvesting season was upon them and in addition periodic rains set in which interfered very materially with the preparation and planting. Consequently only about one half of the two hundred acres to be grown outside of the Station was planted up to the 1st of January 1927.

Little difficulty was experienced in securing stands upon this area. Some few fields that were just coming out of the ground were killed by a temperature of 18 on the 12th of January but all beets that had attained a growth of four leaves came through this experience with slight injury and all fields where the plants were killed together with some addition have been replanted.

The same difficulties that delayed the plantings away from the station were experienced at the station. In the hills the land assigned for beets had grown a crop of soy beans many of which were variety tests and had to be saved. The periodic rains delayed their removal and consequently the preparation of the land and the planting of the beets.

Despite constant delays and disappointments from this cause we succeeded in getting about twenty of the assigned acres planted by the first of January. With the exception of two fields little difficulty was experienced in securing stands and though many of the plants were just coming up at the time of the freeze of January 12th none were injured thereby the temperature upon the hills not going as low as in the bottom lands—twenty degrees being the minimum.

With such fields as did come to a poor stand either interplanting or in extreme cases replanting has been resorted to and we now have our full complement of twenty five acres in the hills up to a good stand and growing nicely.
Among the first work done in the uplands was the planting of varieties and the putting out of the fertilizer tests. This was done on the 19th of October. Favorable weather brought the plants up promptly and to a perfect stand and in less than two weeks the effect of the various combinations of fertilizer began to be apparent. In fact this was apparent even in germination.

Never before in a life time's experience in fertilizer experimentation has the writer seen such marked results. Very much to our surprise a casual glance will convince even the most skeptical that the dominating factor in the stimulating of early growth in the hill lands is phosphoric acid. The phosphoric acid plats have not only outgrown all other combinations but actually germinated more promptly and came out of the ground with greater vigor. At the present time all phosphoric acid plats are twelve inches high and growing vigorously, while those plats containing only nitrogen or potash or both in combination are slightly better than the checks, about four inches high and are not growing nearly so vigorously. In the case of potash (kainit) there seems actually to be some inhibition as in a number of instances the potash plats are not so vigorous as the checks.

This series consists of 26 combinations including four checks and is repeated three times the plats being located in different sections of the field.

The beneficial effect of phosphoric acid was so pronounced that early in December it was decided to fertilize all the beets upon the hill with four hundred pounds of acid phosphate per acre. Where the plants were already up this was applied on the side of the drill. Where the plantings had been already made but the plants not up, the phosphate was applied right on top of the plantings and where seed had not been planted it was applied right ahead of the planting on top of the row and harrowed in.

The wisdom of this was not long in being demonstrated for in every such instance the plants germinated more promptly and vigorously and have maintained a vigorous
growth despite unfavorable weather conditions. At the
time of writing we have upon the hills twenty six acres of
beets ranging from twelve inches high to those just germin-
ating—all a good stand and growing vigorously. This
hill crop will practically be laid by the first to the
fifteenth of March.

With the alluvial lands of the station we have not been
so fortunate. The higher and better lands had already
been allotted to other work when the decision to plant the
beets was made so the land that was available for beets was
not so well prepared nor so well drained. While our rain-
fall was not near so abundant as the previous fall yet such
rains as we did have were so spaced that the beet land was
kept too wet for preparation and planting until about the
middle of December.

Ten acres were planted about this time in fair con-
dition and good stands secured but unfortunately the freeze
of January 12th killed all these plantings. The succeeding
days of January were excellent for soil preparation and
planting and all these fields together with five additional
acres were promptly replanted and are now up to a good
stand. Owing to seepage from the river the rest of the
land originally assigned to beets has been constantly too
wet for plowing and other land is now being prepared
therefor.

One field of black land that had been in beets last year
was in good condition on the twentieth of October and was
planted. Dry cool weather caused only an indifferent stand
and in the latter part of November interplanting was res-
orted to. The two plantings produced a splendid stand
but the younger plants were killed by the January freeze.
Since then this land has been too wet from river seepage to
be cultivated but interplanting has again been resorted to
and should the river recede in time hopes are entertained
that a crop of beets can yet be grown upon this land. The
older plants stood the low temperatures splendidly and
have all recovered from its effects but are not growing due
to saturated soil and inability to work them.
Duplication of the fertilizer and variety work referred to upon the hill lands has been followed in the alluvial lands.

The work at the station has required so much of the writer's time that he has not been able to give the field work the supervision wished and that it should have received. Had this been possible we would probably have a larger acreage planted and up in the field.

At present we have about one hundred and eighty acres of beets planted in the state all up to a stand and growing well. There are thirty or forty acres that will be planted by the first of March and with favorable growing season these late plantings should make fair growth so it looks as though we should go into the harvesting season with a two hundred to two twenty five acreage the majority of which is already safe barring unusual weather conditions.

With anything like our usual weather conditions from now on it looks as though we are going to be able to give the subject of sugar beet growing a very thorough and exhaustive test this year.

ENGINEERING DEPARTMENT
J. J. Munson, in charge.

Cane Table Syrup Making

In accordance with our outline of November 25, 1925, we have proceeded to carry out, as far as possible, the experiments on syrup making. It will be recalled that an open copper syrup pan was installed in our sugar house for the purpose of making syrup. This, together with other equipment that has been especially arranged, was used in carrying out this work.

Referring to the outline mentioned above, it may be seen that the first item was to determine the effect of the depth of boiling on color and flavor of syrup. An attempt to carry out the experiment relative to this, concentrating
finally in the open pan, resulted in a very dark syrup, even for the very lowest depth of boiling, which in this particular case was one inch. We attributed the dark color to the low purity of the cane, that was used. This purity was an average of 57. The low depth should have given the lightest color syrup. This being known without doubt, the experiment was discontinued for the reason that the purpose was to determine the difference in color of syrup for the different depths of boiling, knowing that the low boilings would give some better color. It is thought that with normal cane there will be considerable difference in color for these different depths of boiling. However, this is not known definitely.

In this experiment there was no clarification used. The raw juice was taken directly into the open pan and skimmed. Indications are that syrup made in an open pan by skimming for the clarification will be dark and strong in flavor, regardless of the depth of boiling, unless the purity is high.

The second and third items in the outline were to determine whether or not it is best to concentrate from juice to syrup in the open pan, or to boil to a light or semi-syrup in the open pan and do the final concentrating under vacuum. Two experiments were carried out, boiling and skimming raw juice in the open pan, carrying the concentration to an average of 21 brix and then boiling to final syrup in the vacuum pan under 26" of vacuum. In each case this resulted in a lighter color syrup with a milder flavor than boiling to final syrup in the open pan. During this experiment observations were made on the different depths of boiling to the semi-syrup from 1" to 10" and for this range there seems to have been no difference in the quality of the semi-syrup. The question of the depth of boiling was also closely observed on all of the experiments on making semi-syrup on the open pan with the same results. The purity of the juice used for these experiments was 61 and this high purity compared with the
first experiment would possibly have resulted in a somewhat lighter syrup in any event.

Two experiments were run on sulphur and lime clarification, about the same as is used for making sugar in some cases. That is to say, the juice was sulphured to an acidity of about 3-1/2 c.c. and limed back to an acidity of about 1/2 c.c. This juice was passed through the double effect evaporator and concentrated to an average of 12 Be, then passed through the open copper pan for heat treatment where it was skimmed. The concentration was only slightly increased in the open pan, about 1-1/2 Be. The semi-syrup was then taken into the vacuum pan and concentrated. The color was lighter than any of the previously made syrup, but the usual sulphur taste was present. The main purpose of running this experiment was to obtain a syrup for the low purity cane, with which to compare the syrup that was made by other methods, as there is no doubt about making a light syrup with Sulphur and Lime clarification when the cane is anything like normal.

One experiment was made on lime clarification alone, the juice being brought from its original acidity to juice about neutral. The method of boiling was the same as that on the two sulphur tests and resulted in a syrup darker in color than the sulphur and lime method produced, but somewhat milder in flavor.

The result of the first experiment on depth of boiling, concentrating to final syrup in the open pan, indicated that it would have been a waste of time to reverse the above method of boiling, that is to say, concentrate to a semi-syrup under vacuum and finish to final syrup in the open pan. Indications were that any attempt to boil heavy syrup in the open pan would result in a dark product for the low purities that prevailed. Therefore no experiments were made along this line.

Seeing that it was impossible to produce a syrup light in color without employing some form of bleaching ma-
tstial, arrangements were made with the Darco Corporation to carry out some tests using their Char. This company had previously indicated that they were anxious to carry on some work in table syrup making, using their product. This is the reason why Darco was selected.

In accordance with the above Messrs. B. T. Nace and E. W. Harris were sent to the University and remained over a period from November 29th, until December 23rd. During this time seven (7) runs or experiments were made using their Darco Char.

Test Number 1 was as follows:

Mill juice was clarified by filtration over super-cel and treated with Darco. The liquor was then taken into the vacuum pan and concentrated. The quantity of Darco used was 2% on the weight of solids in the juice. There resulted a rather mild flavor syrup, light in color. The purity of the juice used for this test was 61.

In Tests No. 2 and No. 4 mill juice was sulphured, limed, then concentrated to 12 degrees Be. in the evaporator and treated with Darco. The resulting semi-syrup was then taken into the vacuum pan and boiled to final concentration. The purity of the juice used for this test was 59. The sulphur used increased the acidity up to 3.6. It was limed back to about 1 c.c. acidity. The results showed that the sulphuring had practically no effect on the action of the Darco. It seemed that the Darco removed some of the undesirable sulphur taste. The cane flavor was not materially affected by the use of the Darco. The flavor of the syrup, however, did not compare with a high grade open kettle syrup as is often obtained in the small country open pans. This is thought to have been due principally to the low purity of the cane.

In Test Number 3, the mill juice was limed but no sulphur used. It was concentrated to 12 Be. and filtered over Darco. Two percent Darco was used in this filtration.
There resulted a syrup somewhat darker than that from test 2 and 4, but of a slightly better flavor due, possibly, to the absence of the sulphur. Purity of the juice used for this test was 60 and it was limed from its initial acidity back to approximately neutral.

In test 5 and 6 mill juice was clarified and filtered over super-cel. The filtrate was then evaporated to a semi-syrup 21 brix in the double effect, then passed through the brush pan, boiled and skimmed, after which it was filtered over Darco, and then concentrated finally in the vacuum pan. In test 5 the purity of the juice was 61 and in test 6 it was 64.

There did not seem to be any great difference in the syrup from each of the experiments except that from the high purity - 64, or test 6, it was a little lighter and possibly had a little better flavor. Approximately 2% Darco was used in each of the tests. There resulted a syrup in each case lighter than any of the previous tests and of a somewhat better flavor.

Test No. 7 was made with cane produced on the hill land. Its purity was considerably higher than the same kind of cane produced on the low river land. In this particular case the purity was 72. The test was carried out in exactly the same way as 5 and 6. The syrup was considerably lighter and had a better flavor than any of the tests that were made. In this connection it might be observed that while the purity of the cane used in the last test was higher than that of the previous runs, it was still below normal. Cane produced on the hill land should run at least 80 in purity in a normal year and this difference between 72 and 80 would possibly make a great deal of difference in the quality of the syrup made. There was not enough of the high land cane to make a check run, there being only about 12 tons available.

For the low purity cane the tests seem to show that there is a possibility of improving very much the color and flavor of syrup made by using Char. For these low grade
juices the results show that the flavor and viscosity of the syrup was not materially affected by the use of 2% Darco on the weight of solids in the juice or semi-syrup. There is no doubt that the use of carbon improved the taste of syrup made from these low grade juices.

It was found that even 2% carbon did not entirely give a color control, that is to say, there resulted a syrup in almost every instance that was a little too dark in color. However, it is thought that with normal cane there will be no trouble in obtaining color control.

It is not known to what extent the flavor and viscosity will be affected using chars in connection with high grade cane for the manufacture of syrup.

The process that gave the best results was as follows:

The mill juice was treated with super-cel and the filtrate concentrated to 12° Be. The semi-syrup was boiled in the brush pan where it was skimmed, then treated with Darco. The filtrate was concentrated in the vacuum pan.

The above results seem to point out that it is desirable to carry the syrup experiment through another year when we are able to obtain cane that is practically normal. There is no doubt that if table syrup is to be made from low purity cane, such as we have had in the past two years, not only more refinements will be necessary in the known processes, but it will possibly be necessary to depart very widely from the methods used in the past.

The last item on our outline of November 25, 1925, calls for the determination of the rates of evaporation in connection with open evaporators. Three tests were run and the results recorded. There seems to be a coefficient of heat transmission somewhat lower than for vertical tube apparatus boiling under atmospheric pressure. Also in the particular type of pan with the flat bottom, that we ran the tests on, the results of the rate of evaporation obtained, or the coefficient of heat transmission, seems to be somewhat lower than for coils. This is thought to be due
to the formation of vapor next to the bottom sheet in the pan which increases the resistance to the transmission of heat. The results show that the average coefficient of heat transmission is approximately 195.

The details from which the above general remarks are made are being withheld for the reason that it is expected that enough material will be gathered on this experiment to justify the publication of a bulletin, at which time all data will be given in more detail.

POULTRY DEPARTMENT

By F. C. Old, Poultry Husbandman.
G. W. Knox Jr., Assistant in Poultry.

The Projects in Poultry Husbandry are New

Two projects have been undertaken for a period of three years. The very nature of these experiments, and the lack of experimental data concerning them in the South make a great deal of preparatory work necessary.

The Substitution of Nicotine Sulphate (40% Nicotine) Solution for Tobacco Dust in the Treatment of Roundworms in Poultry.

In this project it was necessary to try different strengths of the solution in order to find the limits of accommodation of birds of different classes and ages. Chickens which showed by examination of feces that they were infested with roundworms were placed in batteries which had dropping pans. The batteries and dropping pans were disinfected carefully and the feces examined after different strengths were administered. The project has gone only far enough to find that there may be considerable danger in recommending this solution generally to the laymen. Unless the solution is mixed thoroughly before it
is drawn from the container, and unless the solution is approximately 40%, there is nearly always danger of prostrating the birds and often times there is danger of killing them. The highest limits of the solution which can be given without toxic effects in chickens in individual dose is 9 c.c. of 40% nicotine in a nicotine sulphate solution in 991 c.c. of water. In flock treatment where it is mixed with the mash, it is possible to increase the solution to 10 c. c. of nicotine sulphate solution, 40% nicotine in 990 c. c. of water. No data have been tabulated as to the results of nicotine sulphate.

Iodine suspensoid, after the formula of Chandler, is being used as a check on the nicotine-sulphate solution. It has not been carried on long enough to report data.

The Dressing Shrink of Milk Fatted Poultry With Particular Emphasis upon Classes, Breeds, and Grades of Poultry.

This project has been running actively only two months, and as is the case with the previous project, procedure has not been standardized. It was very necessary for us to devise a fattening ration which would give uniformly good results in the South, and at the same time keep the birds from going “off feed.” The ration has not been decided upon, although several thousand pounds of chickens have been fattened. It will possibly take three or four months more to find the desirable ration. It does not seem that there will be any trouble in finding enough chickens to use in connection with this experiment.

COTTON BREEDING DEPARTMENT
H. B. Brown, Cotton Breeder.

Work in the Cotton Breeding Department was started July 1, 1926. The work embraces certain cotton and soil fertility investigations formerly conducted by the Depart-
ment of Agronomy, and in addition, more extensive cotton breeding and soil fertility work at Baton Rouge and in other sections of the State. An effort will be made to develop or secure better cotton varieties for different sections of Louisiana and to determine the best and most economical fertilizers to use.

During July and August studies were made of the cotton varieties in the variety test at Baton Rouge and of the new strains planted there. Also trips were made through all of the leading cotton growing sections of the State to investigate cotton growing conditions and make arrangements with growers for carrying on certain cooperative experiments in the future. During September and October the cotton grown on the Experiment Station plats was harvested and a number of plant selections made at Baton Rouge and at other places in the State. These selections are to be used in breeding work in 1927.

Results from 1926 Experiments.

The variety tests conducted in 1926 were not very satisfactory, due to the fact that stands were not uniform and fungus diseases and insect pests injured the crop considerably. The leading varieties in respect to value of lint and seed were, given in order of rank:- Miss., Station Trice, Lightning Express, Coker's Cleveland No. 5, Delfos 6102-A2-C3, Klondike Delfos 6102, Deltatype Webber, Delfos 631-B4, Louisiana 63, D. & P. L. No. 4, and D. & P. L. No. 5.

None of the new strains of cotton produced by the Louisiana Experiment Station made a very good showing in the tests or increase fields. The strains were disease resistant and some of them had good staple length, but the lint percentage was low and the strains too late for growing satisfactorily under heavy boll weevil infestation. The fertilizer tests gave no conclusive results. It will be necessary to conduct these experiments for a series of years in order to secure reliable information.
Work For 1927

We have planned to continue, with some slight changes, the two-year rotation, the three year rotation, and the test of various carriers of nitrogen experiments, which were planned by Director Dodson and Professor Kidder. (For a more detailed outline, see the Annual Report of the Agronomy Department for 1925, in the Thirty-Seventh Annual Report of the Louisiana Experiment Stations.) Various fertilizers are used in the rotation experiments. In addition to the fertilizer work mentioned, rather extensive fertilizer tests will be conducted on the lowlands or alluvial soils at Baton Rouge; near Lafayette on prairie soil; near Monroe on the upper Ouachita valley soils; at Calhoun, on typical North Louisiana upland soils; and near Shreveport, on upper Red River Valley soils.

Rather extensive cotton variety tests will be conducted in each of the regions mentioned in the preceding paragraph, while additional breeding work will be carried on at Baton Rouge, Calhoun, and Shreveport.

The alluvial lands in the northeastern part of the State produce much cotton but since this region is comparatively near and has soils similar to the soils at Stoneville, Mississippi, where there is an Experiment Station that is doing much cotton work, it was thought best to work principally in other parts of the State. Results obtained at Stoneville will be of value to the region just mentioned.

Special Appropriation for Sugar Cane Investigations and Other State Funds.

As explained in the general preface, the Legislature made a special appropriation of $25,000 for 1926, and the same amount for 1927 for cane investigations. This was construed as meaning that the first appropriation should run from July 1, 1926 to June 30, 1927, and the second, from July 1, 1927 to June 30, 1928.

The Advisory Committee approved a budget providing $14,000 for cane borer investigations, $6,000 for cane dis-
eases, and $5,000 for supervision of variety tests at the test fields, and for extension work. The work on plant diseases is covered in the report of the Department of Plant Pathology, given under the Adams fund. The reports on the other two projects follow. Since the work on boll weevils and internal parasites of livestock is under the Entomological Department, the full report of that Department is included here.

DEPARTMENT OF ENTOMOLOGY
W. E. Hinds, Entomologist
Herbert Spencer, Assistant Entomologist

STAFF

During the year 1926, five-ninths (5/9) of the time of the Entomologist has been devoted to the Experiment Station work. Assistant Entomologist, Dr. Herbert Spencer, has given full time to the work. Beginning June 1, 1926, Miss Nathalie Poirrier became Secretary to the Entomologist, devoting one-half of her time to Experiment Station work and the balance to Extension work. On July 15, 1926, Mr. B. A. Osterberger was appointed Assistant Entomologist with full time on sugar cane pest work. On November 15, 1926, Mr. Chas. L. Stracener was added to the Staff as Assistant Entomologist with full time on sugar cane work.

In addition to the foregoing, the Department has utilized the part-time service of a considerable number of students during the rush of the sugar cane borer season. The service of these men has been invaluable in the prosecution of our investigations.

PROJECTS

Three major projects have been under way during this season:
1. Sugar cane borer control, and a study of the soil-inhabiting animals attacking the roots of sugar cane.
2. The control of the Mexican cotton boll weevil.
3. Cattle parasite investigations.

On account of the emergency nature of the sugar cane problem, it was decided early in the season that this project should receive primary attention and that, therefore, the major part of funds available and the time for workers should be devoted thereto.

SUGAR CANE BORER

The sugar cane borer is estimated by competent authorities to have destroyed 33% of the 1925 crop. This is the most serious damage ever sustained, but the average damage through a series of years preceding has been reported as approximately 20%. Even in seasons of exceptionally light infestation a loss of 10% is common.

The condition of the sugar industry is so precarious that every effort possible has been considered advisable in seeking to discover practicable means of reducing the damage from insect enemies. Consequently, this project has received nearly exclusive attention during the past season.

Cane borer investigations were started by the writers in the fall of 1925. Observations upon hibernation were continued through the winter and living borers could be found quite commonly in the larval stage hibernating in the scattered canes and thicker parts of the tops lying on the surface of the ground. The burning-off of trash had not destroyed nearly all of the larvae in the tops, and it would appear that the practice of burning trash does not in itself have any great importance in the problem of borer control. Whether the burning of trash is particularly significant in its effects upon the hibernation of the borer egg parasites (Trichogramma minutum) requires much further investigation. Undoubtedly this practice demands consideration from the agricultural standpoint.
The emergence of moths from the cane began after the middle of April apparently in all sections of the cane growing area. The first eggs appeared to have been laid about April 20 in the southern section and about April 30 in the vicinity of Baton Rouge. The first work of young borers was found on early planted corn and continued observations showed that the major part of the borers for both first and second generations are produced in corn, if corn is available. In the early part of the season, the principal sign of borer work on cane is the occasional "dead heart." On corn, the work of the young borers is much more easily found and appears in the form of very small perforations through the younger leaves especially. Typically some of these perforations are arranged in a series of four or five holes in a straight line across the blade of the leaf. This is due to the boring of the first stage larvae through the very tender leaf roll, and the holes are then spread out as the leaf unrolls. It is evident that corn is a more favorable host plant for the borers in early summer and that a larger percentage of the eggs laid on corn produce adult moths than is the case with cane. However, if no corn is grown, the moths simply lay all of their eggs on the cane and a higher infestation in the cane field is the result during the early part of the season.

In some garden patches of corn, the corn stalks were completely killed in many hills by the extremely heavy attack of the borers during the development of the first generation. As many as nineteen (19) pupae were taken from a single stalk of garden corn. The infestation in field corn is usually less concentrated than this. It has been found that over 90% of the borers in a field of corn may be removed by cutting out usually not more than 15% to 20% of the corn stalks. This infested corn may be fed out green to farm animals, or otherwise disposed of, so as to prevent the emergence of moths therefrom. It is evident that whatever corn is present may be utilized in this way for reducing the borer multiplication in the first two generations, and it appears probable also that the deliber-
ate planting of trap plats or rows of corn may prove to be an advisable and effective plantation practice for reducing the subsequent borer attack upon cane. This idea has already met with the approval of many planters and was applied to some extent in June, 1926.

The use of trap lights for capturing borer moths has been tested by many heretofore with unfavorable or entirely negative results. On the contrary, our own trap light tests conducted with incandescent lanterns principally has proven that many moths may be captured in this way. It has been found that the attractiveness of the light varies largely with its brilliancy. Ordinary kerosene lanterns were ineffective. The highest catch of cane borer moths at a single gasoline lantern was about one hundred and fifty (150) during a night. In many cases, no borer moths were secured because at that particular time the moths might not have been flying, although other species may have been very numerous. It is doubtful on the whole whether the number of moths destroyed through the use of trap lights was sufficient to render the practice advisable.

The borer attack on cane increases very rapidly with the maturity of the second generation moths which occurs at the time that the main crop of corn also matures. Thereafter, the principal host plant is cane, and the infestation therein rises rapidly. This happens usually about the last of July or first of August.

The egg parasite (Trichogramma minutum) is the principal natural enemy of the cane borer. It was found in 1926 that this egg parasite was breeding commonly during the early part of the summer in the eggs of the corn ear worm (Chloridea obsoleta) and in the eggs of the tomato sphinx moth (Deilephila lineata). In the comparatively large eggs of the latter species an examination showed that more than 77% of the eggs were parasitized and these produced an average of over twenty (20) parasites per egg. It was surprising that not a single parasitized borer egg
was found on either corn or cane until August 11 of the past season. Thereafter, as the borer infestation on cane increased, the parasite attack on borer eggs increased rapidly also. Numerous observations have indicated that the applications of sodium fluosilicate, as made for borer control, do not affect the parasites or prevent their emergence later from these parasitized eggs. Any control effect of the poison on the borers should, therefore, operate to increase the percentage of control resulting from the work of these egg parasites.

Life history observations have shown that five (5) generations developed during the season of 1926, the fifth generation larvae entering hibernation.

Insecticidal control work has been carried on on both corn and cane. Corn foliage has been found to be considerably more tender than cane and more susceptible to burning from poison applications. The principal poison used has been sodium fluosilicate (also called sodium silico-fluoride). Chemical analysis of these various materials have been made through cooperation with A. P. Kerr, chemist of the Experiment Station. It appears that the toxicity of these materials to the cane borer, and in general to corn and cane foliage as well, is in direct proportion to the percentage of the total fluorine content that is water soluble. There is evident need for a very careful and complete study of these chemical materials in both their chemical and physical properties. At present a wide variation exists in the properties of various materials sold under this name.

The applications of sodium fluosilicate to corn were made with hand dust guns and at the rate of approximately ten (10) pounds per acre. In a number of these tests from 50% to 75% of the borer larvae of all sizes, and even some of the pupae, were killed by these applications. It appears that this material acts both as a contact and a stomach poison. It is very encouraging to record that it is possible with any such material to kill even one-half (1/2) of the
full-grown borer larvae in their burrows in the basal portion of the dusted stalks.

During the season a very large amount of work was devoted to recording the conditions of borer infestation as they existed in various parts of the cane belt. These records will furnish valuable information for comparison with future observations. In a very large majority of the fields examined before the middle of August, less than 20% of the stalks showed any sign of borer attack, and in many localities the records showed less than 5% of infested stalks. These infestation records were necessary also as a basis for determining the most satisfactory location for the airplane dusting work contemplated. The most favorable location found up to August 20 was at Southdown Plantation, Houma, and the owners expressed their willingness to cooperate in a large-scale dusting experiment which might cover more than one thousand (1,000) acres of cane. Arrangements for this were practically completed when the severe Gulf storm of August 25 occurred. This storm changed the situation so greatly that it was necessary to examine again representative fields throughout the cane area for borer conditions and cane conditions before making final plans for the airplane work. The borer received a perceptible check as a result of the storm. Apparently most of the adults then active as well as most of the eggs and the larvae in first and second stages were destroyed during the storm, but larvae and pupae in the bases of the stalks were not affected. Therefore, moths emerged very soon after the storm was over and fresh eggs were found within two (2) days. From these eggs young stages appeared in due time.

Final arrangements for the airplane dusting work could be made only late in September. The plans then included an application to the cane growing at the Louisiana Sugar Experiment Station at Baton Rouge and a cooperative arrangement was entered into with A. Wilbert Sons & Company of Plaquemine whereby they bore the expense
required for poison used in treating twelve hundred (1200) or more acres of cane. The expense for the airplane service in applying this material was shared between the Louisiana Experiment Station and the Huff Daland Dusters, Inc., which concern did the dusting work for us. Our appreciation is due to both of these parties for their generous cooperation in this initial, large-scale airplane work.

The airplane dusting was begun at Baton Rouge on September 25, and the final applications were made at Plaquemine on October 20. During this series of tests some twenty-six (26) distinct tests were conducted covering practically thirteen hundred (1300) acres of cane and using about ten (10) tons of dust. In most of the work the dust swath spread quite satisfactorily over about one hundred (100) feet width. Most of the applications were made at the rate of from fifteen (15) to twenty (20) pounds of dust per acre. The number of acres treated per minute depends very largely upon the size of the fields and the relative proportion of time spent in actual discharge of the dust as compared with the time lost in turning between swaths. Under the most favorable conditions an actual coverage of twenty-five (25) acres in less than two (2) minutes was secured. The actual cost involved in such experimental work does not provide an adequate basis for determining a fair schedule of costs for future commercial work.

Following these airplane dusting applications, a very large amount of work was necessary to determine the results. A certain amount of leaf-burning was expected and was experienced with most of the materials used. However, this was not of any importance except with one of the new varieties of cane grown on a small area at the Experiment Station. In this case, the leaf-burning was quite extensive and caused a perceptible checking in the growth of the plants, although growth continued to the end of the season. No damage whatever to the cane eyes was noted except with this one exceptionally tender variety. Here the damage was less than 1% while the cane borer
larvae were causing an even higher percentage of damage at the same time.

The records showing the general effect of this one application were taken principally at from four (4) to six (6) days after the dust was applied to determine the effect upon the mortality of the borers. Under what may be considered "standard conditions", it appeared that the application destroyed more than 40% of all sizes of borer larvae within from five (5) to eight (8) days, and there is evidence of a continuing toxic effect for more than two (2) weeks. Therefore, the records as secured represent only a partial picture of the actual killing achieved. The smaller stages dried up and disappeared after five (5) or six (6) days, while larger larvae killed in their burrows would decompose and often become unrecognizable. Therefore, the percentages recorded in our tables must be considered as very conservative and, in fact, considerably less than the actual killing that occurred.

A second result from the dusting work could be measured in a comparison of the percentage of canes showing any borer attack and more accurately in the percentage of joints attacked in dusted areas as compared with similar cane, undusted. A third basis for comparison was found in the number of living borer stages per one hundred (100) canes examined. Naturally, such records as these had increasing value after time enough had elapsed for the development of the next generation of borers. Thus, the records taken from four (4) to six (6) weeks after the close of the dusting period became the final records for the season. The taking of these records continued until about the 20th of December. They required the careful cutting up and thorough examination of the entire canes from butt to leaf roll. The records secured are, voluminous and therefore we believe dependable.

A brief summary statement of some of the significant points is shown in the following table.
RESULTS OF AIRPLANE DUSTING WITH SODIUM FLUOSILICATE

<table>
<thead>
<tr>
<th>Variety</th>
<th>Treatment</th>
<th>No. Canes</th>
<th>% Joints</th>
<th>% Canes</th>
<th>Borers per 100 Canes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purple</td>
<td>Dusted</td>
<td>799</td>
<td>12.63</td>
<td>78.9</td>
<td>45.5</td>
</tr>
<tr>
<td>Purple</td>
<td>Check</td>
<td>597</td>
<td>23.79</td>
<td>95.1</td>
<td>78.2</td>
</tr>
<tr>
<td>Striped</td>
<td>Dusted</td>
<td>593</td>
<td>10.2</td>
<td>70.1</td>
<td>36.9</td>
</tr>
<tr>
<td>Striped</td>
<td>Check</td>
<td>197</td>
<td>27.4</td>
<td>98.0</td>
<td>66.0</td>
</tr>
<tr>
<td>D-74</td>
<td>Dusted</td>
<td>682</td>
<td>13.2</td>
<td>63.1</td>
<td>38.6</td>
</tr>
<tr>
<td>D-74</td>
<td>Check</td>
<td>200</td>
<td>28.7</td>
<td>91.5</td>
<td>76.5</td>
</tr>
<tr>
<td>D-95</td>
<td>Dusted</td>
<td>190</td>
<td>13.3</td>
<td>70.0</td>
<td>60.0</td>
</tr>
<tr>
<td>D-95</td>
<td>Check</td>
<td>200</td>
<td>32.6</td>
<td>98.4</td>
<td>75.0</td>
</tr>
<tr>
<td>Totals</td>
<td>Dusted</td>
<td>2264</td>
<td>12.08</td>
<td>70.84</td>
<td>41.2</td>
</tr>
<tr>
<td>Totals</td>
<td>Check</td>
<td>1194</td>
<td>30.13</td>
<td>95.78</td>
<td>80.1</td>
</tr>
</tbody>
</table>

Even a casual examination of the foregoing table shows clearly that there is a distinct and consistent difference in the infestation conditions following a single dust application. Probably the most significant figure is found in the column showing the percentage of infested joints. It will be seen that this figure is only two-fifths (2/5) as great in the dusted areas as in the undusted in an average of all varieties. The actual number of borer stages found is practically one-half (1/2) as many in the dusted as in the undusted cane. The numbers upon which these records are based are satisfactorily large, the general trend of the results is surprisingly uniform and consistent, and the three methods used in measuring the results agree substantially in their indications. Therefore, we believe that the conclusion is justified that even a single application of sodium fluosilicate applied properly and at a time when the borer infestation may justify it is quite certain to result in a substantial reduction of subsequent infestation and a very plain saving in the cane crop. This work resulted also in giving exceptionally clean, seed cane.

SUGAR CANE ROOT PESTS

In all sugar growing countries it has been found that
there are a number of soil-infesting insects and other forms of animal life, particularly snails, which may attack sugar cane roots. The damage done by such animals has never been studied very fully in the United States, although reference has been made to them by a number of investigators and the work of snails, especially, has been described by Rands (*) of the U. S. Sugar-Plant Investigations.

The principal one of these animals causing complaint in Louisiana is a small snail (Zonitoides arboreus Say), which is known to occur, widely distributed in the United States. The species has been found feeding on sugar cane roots, and is believed by some growers to be a serious factor in causing a restricted growth of the root system of some varieties of cane and of promoting the spread of various fungus diseases which are serious factors in cane production particularly in the oldest cane-growing areas.

Considerable attention has been devoted to a study of the snails particularly during the latter part of this season. Arrangements are now under way for extending these observations through the winter period under greenhouse conditions where the various animal species may be isolated in soil which has been previously sterilized and where their work may be observed specifically upon the fresh roots of recently planted cane. In this way, we hope that more definite information may be secured as to the nature of the feeding work done by each of these species and that we may be able to decide more positively as to the seriousness of the attack by each species and whether they are important agencies in the spread of pathogenic root diseases.

**BOLL WEEVIL CONTROL**

The principal subject of investigation continued with the boll weevil has been Hibernation Tests. In the fall of 1925, 13,295 weevils were placed in a number of hibernation cages on Experiment Station grounds. The emer-

(*) R. D. Rands, U. S. D. A. Dept. Cir. 366, 1926

"Root Disease of Sugar Cane in Louisiana"
gence of weevils from these cages began on February 16, 1926 and continued until June 12. During this period there occurred an emergence of 5.87% of the total number of weevils started. The crest of the emergence movement in 1926 did not occur until after the middle of May. Apparently the exceptionally cool, late spring of 1926 was responsible for this slow emergence in hibernation.

During October, 1926, an effort was made to secure weevils for another series of hibernation cages. It was found, however, that weevils were then extremely hard to get in the vicinity of Baton Rouge on account of the stripping of cotton by the cotton leaf worms which had occurred during September particularly. Therefore, only two (2) cages could be started and these included a total of only 816 weevils. Our emergence data in the spring of 1927 will be unusually limited at this Station.

No experimental poisoning work for weevil control was undertaken in 1926, but arrangements were made for the general dusting of Experiment Station cotton without reserving any areas for undusted check plats.

An experiment on the effect of various spacing distances upon the size and type of growth of cotton on river bottom soil on the Sugar Experiment Station grounds was undertaken in the hope that some definite information might result which would explain a very remarkable variation in cotton yields occurring in 1924 and 1925 on this same type of soil. In 1924, with a very dry season, a yield of more than 1600 pounds of seed cotton per acre was secured. In 1925, with the same variety of seed planted on an adjacent plat where a heavy growth of corn and cowpeas had been produced in 1924, and with a rainfall during June, July and August of 14.48 inches as compared with only 7.15 inches the preceding year, the cotton stalks made a remarkable vegetative growth, bloomed profusely and then shed practically its entire crop as small bolls. No cotton was picked here in 1926.

In the Cotton Spacing Tests on this bottom land, seed of Lone Star No. 65 was planted on June 26. The spacing
varied from unthinned (the stand being left as it grew from the planting) to a maximum of one (1) stalk per hill at approximately twenty-four (24) inches apart. The rows were spaced at an average of 3.7 feet apart. In this test no attempt was made to secure yield records beyond the counting of full-grown bolls about the first of October, at which time the work was closed and the cotton stalks plowed out to prepare for other fall planting.

Measurements of the height of plants, counts of the number of bolls per 100 row-feet and photographic records of typical plants found in each spacing were made. These records showed plainly that under the conditions of this test the widest-spaced plants were lowest in growth, but much more broad and heavily branched than close-spaced plants. Plants grown three (3) in a hill at a distance of twelve (12) inches apart grew to the maximum height and also produced the highest number of full-grown bolls per 100 row-feet. The unthinned cotton was intermediate in height with a very large proportion of dwarfed and fruitless stalks and with less than half the mature bolls to be found on the intermediate-spaced plants.

CATTLE PARASITE INVESTIGATIONS

This project was initiated October 1, 1925 under the immediate direction of Dr. Herbert Spencer. It was deemed advisable to discontinue this work temporarily after July 1, 1926 in order that Dr. Spencer might devote full-time to the more immediately urgent sugar cane borer investigations. In the short time that the project was under way, through routine examinations at the local Abattoir and by laboratory methods a satisfactory method was worked out for locating infested animals and for isolating specimens of the parasites in their various stages in much the same manner that is used in detecting human hookworm infestations. The primary object was to determine the parasites present, the species and stage identifications, and practicable methods of detecting, isolating and pre-
serving such material. Typical specimens were then pre-
erved for laboratory examinations. The status of this
work is such that it can be resumed at any time without
loss of headway.

SUGAR CANE EXTENSION and EXPERIMENT
STATION WORK

for

PERIOD of July 1st., to December 31st., 1926

C. B. Gouaux, Cane Specialist.
H. J. Rodriguez, Asst. Cane Specialist.

This division was established July 1st, 1926, under
the special appropriation of the Legislature for securing
and disseminating information on sugar cane problems.

Sugar Cane Extension Work

The main purpose of Sugar Cane Extension work, which is performed through the organization of specialists
and County Agents, is to conduct practical field sugar cane
demonstrations, involving modern agricultural methods
based on successful Experiment Station results; assist in
the solving of existing serious problems; disseminate ben-
eficial sugar cane information; and assist in working out a
profitable system of sugar cane agriculture.

The sugar planters of Louisiana are primarily interested
in the successful production of sugar cane. This means
producing profitable sugar and tonnage yields, and the
realization of net profits on the acres in cultivation. Our
sugar industry for a number of years has been very unprofitable. This condition has been occasioned by a combination of adverse circumstances, such as, serious damages from MOSAIC disease, ROOT ROT COMPLEX and RED ROT cane diseases, CANE BORERS, deterioration of the standard varieties, poor system of agriculture and unfavorable weather conditions. As a result many plantations that were at one time prosperous, have been entirely lost by the original owners, remained completely idle or have become heavily mortgaged or otherwise indebted. Unless the sugar business can be placed on a better basis, it will not be many years before it will be entirely lost as an industry in this state.

The Extension and Experiment Station workers are undivided in the opinion that in what is known as the cane territory of the state, sugar cane should continue to be the main money crop. They are exerting every effort towards solving the existing serious problems, and the reestablishment of the sugar industry. The following is an enumeration of the lines of work they are stressing in, based on Experiment Station results, the sugar parishes, through the work of the County Agents, and the cane specialist.

1. Utilization of new varieties;
2. Seed Cane Selection work;
3. Cane Borer Control;
4. Root rot complex control;
5. Land Preparation; involving deep plowing, good seed bed, good drainage, and the incorporation of summer legumes, preferably soy beans, in the land;
6. Melilotus indica, as a winter cover crop;
7. Fertilizer Demonstrations;
8. Cultivation Demonstrations;
9. Diversified Cane Farming.

**SUGAR CANE VARIETIES**

In all of the sugar parishes with County Agent representatives, the specialist was actively engaged in the fall distribution of the newly released varieties: POJ 36, 213 and 234. The agents cooperated with both the Experiment Station and the American Sugar Cane League in the distribution of these canes, and recommended the cooperating cane growers.

In some of the parishes, field inspection trips with cane growers were made to observe and compare plantings of the new cane varieties with the standard canes.

The planting on a field scale of the newly released varieties: POJ 234, 213 and 36, was especially stressed for the sections of the sugar belt, which showed the greatest amount of deterioration of the standard varieties, occasioned by the mosaic and root rot complex diseases.

**Seed Selection Work**

This important line of work was especially stressed in the northern and western parishes, where the Louisiana Purple and Striped canes made a fair showing. Field demonstrations were made, and a large number of cane growers were given instructions in the proper method of seed selection.
Seed selection demonstrations were performed with the following County Agents: E. S. Landry, St. Mary; C. C. Chapman, Ascension; G. C. Smith, East Baton Rouge; M. J. Voorhies, St. Martin; F. A. Swann, Avoyelles and F. M. Bacque, Lafayette. A total of fifty seed selection demonstrations is being conducted.

Root Rot Complex Control

A series of ten experiments, using Cyanamid as a repellant to fungi, soil animals and insects, has been started, with the cooperation of the American Cyanamid Company, in the following parishes:

Iberville 2, Vermilion 1, Lafayette 1, Terrebonne 1, West Baton Rouge 1, St. Mary 2 and Lafourche 1.

Fertilizer Demonstrations

Arrangements were made to conduct 27 fertilizer demonstrations, with the new cane varieties, using nitrate of soda and acid phosphate mixtures. This work is in cooperation with the Educational Bureau of Nitrate Agencies, and to be supervised by County Agents, without obligation to any commercial firm or person.

Diversified Cane Farming

The Extension service is devoting a good deal of attention to diversified cane farming, and good results are being obtained in some of the sugar parishes. The following crops are being used in the diversification program:

Cotton, rice truck crops, sweet potatoes, legumes and livestock.

Where diversified cane farming is being practiced in the sugar belt, the lands are in better shape, the growers are in better financial condition and better yields of cane are produced. This system of farming is practiced
extensively in the western parishes, and for the past few in the alluvial sections.

Cane Borer Control Work

Although the cane crop of 1926 was only slightly damaged by the serious cane borer pest, the planters are vitally interested in control measures for the cane borer. The method of spring control advocated by Dr. Hinds, is considered a good practical method by the sugar planters, and a step forward towards minimizing borer numbers. The Extension service rendered valuable assistance in demonstrating the method in the spring of 1926, and are planning another active campaign against the cane borers during the spring of 1927.

1926 Cane Situation

The 1926 sugar season in Louisiana was one of the shortest on record and showed the lowest production in a period of over fifty years. In the river and bayou parishes, where the D-74 variety is grown more extensively, the poorest yields were made, while the western and northern parishes, where the Louisiana Purple and Striped varieties are grown, produced a better crop. The new POJ 234 variety was planted mostly in small amounts throughout the sugar belt. In all of the localities, where observed during the season, it was much more advanced in growth than the D-74, and in most cases further advanced in growth than the Louisiana Purple and Striped. Under the existing circumstances, the POJ 234 stands out as a very promising variety of cane, and is worthy of being extended on field scale.

During the fall season, the other two released varieties, POJ 36 and 213, were planted in small and large acreages throughout the sugar parishes. This gives three new sugar cane varieties, which will be further extended over most of the sugar area for the 1928 crop. The Ex-
periment Station and U. S. Sugar Station have a number of other very promising varieties, which are being tested out on the Test Fields in the state, and if they prove out well, will be released and distributed.

There is a widespread interest among the sugar planters for establishing and propagating new and better varieties, which is a good thing, but on the other hand there is not enough interest manifested in securing a system of sugar cane agriculture, which will prevent a repetition, of the present disastrous situation. The program of work of the Extension service, based on the successful results of the Experiment Station, offers the best means of establishing the sugar industry on a safe, successful and profitable basis in Louisiana.

(Note by Director: Since this work is new, and there is much interest in all data on new canes, a much fuller report was requested than is given in older lines of work where detailed data are reserved for repetition and finally for publication in bulletin form.)

During the month of September, the six Experiment Station Test Fields, were placed under my supervision, with H. J. Rodriguez, as assistant in the work.

The Test Fields and their locations are as follows:
1. Angola. West Feliciana parish.
5. Sterling. St. Mary parish.

*At a meeting of the American Sugar Cane League, an arrangement was made by the Experiment Station and the U. S. Sugar Station for the exchange of the Raceland Test Field for Cinclare in West Baton Rouge parish.

Field Inspection Trips

Shortly after taking charge of the work, a tour of inspection of the Test Fields was made with Rodriguez.
## GINCLARE TEST FIELD

Planted October 24-25, 1926.

<table>
<thead>
<tr>
<th>Estate Harry J. Llewellyn</th>
<th>Ginclare-Sinnor Plantation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Back Headland</strong></td>
<td></td>
</tr>
<tr>
<td>P01</td>
<td>P02</td>
</tr>
<tr>
<td>118</td>
<td>777</td>
</tr>
<tr>
<td><strong>Middle Field</strong></td>
<td></td>
</tr>
<tr>
<td>P01</td>
<td>P02</td>
</tr>
<tr>
<td>226</td>
<td>34</td>
</tr>
<tr>
<td><strong>Front Headland</strong></td>
<td></td>
</tr>
<tr>
<td>P01</td>
<td>P02</td>
</tr>
<tr>
<td>115</td>
<td>179</td>
</tr>
</tbody>
</table>

**Site of Plat:** Left Here.

**Width of Field:** 2

**Length of Row:** 40 ft.
# Sterling Test Field

Planted November 13, 1926.

Sterling Sugar Inc. West Bellevue Plantation.

<table>
<thead>
<tr>
<th>Back Headland</th>
<th>Plot</th>
<th>Plot</th>
<th>Plot</th>
<th>Plot</th>
<th>Plot</th>
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<tr>
<td>Pot 1</td>
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<td>241 377 213 234 228 377 377 377</td>
<td></td>
<td></td>
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<td>Plot 9</td>
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<td>Plot 11</td>
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<td>Plot 13</td>
<td>Plot 14</td>
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<td>246 36</td>
<td>Pot 174 228 977</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Field Layout:

- 8 rows, 13.36 ft.
- 2 rows, 21.8 ft.

Front Headland:

Gravel Road To Sterling →

- Size of Plot = 2.5 Acre
- No. of Rows = 8
- Width of Rows = 6 ft.
- Length of Rows = 181 ft.
RESERVE TEST FIELD.

Planted October 28, 1926.

Godfrey Sugar Inc.

[Diagram showing a layout of a test field with various rows and planting positions marked with numbers and directions.]
In all of the places there were mixtures of varieties, some varieties incorrectly labeled, and general lack of cultivation and attention. In our regular visits during the season, we have endeavored and succeeded in correcting these undesirable conditions. The Angola and Sterling Test Fields were in the worst condition, and in the latter place no attempt was made to secure data during 1926.

On the field trips the following work was performed:

1. Notes on growth of varieties.
2. Sampling varieties for handmill tests.
3. Supervising and running mill tests of the most promising varieties.
4. Selecting new fields for planting.
5. Measuring and laying out plats.
6. Supervising seed cutting and planting.

**Test Field Plantings**

At a sugar planters meeting held at Glenwood plantation, Napoleonville, on October 8th., with representatives of the Experiment Station, the U. S. Sugar Station and American Sugar Cane League, a standard plan for testing sugar cane varieties on the Test Fields of the Experiment Station and U. S. Sugar Station was adopted. It was decided to use the following varieties: POJ 36, 213, 228, 234, 826, 979, 2379 and D-74 and Louisiana Purple selected. In addition it was decided to make the plantings in 3 row plats, one-twentieth of an acre in size, checker-board system, with replications of each variety varying from 4 to 10.

The following method for running mill tests of the varieties was adopted:

1. Minimum of 4 tons to be used in test, without maceration.
2. In Crusher Juice: determine Brix, Sucrose and Purity.

5. In Bagasse: determine Sucrose, Moisture and Fiber. Handmill tests to be run at regular intervals, starting in October and extending throughout the grinding season.

Handmill Tests

During the months of October and November, representative samples of cane (3 to 5 stalks), of the Test Field varieties, both plant and stubble cane, were taken, and handmill tests made. On the following Test Fields: Angola, Reserve, Raceland, Glenwood and Youngsville, from two to three series of handmill tests were performed.

Fall Plantings of Test Fields

The fall plantings were made on the following Test Fields, according to the new plan adopted: Glenwood, Reserve, Cinclare, Sterling and Youngsville. The sketches, contained in this report give the details of planting layout of each Test Field.

Mill Tests

In order to obtain information on the milling qualities of some of the new and most promising varieties, two series of mill tests were conducted. The first series was conducted at Glenwood, from plant cane Test Field varieties, on November 22nd. The second series of mill tests was conducted at Reserve, from plant cane Test Field varieties, on November 27th. Copies of the results of these mill tests are attached to this report.

FIELD INSPECTION OBSERVATIONS

Test Field  Most Outstanding Varieties.
Glenwood.  POJ 234, 36, 228, 826,
            2379, (979 badly storm damaged)
US 1444 and 1436.
Reserve POJ 234, 213, 228, 826, 2379 and (979 badly storm damaged) US 1444 and 1712.
Raceland. POJ 234, 213, 228, 826, 2379 and (979 badly storm damaged) US 1444 and 1712.
Youngsville. POJ 213, 228, 826, 36. 234, 139 and 979 (slightly storm damaged.)

**TIME REPORT**

Days in Field 106. Days in office 43
Days Annual Leave 5. Total Mileage traveled 6248

**RESERVE TEST FIELD**

**MILL TESTS OF SUGAR CANE VARIETIES**

Godchaux Sugars Inc., Reserve, La. Nov. 27, 1926

<table>
<thead>
<tr>
<th>Variety</th>
<th>Juice</th>
<th>Brix.</th>
<th>Sucrose</th>
<th>Purity</th>
<th>Gluc-</th>
<th>Acid-</th>
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</thead>
<tbody>
<tr>
<td>POJ 234—Crusher</td>
<td>15.57</td>
<td>12.27</td>
<td>78.81</td>
<td>1.3</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>POJ 234—Mixed</td>
<td>14.63</td>
<td>11.03</td>
<td>75.39</td>
<td>1.6</td>
<td>1.4</td>
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</tr>
<tr>
<td>POJ 234—Residual</td>
<td>13.69</td>
<td>9.45</td>
<td>69.03</td>
<td>1.6</td>
<td>1.9</td>
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<tr>
<td>POJ 228—Crusher</td>
<td>14.47</td>
<td>10.37</td>
<td>71.66</td>
<td>1.4</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>POJ 228—Mixed</td>
<td>14.32</td>
<td>10.10</td>
<td>70.53</td>
<td>1.6</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>POJ 228—Residual</td>
<td>13.99</td>
<td>9.19</td>
<td>65.69</td>
<td>1.7</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>POJ 213—Crusher</td>
<td>15.69</td>
<td>11.27</td>
<td>71.83</td>
<td>1.8</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>POJ 213—Mixed</td>
<td>15.34</td>
<td>10.18</td>
<td>66.36</td>
<td>1.9</td>
<td>1.2</td>
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</tr>
<tr>
<td>POJ 213—Residual</td>
<td>15.09</td>
<td>9.12</td>
<td>60.44</td>
<td>2.3</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>La. Purple Crusher</td>
<td>14.63</td>
<td>10.97</td>
<td>74.98</td>
<td>1.5</td>
<td>0.6</td>
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<tr>
<td>La. Purple Mixed</td>
<td>14.43</td>
<td>10.54</td>
<td>73.04</td>
<td>1.6</td>
<td>0.9</td>
<td></td>
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<tr>
<td>La. Purple Residual</td>
<td>14.34</td>
<td>9.76</td>
<td>68.06</td>
<td>1.7</td>
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BAGASSE ANALYSIS

<table>
<thead>
<tr>
<th>Variety</th>
<th>% Bagasse</th>
<th>Sucrose</th>
<th>Moisture</th>
<th>% Fiber In Cane</th>
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<tr>
<td>POJ—234</td>
<td>30.89</td>
<td>3.84</td>
<td>48.5</td>
<td>14.19</td>
</tr>
<tr>
<td>POJ—228</td>
<td>27.97</td>
<td>3.70</td>
<td>48.0</td>
<td>12.97</td>
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<tr>
<td>POJ—213</td>
<td>34.05</td>
<td>3.70</td>
<td>47.0</td>
<td>15.96</td>
</tr>
<tr>
<td>La. Purple</td>
<td>26.70</td>
<td>3.98</td>
<td>48.8</td>
<td>12.11</td>
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AVAILABLE SUCROSE YIELDS

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<th></th>
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<th></th>
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<tbody>
<tr>
<td>POJ—234</td>
<td>5940</td>
<td>4105</td>
<td>1382.15</td>
<td>69.11</td>
<td>129.9</td>
<td>2143</td>
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<tr>
<td>POJ—228</td>
<td>9440</td>
<td>6800</td>
<td>1440.68</td>
<td>72.03</td>
<td>118.76</td>
<td>2002.3</td>
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<tr>
<td>POJ—213</td>
<td>3980</td>
<td>2625</td>
<td>1319.09</td>
<td>65.96</td>
<td>104.9</td>
<td>1490.6</td>
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<tr>
<td>La. Purple</td>
<td>8520</td>
<td>6245</td>
<td>1465.96</td>
<td>73.3</td>
<td>129.07</td>
<td>1409.4</td>
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RESERVE TEST FIELD. (Continued).

MILL TESTS OF SUGAR CANE VARIETIES.

Godchaux Sugars Inc., Reserve, La.    November 27, 1926

CALCULATED ACRE YIELDS

<table>
<thead>
<tr>
<th>Variety</th>
<th>Tons Cane Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>POJ 234</td>
<td>16.50</td>
</tr>
<tr>
<td>POJ 228</td>
<td>16.86</td>
</tr>
<tr>
<td>POJ 213</td>
<td>14.21</td>
</tr>
<tr>
<td>La. Purple</td>
<td>10.92</td>
</tr>
</tbody>
</table>

Some of the canes in this plat had been removed.

Note: Sucrose calculated on extraction shown by each variety, and B. H. E. of 98, using Java formula. No maceration used on mills. Fiber determined by calculation.

These mill tests were conducted under the supervision of Mr. J. P. Grevens, Manager Reserve Factory and Mr. F. J. Gayle, Chief Chemist, Reserve Factory.
### GLENWOOD MILL TEST

November 22, 1926

<table>
<thead>
<tr>
<th>Variety</th>
<th>Juice</th>
<th>Brix</th>
<th>Sucrose</th>
<th>Purity</th>
</tr>
</thead>
<tbody>
<tr>
<td>POJ 228</td>
<td>Crusher</td>
<td>13.96</td>
<td>10.03</td>
<td>71.8</td>
</tr>
<tr>
<td>POJ 228</td>
<td>Mixed</td>
<td>13.47</td>
<td>9.34</td>
<td>69.6</td>
</tr>
<tr>
<td>POJ 228</td>
<td>Residual</td>
<td>13.33</td>
<td>8.51</td>
<td>63.8</td>
</tr>
<tr>
<td>POJ 36</td>
<td>Crusher</td>
<td>13.25</td>
<td>9.51</td>
<td>71.07</td>
</tr>
<tr>
<td>POJ 36</td>
<td>Mixed</td>
<td>13.30</td>
<td>9.34</td>
<td>70.02</td>
</tr>
<tr>
<td>POJ 234</td>
<td>Residual</td>
<td>13.19</td>
<td>8.56</td>
<td>64.90</td>
</tr>
<tr>
<td>POJ 234</td>
<td>Crusher</td>
<td>14.53</td>
<td>11.58</td>
<td>79.6</td>
</tr>
<tr>
<td>POJ 234</td>
<td>Mixed</td>
<td>14.59</td>
<td>11.34</td>
<td>77.7</td>
</tr>
<tr>
<td>POJ 234</td>
<td>Residual</td>
<td>14.63</td>
<td>10.55</td>
<td>72.1</td>
</tr>
<tr>
<td>POJ 826</td>
<td>Crusher</td>
<td>13.85</td>
<td>9.88</td>
<td>71.3</td>
</tr>
<tr>
<td>POJ 826</td>
<td>Mixed</td>
<td>13.71</td>
<td>9.47</td>
<td>69.07</td>
</tr>
<tr>
<td>POJ 826</td>
<td>Residual</td>
<td>13.53</td>
<td>8.65</td>
<td>63.93</td>
</tr>
<tr>
<td>POJ 2379</td>
<td>Crusher</td>
<td>13.05</td>
<td>8.23</td>
<td>63.06</td>
</tr>
<tr>
<td>POJ 2379</td>
<td>Mixed</td>
<td>12.87</td>
<td>8.13</td>
<td>63.20</td>
</tr>
<tr>
<td>POJ 2379</td>
<td>Residual</td>
<td>12.93</td>
<td>7.91</td>
<td>61.20</td>
</tr>
<tr>
<td>Cayana 10</td>
<td>Crusher</td>
<td>13.05</td>
<td>8.58</td>
<td>65.70</td>
</tr>
<tr>
<td>Cayana 10</td>
<td>Mixed</td>
<td>13.37</td>
<td>8.57</td>
<td>64.00</td>
</tr>
<tr>
<td>Cayana 10</td>
<td>Residual</td>
<td>13.42</td>
<td>7.85</td>
<td>58.40</td>
</tr>
<tr>
<td>D—74*</td>
<td>Crusher</td>
<td>13.07</td>
<td>9.70</td>
<td>74.2</td>
</tr>
<tr>
<td>D—74*</td>
<td>Mixed</td>
<td>13.24</td>
<td>9.84</td>
<td>74.3</td>
</tr>
<tr>
<td>D—74*</td>
<td>Residual</td>
<td>12.99</td>
<td>9.08</td>
<td>69.9</td>
</tr>
<tr>
<td>Native (Dry)</td>
<td>Crusher</td>
<td>13.26</td>
<td>9.81</td>
<td>74.1</td>
</tr>
<tr>
<td>Native (Dry)</td>
<td>Mixed</td>
<td>13.07</td>
<td>9.77</td>
<td>74.5</td>
</tr>
<tr>
<td>Native (Dry)</td>
<td>Residual</td>
<td>12.70</td>
<td>9.24</td>
<td>72.80</td>
</tr>
<tr>
<td>Native (Wet)</td>
<td>Crusher</td>
<td>12.83</td>
<td>9.40</td>
<td>73.2</td>
</tr>
<tr>
<td>Native (Wet)</td>
<td>Mixed</td>
<td>12.17</td>
<td>8.94</td>
<td>73.5</td>
</tr>
<tr>
<td>Native (Wet)</td>
<td>Residual</td>
<td>8.63</td>
<td>5.80</td>
<td>67.2</td>
</tr>
<tr>
<td>POJ 979*</td>
<td>Crusher</td>
<td>13.43</td>
<td>9.36</td>
<td>69.6</td>
</tr>
<tr>
<td>POJ 979*</td>
<td>Mixed</td>
<td>13.60</td>
<td>9.34</td>
<td>66.3</td>
</tr>
<tr>
<td>POJ 979*</td>
<td>Residual</td>
<td>14.03</td>
<td>9.62</td>
<td>68.6</td>
</tr>
</tbody>
</table>

* Large percentage of storm broken stalks in cane milled.
GLENWOOD MILL TEST. (Continued)

<table>
<thead>
<tr>
<th>Variety</th>
<th>Bagasse % Water</th>
<th>% Fiber</th>
<th>Tons Cane In Test</th>
<th>Available Sucrose Per Ton Cane</th>
</tr>
</thead>
<tbody>
<tr>
<td>POJ 228</td>
<td>45.6</td>
<td>49.7</td>
<td>3.85</td>
<td>119.4</td>
</tr>
<tr>
<td>POJ 36</td>
<td>52.67</td>
<td>32.48</td>
<td>2.56</td>
<td>119.1</td>
</tr>
<tr>
<td>POJ 234</td>
<td>55.8</td>
<td>38.60</td>
<td>3.72</td>
<td>154.1</td>
</tr>
<tr>
<td>POJ 826</td>
<td>51.08</td>
<td>44.55</td>
<td>2.68</td>
<td>119.9</td>
</tr>
<tr>
<td>POJ 979</td>
<td>60.72</td>
<td>34.52</td>
<td>1.36</td>
<td>110.5</td>
</tr>
<tr>
<td>POJ 2379</td>
<td>60.30</td>
<td>35.75</td>
<td>1.66</td>
<td>95.6</td>
</tr>
<tr>
<td>Cayana 10</td>
<td>44.74</td>
<td>50.06</td>
<td>4.83</td>
<td>101.7</td>
</tr>
<tr>
<td>D-74</td>
<td>55.8</td>
<td>39.05</td>
<td>4.58</td>
<td>131.0</td>
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<tr>
<td>Native</td>
<td></td>
<td></td>
<td></td>
<td>129.7</td>
</tr>
</tbody>
</table>

Note: Bagasse brought to Baton Rouge for analysis, and fermentation set in before sucrose could be determined.

The varieties showed up best from a milling standpoint, in the following order:

1. D-74 and Native.
2. POJ 234.
3. Cayana.
4. POJ 36.
5. POJ 228, 826, 979 and 2379.

(With Entomology)

Projects of Investigations of Insects Affecting Truck Crops in Louisiana, 1926, by

Chas. E. Smith, Assistant Entomologist,
Norman Allen, Junior Entomologist,
of
U. S. Department of Agriculture,
Bureau of Entomology, In Cooperation with
Louisiana Experiment Stations,
Baton Rouge, Louisiana.

Two species of insects that affect truck crops, namely; the spotted cucumber beetle and the tomato fruitworm constituted the principal projects in 1926. Other insects affecting these crops that receive minor attention were red spi-
ders on strawberries, and belted cucumber beetle, blister beetles, thrips, plant lice and cutworms.

The studies of the spotted cucumber beetle were conducted in both the field and laboratory and consisted of observations on its life history, seasonal abundance, environmental factors affecting the species in various ways, natural enemies, and natural and artificial means of control. Observations to date indicate that there is but one major brood produced per year and the greatest amount of damage done by the adults or beetles is caused by those that are present in the field during the winter and early spring with less amount being caused by the early brood in the spring soon after emerging. Practically all of the larval injury is caused by those present in the field in early spring, the extent and time of which depending largely upon weather conditions, while there are other factors of minor importance. Sodium fluosilicate has shown up favorably in insecticidal tests conducted on the control of the species. Some progress has been made with the use of certain crops planted as traps for the beetles which are designed for use before the egg laying starts for the destructive spring brood of larvae.

The observations on the tomato fruitworm have consisted largely of studies of control measures, both natural and artificial, seasonal habits and food plants. Several dilutions of lead arsenate and calcium arsenate and sodium fluosilicate were tested on tomatoes for the protection of the fruits. Moderately satisfactory results were obtained from the arsenicals, while the sodium fluosilicates were unsatisfactory due to the ineffective controls obtained with the weaker dilutions and the severe injury to the foliage and fruits by the stronger strengths. Several parasites and predators have been found and aid considerably in keeping the species in check. A parasitic fungus, an Entomophthora, killed a very large percentage of these worms that were in the field during the fall of 1926. A number of different preparations were tested as baits and traps, including lights for catching the moths, all of which
gave practically negative results. However, the moths of several species of economic importance were captured in worthwhile numbers, among which several species of cutworm moths were represented.

The observations made on the species receiving the minor attention and mentioned above consisted largely of making notes on field conditions which will be of value when the problems are taken up for a more detailed study.

**Fertilizer and Feed Stuffs Laboratory.**

For analysing samples of fertilizer and feed stuffs and insecticides collected by the State Department, in the administration of laws on fertilizer feed stuffs and insecticides.

A. P. Kerr, Chief Chemist.
J. H. Jolly, Ass't. Chemist.
J. L. Farr, Ass't Chemist.
W. P. Denson, Ass't Chemist.

This work is supported by funds received from the sale of tags for guaranteeing fertilizer, feed stuffs and insecticides.

The Experiment Station laboratory has made all analyses of feeds, fertilizers and insecticides for the State Department of Agriculture. The laboratory analysed 1057 fertilizer samples and 1075 feed samples the past season. The detailed reports of these analyses are printed in full in bulletin form, and distributed to a large number of farmers and merchants.

There was in addition to the regulatory work, the usual amount of miscellaneous samples of feeds, soils, water etc., for analysis.

The laboratory is called upon from time to time to make soil analysis for farmers of this State. As there are so many outside factors that have to be taken into consideration, an analysis of a soil without any other information means very little, either to the farmer or to the Experiment Station. There is no justification for the popular idea that the soil analysis will clearly indicate what fertilizers may be used to best advantage.
## FINANCIAL REPORT OF THE AGRICULTURAL EXPERIMENT STATIONS
### LOUISIANA STATE UNIVERSITY
### FROM JANUARY 1, 1926, TO DECEMBER 31, 1926

<table>
<thead>
<tr>
<th>DR.</th>
<th>Hatch Fund</th>
<th>Adams Fund</th>
<th>Purnell Fund</th>
<th>State Fund</th>
<th>Fertilizer Fund</th>
<th>Feed Stuffs</th>
<th>Sugar Cane Fund</th>
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<td>Balance, Jan. 1, 1926</td>
<td>$15,000.00</td>
<td>$7,643.98</td>
<td>$2,674.75</td>
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<td>U. S. Treasurer</td>
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<td>Refunds</td>
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<td>Interest on Daily Balance</td>
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<td>La. Highway Commissioner</td>
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<td>Commissioner of Agriculture (Less Amount transferred to State Fund)</td>
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<td>$28,880.76</td>
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<td>Transferred from Fertilizer Fund</td>
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<td><strong>4,154.80</strong></td>
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<tr>
<td>Total Receipts</td>
<td>$15,000.00</td>
<td>$15,763.98</td>
<td>$27,674.75</td>
<td>$60,355.20</td>
<td>$29,062.11</td>
<td>$15,241.65</td>
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<tr>
<td>*Loan from Bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$19,531.15</td>
</tr>
<tr>
<td>Total</td>
<td>$15,000.00</td>
<td>$15,763.98</td>
<td>$27,674.75</td>
<td>$60,355.20</td>
<td>$29,062.11</td>
<td>$15,241.65</td>
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<tr>
<td>Overdraft, Dec. 31, 1926</td>
<td>1,898.74</td>
<td></td>
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<td></td>
<td>$3,787.43</td>
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<tr>
<td>Total Receipts, Loan and Overdraft</td>
<td>$16,898.74</td>
<td>$15,763.98</td>
<td>$27,674.75</td>
<td>$83,673.78</td>
<td>$29,062.11</td>
<td>$15,241.65</td>
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### CR.

<table>
<thead>
<tr>
<th>Hatch Fund</th>
<th>Adams Fund</th>
<th>Purnell Fund</th>
<th>State Fund</th>
<th>Fertilizer Fund</th>
<th>Feed Stuffs</th>
<th>Sugar Cane Fund</th>
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<tr>
<td>Salaries</td>
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<td>$11,269.18</td>
<td>$15,803.40</td>
<td>$17,513.91</td>
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<td>937.90</td>
<td>1,662.73</td>
<td>24,895.49</td>
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<tr>
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<td>70.15</td>
<td>137.32</td>
<td>69.64</td>
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<td>Scientific Supplies</td>
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<td>79.98</td>
<td>467.70</td>
<td>337.21</td>
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<td>Feed Stuffs</td>
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<td>54.25</td>
<td>7.73</td>
<td>483.68</td>
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<td>125.28</td>
<td>359.51</td>
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<td>Fertilizer</td>
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<td>Transportation of Things</td>
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*Loans and Overdrafts were in anticipation of monies appropriated and are not expenditures in excess of appropriations. Refunds are not an actual receipt, being mainly money re-funded for travel expenses advanced.