SIXTY-FIFTH ANNUAL REPORT
of the
BOARD OF TRUSTEES
of
THE CLEMSON AGRICULTURAL COLLEGE
to the
GENERAL ASSEMBLY OF SOUTH CAROLINA
1954

RECORD
The Clemson Agricultural College
LETTER OF TRANSMITTAL

Members of the General Assembly
Columbia, South Carolina

Gentlemen:

In behalf of the trustees of The Clemson Agricultural College, we are pleased to transmit herewith for your consideration the report of President R. F. Poole for the fiscal year July 1, 1953 to June 30, 1954.

The Board advises with pleasure fine progress at Clemson College.

Respectfully submitted,

R. M. Cooper
President, Board of Trustees

December 1, 1954
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I have the honor to present to you the sixty-fifth report of the President of Clemson College.

The esprit de corps of the faculty remains good. The faculty has been most helpful with the students, especially in counseling the freshmen. An organized counseling system for the freshmen seems to be proving successful. The general attitude of the students is good, and the restlessness seen in other years since the war appears to be disappearing.

We have new buildings that will require more money for maintenance, and money will be needed to keep the old buildings in repair.

We have not had sufficient money to move as we should into the graduate field of instruction where training in research and the continued education of our graduates would give the state well trained men so needed in these times. I think an obligation rests with the state to encourage a strong graduate program at Clemson, especially now that for the first time in the state’s history there is a worthy movement towards utilizing the potential human and natural resources of the state. The college has been helped materially in recent years by government and businesses interested in promoting research.

In addition to the reports of the public service activities, I am including short statements regarding the activities of the various schools and departments of the college.
The Registrar's Office shows a total of 2,690 students enrolled for the first semester. This is 59 less than the 2,749 enrolled last year but 140 greater than the preliminary estimate of 2,550.

New students enrolled this fall amount to 848 including 44 who entered in June and 804 who entered in September. Last year there were 794 new students including 50 who entered in June and 744 who entered in September.

The enrollment this year shows an increase in veterans and a continuation of the trend toward engineering courses. The veterans have increased from 368 last year to 527 this year; and the enrollment in the School of Engineering has consistently increased each year from 31.2 percent of all undergraduate students in 1950-51 to 42.2 percent this year.

The Army and Air Force commissioned a total of 211 Clemson graduates at the end of the spring and summer semesters.

The counseling system, increased study hall facilities for freshmen, and a much needed reduction in teaching load have all contributed to the improvement of scholarship. More direct in its effects on the performance of students has been the raising of the quality standards for graduation, classification, and admission to the Advanced ROTC. Excusing superior students from examinations has also been a very effective incentive.

The reorganization of the School of Agriculture with Dr. M. D. Farrar as Dean became effective July 1, 1953. The teaching activities were then placed under the supervision of Dr. J. W. Jones, who was appointed to the new position of Director of Agricultural Teaching. The coordination of the South Carolina Experiment Station, the South Carolina Extension Service, and the Livestock Sanitary work under the School of Agriculture has been most satisfactory. Reports of the Heads of these various Divisions indicate progress and new activities for the future. The Fertilizer Inspection and Analysis work and the Crop Pest activities are reported under the Experiment Station.
The new agricultural buildings are nearing completion and will add materially to the opportunities for developing greater agricultural programs in the future.

Directors of resident teaching in the schools of agriculture of the Southern Land-Grant colleges are preparing a series of color slides to show employment opportunities for college agricultural graduates. Eight broad areas of employment have been classified, and South Carolina was assigned the area of farm production. Over 200 Kodachrome slides were made in this state during the summer. These slides are to be used in conjunction with a brochure on "Opportunities in Agriculture."

The Director of Agricultural Teaching is serving on a regional committee appointed to study recruitment procedures used in Land-Grant institutions.

Recently the Board of Trustees approved the establishment of a new curriculum in wildlife management as Clemson College is in a favorable position to offer this work.

Four of the agricultural economics teachers served on examining committees for graduate students during the summer. The Department of Agricultural Engineering now leads the nation in enrollment of students in the agricultural engineering major. The Department of Animal Husbandry has the largest number of major students in the School of Agriculture. Interest in the poultry curriculum is increasing along with the growth of the poultry industry in the state. Two new graduate courses have been added in the Department of Animal Husbandry, one on methods in animal breeding and one on nutrition of meat animals.

An agricultural fair was held at Clemson November 21-22, 1953, with exhibits prepared by students with the aid of faculty advisers. The fair attracted considerable attention and was of much value to the students.

A dairy cattle judging team composed of senior students in dairying won the 1953 Southern Intercollegiate Cattle Judging Contest. The first milk plant fieldmen's conference to be held at Clemson was directed by the Dairy Department staff March 17-18, 1954, with 14 milk plants represented.
In the School of Arts and Sciences, the work and staff are well organized and began the year with almost the same staff as last year. Classes are so organized that in general class size is in the twenties for efficient handling.

Members of the staff have been generally active during the summer. At least nine were engaged in formal study; three were engaged in research projects for government agencies; 28 taught in the Clemson summer school; one taught in a college in a nearby state; several worked on their Ph.D. dissertations; and several others did active tours of duty with the Army or Navy.

The Department of English has sponsored public speaking competition for the Trustees' Medal and has had this year what it regards as the highest caliber of competition in recent years. Professor John D. Lane has published two attractive booklets entitled "Who or Whom?" and "Between You and Me" to be used as teaching devices; and Dr. C. B. Green is preparing to publish a book resulting from his dissertation study. Members of the staffs of other departments in the school also are engaged in various beneficial activities.

The School of Chemistry and Geology has built up its teaching staff and improved its curricula, and is functioning most effectively in its excellent new building. As of July 1, 1954, nine members of its permanent staff have their Ph.D. degrees and only two do not have them.

The total number of students taking chemistry courses during the summer session was the largest since right after the war. This indicates a very healthy trend. It has been necessary to use seniors this fall as laboratory assistants and even so the number of students per instructor has been larger than should be for satisfactory instruction. Hence additional funds are being sought for six more graduate assistants to help out with the increased teaching load of 975 students in freshman chemistry.

During the past summer excellent laboratories for instrumental analysis and qualitative organic analysis were equipped and are now in full operation. A modernization of the analytical work
will necessitate finishing off one more laboratory on the second floor, with funds still left in the General Education Board grant.

The School of Education, in the preparation of young men for teaching vocational agriculture, industrial arts, manual training, trades and industries, etc., reaches virtually every rural and industrial community in South Carolina that has a high school. In some schools as many as five teachers are Clemson graduates. The faculty of the school is supplemented from time to time by leaders from this area and from such institutions as the University of Pittsburgh, Syracuse University, Pennsylvania State University, and the Utah State Department of Education.

During the spring of 1954 the Clemson Area Citizens' Education Center was held at Clemson through the cooperation of the School of Education, the State Department of Education, local and county school authorities, organizations, clubs, and individuals. Eighteen courses were given and 1,155 adults from the area were enrolled in a wide range of courses. The results were very gratifying and plans are under way for a continuation of this work again this year.

The Agricultural Education Department conducted courses for agricultural teachers during the past summer; and a class in training high school counselors was given with the assistance of experienced principals and teachers. The department has also a follow-up program for new agricultural teachers.

Members of teacher-training departments held meetings with 225 white teachers and 100 Negro teachers and discussed new developments in technical agriculture.

The school's itinerant teacher-trainer conducts programs of training for foremen and executives in order to help their personnel and improve technical skills in industry.

Livestock judging groups and Young Farmer groups meeting at Clemson also receive aid and cooperation from the School of Education in connection with their meetings.
In the **School of Engineering**, the enrollment continues to increase and most departments are finding great difficulty in classroom and laboratory space to take care of the teaching requirements. Clemson has the best equipped engineering school in the state, and more and more students want to come here to take engineering. To meet this demand we must provide additional facilities.

The graduate program in ceramic engineering is off to a good start with three graduate students, Professor G. C. Robinson, head of this department, has been elected vice-chairman of the structural clay products division of the American Ceramic Society. Recently the Western Electric Company made available a number of instruments which had been used by the company on research work. We were fortunate also to receive valuable direct current indicating machines which will be very useful.

Professor J. E. Shigley is completing work on a textbook on machine design, and we hope that it will add prestige to the School of Engineering as well as benefit him personally. He has done much to inspire the staff in a number of ways for several years.

The Chrysler Corporation, Dodge Division, has donated a new Dodge 8-cylinder engine to the combustion engine laboratory, adding a modern piece of equipment to our instructional facilities.

Dr. C. E. Littlejohn's studies on utilization of fly ash have been published as Bulletin No. 6 of the Engineering Experiment Station; and he is continuing his research to determine the economic feasibility of the recovery of certain metals from fly ash.

The work on design of saw teeth has been continued this year under Messrs. Shigley, Banister, McHugh, and Bradbury, with some interesting results.

Another pamphlet, "A Career in Ceramic Engineering," has been prepared and has received wide distribution. Various research studies in ceramics are being conducted; and a pamphlet on "The Mineral Resources of South Carolina" has been widely distributed to school children.

A large number of research projects is being conducted by members of the several departments of the School of Engineering, strengthening the school's prestige.
In the School of Textiles, the enrollment, though down slightly, was still about 22 percent of the total textile enrollment, in the United States; and the demand for our graduates continues to greatly exceed the number of graduates we have.

During the summer session, all of the teachers who did not teach were employed, if they desired, on research projects financed from government and commercial projects and the Sirrine "extra professor" funds.

The school has in force five undergraduate scholarships totaling $2400, and two active graduate fellowships.

Several publications have been made by staff members, and a large mill visitation program has been possible with the college and Sirrine travel funds.

Dean Brown has been elected treasurer of the Fiber Society and to membership in the Steering Committee of the Textile Division of the American Society for Testing Materials. There have been several donations of useful equipment during the year.

A dozen or more new contract research projects have been undertaken, with a total value of $73,157.29. It is gratifying that as government contracts are diminishing, more contracts from industry are being received.

The Library reorganization on the divisional plan was completed during last summer. This plan puts all books and periodicals on science and technology in one division on the second floor and balcony of the library, and those in social sciences and humanities in another division on the first floor. Work on another division of agricultural reference is in progress, and an inventory of all books has been made with the exception of those on agricultural reference. Various changes have been made or are being made by Library Director Gourlay for greater convenience and efficiency.

The Department of Public Relations and Alumni Affairs has continued to increase the scope and effectiveness of its work. More news releases and publicity have been distributed in a recent three months period than ever before. There is fine cooperation and co-
ordination from all departments of the college in helping to prepare release material.

With the addition of Robert C. Bradley as associate director, the department has been able to concentrate more on alumni activities than in the past. The department also seeks to maintain a closer relationship with the students of the college in an effort to keep them well informed, which will help to insure good morale in the student body.

The Graduate School enrollment for the past year has been about the same as in past years, but the number of advanced degrees awarded in the year 1953-54, totaling 29, is the largest since the inauguration of graduate work at Clemson.

Some progress has been made during the year toward offering the Doctorate, the requirements for which have been established, and a study is being made as to what extent the instructional program must be developed for this purpose.

The general efficiency of the graduate program has been satisfactory. The strength of the program in animal husbandry has been greatly improved; the physics group has done an excellent job of developing their research equipment through the Kress funds and other sources; and it appears now that there will be five new graduate assistants in chemistry next year.

There seems at present more interest on the part of qualified undergraduates towards graduate work in the technical fields than has been true in the past few years.

\[R. T. Poole\]

President
THE CLEMSON AGRICULTURAL COLLEGE

REPORT OF THE TREASURER

A. J. Brown, Secretary-Treasurer

THE CLEMSON AGRICULTURAL COLLEGE OF SOUTH CAROLINA

COLLEGIATE ACTIVITIES

Fiscal Year July 1, 1953 to June 30, 1954

INCOME

Legislative Appropriations:

(Revenue from operation of Clemson College Transmitted to State of South Carolina)

Tuition & Matriculation Fees
- Session 1953-1954 $282,223.09
- From Other State Funds 1,648,623.91

Total Legislative Appropriation $1,930,847.00

Federal Funds 45,558.86
Endowment Funds 9,266.36
Miscellaneous — Rents, Sales & Service 105,631.97

Student Fees:

- Laboratory Fees $122,746.95
- Class Maintenance Fees 43,196.82
- Summer School 1953 11,449.41
- Summer School 1954 65,626.81 243,019.99

Sales and Service Collegiate Departments 423,838.80
Auxiliary Enterprises $1,288,183.20

Total Income Collegiate Activities $4,046,346.18
## EXPENDITURES

**July 1, 1953 — June 30, 1954**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
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<tr>
<td>A-1 Salaries and Wages</td>
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<td>B-2 Travel</td>
<td>$26,854.32</td>
</tr>
<tr>
<td>B-3 Telephone &amp; Telegraph</td>
<td>12,411.32</td>
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<tr>
<td>B-4 Repairs</td>
<td>143,951.23</td>
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<td>B Contractual Services</td>
<td>123,856.08</td>
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<td>C Supplies</td>
<td>989,113.70</td>
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<td>D Other Charges</td>
<td>202,695.04</td>
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<td>G-7 Equipment</td>
<td>141,712.03</td>
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<td>H-2 Buildings</td>
<td>303,532.46</td>
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<td><strong>Total Expenditures</strong></td>
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## STUDENT ACTIVITY FUNDS

**Receipts:**

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<td>Athletic Association</td>
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<td>Taps</td>
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<tr>
<td>Tiger</td>
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<tr>
<td>Y. M. C. A.</td>
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<td>Concert Series</td>
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<td>Clemson Alumni News</td>
<td>.00</td>
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<tr>
<td>The Agrarian</td>
<td>1,097.91</td>
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<tr>
<td>Bobbin and Beaker</td>
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<tr>
<td>Slipstick</td>
<td>829.63</td>
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<tr>
<td>Student Organizations</td>
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<td><strong>Total Receipts</strong></td>
<td><strong>$398,681.58</strong></td>
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**Expenditures:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Salaries, Wages &amp; Professional Services</td>
<td>149,358.24</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>44,125.19</td>
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<tr>
<td>B-3 Telephone &amp; Telegraph</td>
<td>2,546.06</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>7,754.65</td>
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<tr>
<td>B Other Services</td>
<td>60,267.44</td>
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<tr>
<td>C Supplies</td>
<td>60,113.05</td>
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<tr>
<td>D Fixed Charges</td>
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<tr>
<td>G Equipment</td>
<td>5,448.44</td>
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<tr>
<td>H Transfers</td>
<td>1,326.37</td>
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<tr>
<td><strong>Total Expenditures</strong></td>
<td><strong>$412,017.38</strong></td>
</tr>
</tbody>
</table>
THE CLEMSON AGRICULTURAL COLLEGE

SPECIAL STATE APPROPRIATIONS

Appropriations:

Brought Forward:

- Filter Plant Enlargement: $95,000.00
- Purchase & Install Boiler: $154,000.00
- Remove, Enlarge & Build Steam Lines: $206,841.62
- Rebuild & Enlarge Electric System: $57,000.00
- Revamp Water & Sewer Lines: $39,381.00
- Remove & Equip Student Laundry: $268,687.86

Appropriation:

- Equipment for New Barracks: $298,000.00

Total Appropriation: $1,118,910.48

Expenditures:

- Equipment: $296,374.29
- Buildings: $206,884.60
- Improvements: $395,556.26

Total Expenditures: $898,815.15

Carried Forward: $220,095.33

SMITH-LEVER AGRICULTURAL EXTENSION WORK

Receipts:

Brought Forward: $3,256.25

Appropriations:

- Federal: $857,291.09
- State: $915,000.00

Total Appropriations: $1,775,547.34

Expenditures:

A Salaries and Wages: $1,440,545.29
B-2 Travel: $239,906.97
B-3 Telephone and Telegraph: $18,197.92
B-4 Repairs: $5,166.02
B Other Services: $21,739.44
C Supplies: $40,427.28
D Fixed Charges: $1,844.59
G Equipment: $7,069.83

Total Expenditures: $1,774,897.34

Carried Forward: $650.00

Total: $1,775,547.34
# MISCELLANEOUS STATE APPROPRIATIONS
## EXTENSION SERVICE

### Receipts:
- Brought Forward: $87,237.94
- Camp Long Appropriations: $2,400.00
- Camp Cooper Appropriations: $2,400.00
- State Marketing Commission: $9,750.00
- State Camp Improvement Fund: $101,787.94

### Expenditures:
- **A** Salaries and Wages: $14,225.21
- **B-2** Travel: $1,556.03
- **B-3** Telephone & Telegraph: $260.05
- **B-4** Repairs: $4.67
- **B** Other Services: $1,069.69
- **C** Supplies: $3,293.85
- **D** Fixed Charges: $59.50
- **G** Equipment: $3,869.43
- **H** Buildings: $43,781.91

**Total Expenditures:** $68,120.64

Carried Forward: $33,667.30

**Total:** $101,787.94

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# SOUTH CAROLINA EXPERIMENT STATION
## Federal Funds

### Receipts:
- Adams Fund: $15,000.00
- Hatch Fund: $15,000.00
- Purnell Fund: $60,000.00
- Bankhead-Jones Fund: $68,111.24
- Research & Marketing (Regional) Fund: $20,580.00
- Research & Mkt. (Non-Regional) Fund: $105,754.52
- P. M. A. Fund — Title 2: $2,640.00

**Total:** $287,085.76

### Expenditures:
- **A-1** Salaries: $259,360.66
- **B-2** Travel: $4,622.91
- **B-3** Telephone & Telegraph: $694.63
- **B-4** Repairs: $3,465.02
- **B** Other Services: $4,429.29
- **C** Supplies: $10,841.84
- **G** Equipment: $3,671.41

**Total:** $287,085.76
### SOUTH CAROLINA EXPERIMENT STATION

#### State Funds

**Receipts:**

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<tr>
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<td>Agricultural Research</td>
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<tr>
<td>Crop Pests &amp; Diseases</td>
<td>$58,224.00</td>
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<tr>
<td>Coast Station</td>
<td>$25,000.00</td>
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<td>Edisto Station</td>
<td>$129,750.00</td>
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<td>Pee Dee Station</td>
<td>$58,675.00</td>
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<td>Sandhill Station</td>
<td>$13,130.00</td>
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<td>Truck Station</td>
<td>$41,866.00</td>
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<td>Peach Research</td>
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<td>Research on Lice &amp; Pests on Tobacco</td>
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<td>Water Management</td>
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<td>Soil Testing Service</td>
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<td>Fertilizer Inspection &amp; Analysis</td>
<td>$76,699.00</td>
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<td>Fowl Disease Research</td>
<td>$19,000.00</td>
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<td>Blue Mold Cheese</td>
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<tr>
<td><strong>Total</strong></td>
<td>$683,699.00</td>
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**Expenditures:**

<table>
<thead>
<tr>
<th>Category</th>
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<tbody>
<tr>
<td>A Salaries and Wages</td>
<td>$503,623.41</td>
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<td>B-2 Travel</td>
<td>$18,025.69</td>
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<tr>
<td>B-3 Telephone &amp; Telegraph</td>
<td>$3,480.87</td>
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<td>B-4 Repairs</td>
<td>$17,510.53</td>
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<td>B Other Services</td>
<td>$12,969.82</td>
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<td>C Supplies</td>
<td>$79,167.15</td>
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<td>D Fixed Charges</td>
<td>$5,547.06</td>
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<td>G Equipment</td>
<td>$41,894.94</td>
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<td>H Improvements</td>
<td>$1,479.53</td>
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<td><strong>Total</strong></td>
<td>$683,699.00</td>
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### SOUTH CAROLINA EXPERIMENT STATION

#### Farm Products Fund

**Receipts:**

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<td>Balance Brought Forward</td>
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<tr>
<td>Farm Products</td>
<td>$519,964.15</td>
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<td>State Marketing — Reimbursement</td>
<td>$8,232.20</td>
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<td><strong>Total</strong></td>
<td>$580,143.99</td>
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Expenditures:

A Salaries & Wages ___________________ $ 166,451.48
B-2 Travel ------------------------------ 6,169.05
B-3 Telephone & Telegraph _____________ 2,268.67
B-4 Repairs ____________________________ 40,175.26
B Other Services _____________________ 25,684.77
C Supplies ---------------------------- 224,886.36
D Fixed Charges _____________________ 19,021.52
G Equipment ------------------------- 45,577.63
H-3 Improvements _____________________ 3,111.96
H-2 Buildings __________________________ 3,224.21
H Transfers --------------------------- 1,636.06

Total Expenditures: 538,207.02

Balance Carried Forward 41,936.97 $ 580,143.99

LIVESTOCK SANITARY WORK

Receipts:

State Appropriation ______________________ $ 207,429.00
Sales and Service ________________________ 31,166.21 $ 238,595.21

Expenditures:

A Salaries, Wages and Professional Services $ 134,181.01
B-2 Travel ____________________________ 26,099.43
B-3 Telephone & Telegraph _____________ 1,842.82
B-4 Repairs ___________________________ 2,086.52
B Other Services ______________________ 1,142.18
C Supplies __________________________ 36,503.77
D Fixed Charges ______________________ 26,245.24
G Equipment __________________________ 10,694.24 $ 238,595.21

Total Expenditures: $ 238,595.21

Special State Appropriation:

Construction — Laboratory Building $ 132,500.00
Completion — Laboratory Building 31,500.00 $ 164,000.00

Expenditures:

Building __________________________ $ 3,610.02
Carried Forward ______________________ 160,389.98 $ 164,000.00
Gentlemen:

The Board of Visitors wishes first to express our gratitude for the privilege of being chosen to serve in this capacity and deep appreciation for the many courtesies extended to us while at Clemson.

We were given every opportunity to observe and to have explained in as much detail, as limited time would permit, all the varied intricate operations and interests of this great institution.

We were deeply and favorably impressed with the growth, the efficient planning and management, and with the great and growing importance of Clemson to South Carolina.

We were warmly welcomed by President Poole and his administrative staff. During the brief visit to the President's office we were given a quick rundown on the breadth and scope of the operation of the school and all its departments and fully acquainted with the method of operation, sources of income, costs of various phases of operation, and something of the pressing needs for additional funds with which to pursue a progressive program of expansion according to needs predicated upon future growth and service requirements of the institution.

With its 2700 students, 1500 to 1700 employees on the payroll, and an operating budget of more than nine million dollars per year Clemson is big business. The new barracks buildings of latest design and modern construction now being erected constitute the latest evidence of the progressive spirit and wise planning and management. The new chemistry building and the new ceramics building are further evidence of this trend.

While we were making this inspection, ground was broken and construction work started on the new Plant and Animal Science
Building and the Food Processing Plant. Despite all the progress that has been made in recent years and the vast amount of improvement in new buildings and facilities, we were impressed by the fact that restricted availability of funds exists to the extent that many departments are cramped for space and facilities with which to fully develop and implement a well rounded and balanced program of instruction and activity.

The salary scale for the faculty is considerably below the average of competitive institutions. Perhaps the key to the magnificent contribution that Clemson has made to this state and nation in the past is most truly exemplified by the unselfish devotion and service of those who have continued to serve at personal financial sacrifice. We are well acquainted with the need for additional funds for physical facilities and for increased salaries. This need is present in most educational institutions and particularly in the state institutions of South Carolina. We are also now more than ever of the opinion that by reason of the breadth and scope of the work and activities of Clemson as a leading Land-Grant College that this need is more than usually acute.

In our opinion there is no more pressing need at Clemson than for adequate clinical and hospital facilities. Too much valuable equipment and supplies are housed in the present fire hazard so-called hospital. Modern housing of adequate proportion certainly is entitled to due consideration.

The School of Arts and Sciences, in which approximately one-third of all the teaching at Clemson is done, averaging more than two subjects per day for each of the 2700 students, has most inadequate facilities. The five departments of English, mathematics, languages, physics, and social sciences employ 63 full time teachers and there are only available sixteen offices for the 63 to 70 faculty members in these departments. The teaching staff is being rapidly upgraded from within but the salaries as well as the facilities are inadequate. The need for improved facilities in this department should receive attention simultaneously with that given to provision for an adequate hospital.

Obviously two days time was not sufficient for a detailed inspection or study. Although we visited all of the departments and con-
sulted with the heads of departments and with various staff members in most of the departments we were able to get no more than a brief resume of the work being done and the need for additional staff and facilities for doing the complete and efficient job which the public has come to expect Clemson to do.

The School of Engineering is already crowded for space and has much valuable equipment either still stored in crates or set up in temporary housing. There is a very great need for additional space of a permanent type.

Although originally named Clemson Agricultural and Mechanical College, the primary objective of the Land-Grant College Act was in the interest of agriculture. We are gratified that the agricultural phase of Clemson’s program and activity is being emphasized to a greater degree than in many years. The reorganization of this department and the new buildings being provided (including the new diagnostic and research laboratory at the Sand Hill Station) promise to effectively implement an accelerated program of research and education to more nearly meet the immediate needs of a changing and more complex agriculture.

We note with satisfaction the great improvement in the college library. Although not particularly well adapted for its purpose the building is being utilized advantageously to the extent that the valuable collection may be more adequately used by the faculty and students. Here again the staff and the funds for needed additional improvements and operation are inadequate.

Due to comparable need for additional funds for added improvements and operating costs in all state educational institutions, there is no good prospect for the needs of Clemson being supplied except gradually. Therefore there is need for procurement of greatly expanded foundation funds for supplementing regular funds for research. This is particularly true with respect to development of a means to supplement income of the teaching staff and as a means of additional income to competent and worthy students.

Regular college fees now total $752.60 per student per year, including tuition. Tuition for South Carolina students next year is to be increased from $80 to $100, and for out of state students from
$250 to $300. We are told that these small increases in fees for tuition are necessary in order to finance the current building program. While these costs are not out of line, there is some danger that increased costs may, in case of any recession of consequence, make it impossible for many students, particularly farm boys, to attend Clemson.

We are also told that student requests for loans are on the increase. Loan funds are limited. This further points up the pressing need for foundation funds and increased funds to be made available as a revolving fund for student loans. The present student loan fund came from private contributions and not from appropriated state funds. It is worthy of mention that the losses from this revolving fund through the years amount to less than 2%.

We were honored at a full scale military parade. The 1000 Army Cadets and 800 Air Force Cadets made it plain why Clemson is rated at the top among Land-Grant Military Colleges in this country. We were pleased at the information that Clemson students will continue to wear uniforms.

The spirit of the faculty and students of Clemson is inspirational. Although not a religious school the spirit of good-fellowship and the atmosphere of true Americanism and southern chivalry is evident at a glance. Student participation in religious services is most encouraging.

We have omitted specific mention of some departments and activities but such omissions should not be taken to mean that we do not fully appreciate the activities of these departments and special services. Through the outstanding School of Textiles, the School of Chemistry, the Fertilizer Inspection and Analysis Department, the Agricultural Education Department, the Extension Service, the Experiment Stations, and various other departments and activities we failed to mention specifically, Clemson is providing facilities and service of which all South Carolinians may well be proud.

We congratulate the Board of Trustees, those charged with the administration of the affairs of Clemson, and the General Assembly of South Carolina for the magnificent way in which they are
working together to provide a way by which Clemson may fulfill its destiny as a prime influence in the progress and advancement of industrial and agricultural development in a South Carolina of ever increasing importance among the states of this great country.

We recommend to you E. H. Agnew as the hold-over member of the Board for 1955.

Respectfully submitted,

The Reverend Ralph S. Meadowcroft
Hold-Over Member

Senator R. M. Jefferies
Senator Lawrence Hester
Ben Gramling
Doctor J. W. Neely

Charles N. Plowden
Francis S. Hanckel
E. H. Agnew
J. W. Gaston
B. D. McDonald
THE SOUTH CAROLINA EXPERIMENT STATION

O. B. Garrison, Director

The South Carolina Experiment Station of Clemson College includes the central unit at Clemson and the five substations located in the different agricultural regions of the state. The central station works on problems of statewide interest and those of particular interest to the Piedmont region. The five substations devote most of their research activities to the problems of their respective regions: the Pee Dee Station at Florence, the Edisto Station at Blackville, the Sandhill Station near Columbia, the Coast Station at Summerville, and the Truck Station near Charleston.

Below are brief reports of some of the important research projects and tests.

**Tax Studies for Legislature:** Farm tax studies provided the essential data for a recent report prepared by a special committee of the Legislature. The study included the assessment of farm real estate for tax purposes. Data obtained from seven selected counties were analyzed to show the relation of assessed value to sale price in nearly 1,200 sales during about two years. Using these data, the committee recommended the adoption of a statewide system of assessment and equalization to give relief to certain classes of land now generally overassessed.

**Improved Methods of Loading Melons Reduce Shipping Loss:** The station is cooperating with USDA, the railroads, and stations in Florida and Georgia, in an effort to cut down the heavy shipping losses each year, with emphasis on watermelons. Preliminary results indicate that a crosswise pack is far less subject to injury in transit than the conventional end-to-end pack. In fact, 12 pairs of cars shipped in 1953 show that melons packed crosswise had only 3 percent injury compared with 13 percent when packed end-to-end. Reduction in shipping losses should mean more melons at lower cost to consumers, more income to producers, and fewer damage claims against the railroads.
New crosswise method of packing watermelons. Less shipping damage results when melons are packed as shown here.

Soil Treatments Double Yield of Seed Cotton: Tests conducted at the Pee Dee Station 1950-1953 showed that soil treatments for nematodes increased the yield of seed cotton an average of 560 pounds per acre. Nematodes have become a serious problem in cotton production in the coastal area; and practically all crops are affected by one or more species of nematodes. Recent investigations show that injury can be considerably lessened by treating the soil with certain chemicals. Two of the more promising ones are Dow-fume and DD.

The Effect of Boron, Manganese on Cotton Yield: The addition of Colemanite and manganese sulfate has increased the average yield of seed cotton 145 pounds per acre and of lint cotton 54 pounds per acre on 17 survey demonstrations over the state. This result was due to increase in size of bolls and number of bolls and percentage of lint. On the station farms for several years, five pounds of Colemanite and five pounds of manganese sulfate, mixed with the amount of side-dressing the farmer used per acre, have shown response in better yields of cotton.
Increased Interest in Soil Testing: Over 18,000 soil samples sent in by farmers and others were tested in the soil-testing laboratory at Clemson during the past year. The demand for this free service has been steadily increasing and laboratory facilities have been expanded to handle the requests. More than 3,000 letters of recommendation stating the lime and fertilizer requirements for the soils under consideration were mailed to farmers submitting samples of soil for test purposes.

Two New Soybean Varieties Released: Two new nonshattering, disease-resistant soybean varieties, Lee and Jackson, have been developed and released through cooperation of the U. S. Regional Soybean Laboratory, the South Carolina Experiment Station, and two other southern experiment stations. The Lee variety has a very high degree of shatter resistance and is also resistant to bacterial pustule, wildfire, frogeye, and purple strain, and has high tolerance to rootknot nematode. The Jackson variety has desirable characteristics of a satisfactory oilseed bean, and makes favorable yields in all locations where tested. It matures 7 to 10 days later than Lee.

Using either or both of these varieties in a production program will permit a large acreage to be harvested by combines and thus should reduce production costs.
Irrigation Increases Crop Yields: Irrigation experiments during the past several years have shown that yields of corn, cotton, tobacco, sweet potatoes, tomatoes, and forage crops can be increased profitably by supplemental irrigation, which doubled the yields of corn, cotton, and sweet potatoes in 1953 at the Sandhill Station.

The tobacco in the right section of the accompanying photograph was treated for nematodes and irrigated; that in the left portion was irrigated but not treated for nematodes. Agronomists point out that land infested with nematodes should be treated if irrigated.

Increased Interest in Cotton Harvesters: Cotton farmers of the state are showing increased interest in the mechanical picker, as evidenced by the fact that in 1953 approximately 300 spindle pickers were in use in the state. Tests since 1945 to determine the best production practices adapted to mechanical harvesting have shown that for best picker operation the cotton should be planted to a thick uniform stand and that clean cultivation should be practiced the entire season. Studies of defoliation in relation to mechanical harvesting have also been made.

Comparative tests on various types of harvesters have shown that the spindle-type picker is best adapted to South Carolina conditions. Under favorable weather conditions, an average picker efficiency of 80 to 95 percent can be expected with this type machine.

Progress in Weed Control: Station experiments show that a great deal of progress is being made in weed control, and the use of pre-
emergence and post-emergence herbicides is helping to eliminate hoeing, one of the most expensive cotton operations. These herbicides promise to greatly reduce the cotton growers’ dependence on hand labor. No costly equipment is needed to apply these chemicals, as tractor outfits can be readily adapted for a chemical weed control program.

**Artificial Breeding Steadily Increases:** Recent figures released by the dairy bull stud at Clemson show that over 15,000 cows were bred in the state last year through the artificial breeding program. Since the program was started in 1945, a total of 70,000 cows have been artificially bred. The Clemson stud owns and manages 35 of the top bulls in the country and they are servicing 21 counties in which cooperative breeding associations have been organized.

**Urea in Dairy Rations:** Digestion and balance studies conducted with dairy heifers indicate that urea, a nonprotein nitrogenous material, when mixed with molasses can be a satisfactory replacement for 20.3 percent of the protein in the dairy ration. The urea was used to replace 1 pound of cottonseed meal, and the average gain per heifer was 1.44 pounds with a ration of 44 pounds of corn silage, 3 pounds of molasses containing 5 percent urea, and 1 pound of cottonseed meal. The control group gained 1.71 pounds daily per heifer on 45 pounds of corn silage, 3 pounds of molasses, and 2 pounds of cottonseed meal.

**Tobacco Wireworm Treatment Effective:** Entomologists at the Pee Dee Station report that outstanding control of tobacco wireworm can be obtained by adding a small amount of chlordane, heptachlor, or lindane to the water nominally used at the time of transplanting to the field. In the areas where the tobacco wireworm is abundant, it is one of the most destructive insect pests of young tobacco plants.

**Labor-saving Methods in Aromatic Tobacco Growing:** Station horticulturists and agricultural engineers have initiated projects to develop labor-saving methods in aromatic tobacco production, such as stringing the leaves in the field, using more efficient curing methods, and adopting mechanized equipment in transplanting and cultivating. Recently new devices have done much toward eliminating some of these time-consuming hand-labor chores.
New Pepper Released by Station: "Carolina Hot," a new cayenne pepper variety, has been released by the station for registration and trial competition for All-American selection honors, and will be available to pepper growers for 1955. It was developed through an extensive breeding program from desired plants already growing in the Florence area. Resistance to disease and nematodes was emphasized in the selection, along with plant types, pod shape, color, pungency, and high yields. This new variety is the first deciduous cayenne pepper ever developed, and during the past year an average yield of 2,400 pounds of dried pepper was produced, a yield well above that of any other pepper ever tried.
"Carolina Hot" new cayenne pepper variety developed by Experiment Station.

Sesame Research Progress: Successful commercial growing of sesame, one of the first oilseed crops ever grown by man, seems now much more likely. First introduced to America in South Carolina about the 17th Century, renewed interest in sesame is due to the need of a new oilseed crop to supplement cottonseed for southern cotton oil mills. The research has sought a new variety that will not shatter its seeds, will ripen uniformly, and can be harvested mechanically. The results obtained so far show promise in all these matters.

Economic Problems: A total of 565 pesticide samples was collected and analyzed in 1953, with only five samples found deficient. Apparently South Carolina is the only state that analyzes pesticides chemically and biologically to give the farmer double insurance against faulty materials. Since the new economic poison law was put into effect January 1, 1954, 135 companies have registered 1,864 products to June 30, with fees totaling $4,500.
Fertilizer Inspection and Analysis: Eight hundred fertilizer dealers, 160 fertilizer manufacturers, and numerous traveling salesmen sell and distribute to South Carolina farmers over one million tons of fertilizer and fertilizer materials annually, valued at 45 million dollars. This work is under supervision of the Fertilizer Board of Control, which is a committee of the Clemson College Board of Trustees. The department is a unit of the Experiment Station. District inspectors collect official fertilizer and insecticide samples for analysis and check on the tagging and labeling of all commercial material.

The chemical work consists of the analysis of these samples as provided by state laws. The department also analyzes waters, ores, minerals, and other naturally occurring materials, portions of human bodies in cases suspected of poisoning, and home-mixed fertilizers. All this is done without charge.
The fertilizer analysis work protects not only the farmers against the purchase and use of deficient fertilizer but also the fertilizer manufacturers. The number of fertilizer samples in 1954 totaled about 6,000, and only 4 percent was found deficient. The farmers collect 12 to 14 thousand dollars annually from the manufacturers on account of deficiencies and about 50 tons from shortages in weights.

Fertilizer dealer schools conducted by Clemson College have resulted in reducing the number of fertilizer grades from 222 in 1938 to 29 in 1953 and increasing the total plant food content for the same period from 16.03 to 21.20 percent.

**The State Crop Pest Commission:** The State Crop Pest Commission performs a number of important functions which benefit both industry and agriculture as well as individuals. It conducts regular and periodic inspections on any new infestations of pests which are not widely distributed. In addition, the commission performs or supervises the regulatory control operations to eradicate or prevent the spread of these pests. Another important function of the commission is the registration and analysis of the economic poisons in South Carolina, to insure that the purchaser receives satisfactory materials.

**Experimental Sheep Project:** Investigations to demonstrate the possibilities of sheep growing in South Carolina have been initiated as a result of a research grant made by Mr. Arthur O. Wellman, President of Nichols & Co., Inc., Boston, Mass. A modern well-equipped sheep experimental farm known as the Wellman Research Project has been established near Johnsonville, South Carolina, consisting of 134 acres of land leased to Clemson Agricultural College by the Wellman Combing Company. An additional 80-acre experimental sheep farm is being developed at Clemson College for investigation of problems pertaining to the sheep industry. This latter phase of the problem is receiving limited financial support from state and federal funds.

Importation of 104 registered pure-bred animals of the Polwarth breed has been made from Australia to determine their adaptability to South Carolina conditions for wool and lamb production.
Outstanding characteristics of this dual-purpose breed are: production of high-grade fine wool, adaptation to fat-lamb production, resistance to many diseases, and outstanding sturdiness.

Numerous problems relating to sheep growing in South Carolina are being considered in the research program. Some of the more important of these are: the adaptation of the Polwarth and other breeds and cross-breeds to South Carolina conditions, the factors retarding early lamb production, grazing management and supplemental feeding practices, the control of parasites, prevention of dog injuries, and development of marketing practices. The solution of some of these problems could result in a revival of a highly profitable sheep industry in South Carolina, based on the sale of fine wool and early fat lambs.
REPORT OF THE EXTENSION SERVICE  
D. W. Watkins, Director

The function of the Extension Service is to make available to farmers and their families through various suitable channels and methods the results of research and successful farm and home experience in agriculture and home economics and assist them in applying this information to improve their farms, farm homes, and communities, to the end that they may build a safe, sound, and progressive agriculture and rural life.

The annual program of work is planned and developed in close cooperation with the farm and home leadership of the state. A total of 8,191 farmers and farm women served on county, community, and state agricultural committees and gave liberally of their time and effort to the development and conduct of the extension program.

In carrying out the 1953 program, county extension agents visited 110,075 farms and homes to assist with problems; 131,826 farm people came to county extension offices; and 140,967 telephoned for information and assistance. Hundreds of training meetings, demonstrations, club meetings, and other group activities were conducted; and information was further provided by 14,413 newspaper articles, 278,592 farm and home bulletins, as well as radio and television programs. Nearly a million people were reached and helped by 33,773 educational meetings held or assisted by county extension workers.

Specific lines of extension activities included, as usual, economics and farm management, balanced farming, home management, agricultural engineering, crops and soils, fruits and vegetables, farm forestry, livestock, dairying, poultry, insects and diseases, home grounds improvement, food and nutrition, rural health, clothing, marketing, 4-H club work, and distribution of information through publications and newspapers and other media.

In balanced farming activities, 341 farm families were assisted in planning and carrying out better farm and home plans, and 56 of these families were presented awards of merit for outstanding accomplishment in good farming and good homemaking.
Extension home demonstration workers assisted 35,558 farm families with demonstration of recommended methods of canning and freezing their home food supplies. These families canned 2,273,489 containers of foods and froze 1,968,874 pounds of food.

In economics and farm management, extension workers held 844 community and county outlook meetings, attended by 22,128 farm people; 280 families kept demonstration farm records; 108 farmers conducted good landlord-tenant demonstrations; 71 farmers conducted Extension-TVA test programs; 86 farmers carried on father-son programs on their farms.

In home management, there were 296 demonstrations to 2,815 farm women on making home work easier, and many demonstrations on more efficient use of electricity, selecting home furnishings, refinishing and upholstering furniture, improving kitchens, remodeling homes.

In agricultural engineering, assistance was given 1,911 farmers with farm buildings; 40 tractor schools; 21 tractor 4-H clubs training 381 farm boys; 59 land-clearing equipment demonstrations; efficient use of electricity, irrigation, care and use of farm machinery, and various other engineering problems on the farm.
In work with field crops and pastures, soils and fertilizers, 829 five-acre cotton demonstrations were completed, with an average yield of 540 pounds of lint cotton per acre; a new low record of only seven-tenths of one percent of the 1953 cotton crop was rough-ginned; a new high record of 1,420 pounds of flue-cured tobacco per acre was made, the average yield having been doubled in the past 20 years through improved practices; the average production of 32 bushels of oats per acre was the highest on record; grassland farming continued to expand; a new high record of 1,549,000 acres of improved permanent pasture and annual grazing in 1953, a 12 percent increase over 1952.

The extension soil conservation program was conducted in cooperation with the soil conservation districts and the Soil Conservation Service. It included 166 demonstrations on establishing soil conservation practices, as well as many demonstrations on results of such practices, erosion control crops, farmer-built terraces, fertilizing and stocking and weed control of farm ponds.

County agents in cooperation with the soil conservation districts and the soil conservation service, assisted farmers throughout the state with problems of soil and water conservation.
Improved permanent pastures and annual grazing furnish the foundation for South Carolina's livestock industry. County agents report a new high estimate of 1,549,000 acres of improved permanent pasture and annual grazing in 1953.

Demonstrations with fruits and vegetables included home gardens, market gardening, home orchards, commercial fruit orchards, sweet potatoes, and general improvement of production and marketing of quality fruits and vegetables.

Farm forestry work is conducted cooperatively with the State Forestry Commission. It included demonstrations in selective cutting of farm timber, proper thinning of trees, tree planting, fence post treatment for longer life, woodland examinations and recommendations.

The extension livestock program includes work with farmers and 4-H clubsters in improving breeding, feeding, and management and marketing practices with beef cattle, hogs, and poultry. Sales of feeder and fat cattle totaled $871,653. Dairy cattle work assists farmers in producing high quality dairy products at lower costs through breeding, feeding, and management. The average produc-
tion of 3,770 pounds of milk per cow in 1953 was the third highest on record in the state.

In poultry work, assistance was given in the efficient production and marketing poultry and poultry products including turkeys. The production of 18,019,000 commercial broilers on South Carolina farms in 1953 set a new high record, production more than doubling since 1950. Seventy-nine poultry dressing plants and 45 turkey dressing plants have been developed to furnish outlets for the increasing production in the state.

Marketing milk on a milk route. Extension workers assisted 45,410 farmers in marketing surplus products of diversified farming to the value of $23,963,172.

Crop insects, diseases, and pests take an estimated toll of $75,-000,000 each year from South Carolina farmers, who spend yearly over $7,000,000 for control chemicals. An intensive program on control of cotton insects and diseases covered 80 percent of the state's cotton acreage; and 73,985 farmers were assisted with other insect and plant diseases. Beekeeping work included demonstrations on the value of bees for pollination, transferring to modern hives, requeening, and costs and returns in beekeeping.
Farm and home grounds improvement assistance was given to 18,296 farm families and to 213 community groups in community beautification. In home food production and conservation 38,508 farm families were assisted with production of vegetables for home food supply, including the canning of 2,273,489 containers of food and the freezing of 1,968,874 pounds of food. Nutrition demonstrations included providing better balanced diets for farm families by adding more vegetables, fruits, meats, milk, poultry, and eggs.

In 4-H club work, a new high record was set with 52,422 rural boys and girls enrolled in 1,766 clubs with training in all phases of farm and home activities, community activities, citizenship, leadership, etc.

Through thousands of timely news articles, feature stories, radio and television, and printed publications, the Extension Service kept the people informed on up-to-date agriculture, home economics, and other matters related to farming and rural life.

The 1953 average yield of 1420 pounds of flue-cured tobacco per acre on South Carolina farms is the highest on record for the state.
REPORT OF THE LIVESTOCK SANITARY DEPARTMENT

R. W. Carter, Director

The employees of the Livestock Sanitary Department have perhaps devoted more time to law enforcement problems during the past fiscal year than during any previous similar period. Efforts are made to apprehend all parties bringing in livestock and poultry in those cases where the health status of shipments fails to meet the standards as required by the state livestock rules and regulations.

In rendering service to the livestock industry, laboratory tests and examinations were made totaling 235,063 for brucellosis of cattle and other animals, pullorum and Arizona paracolon of turkeys, and miscellaneous tests and examinations.

**Vesicular Exanthema:** The outbreaks of this disease which occurred in February and lasted into the fall were brought under control and all animals were eliminated by slaughter. The actual outbreak of the disease, however, brought about the enactment of a workable garbage control law. There are now about 450 known garbage feeders who are satisfactorily cooking their garbage. The situation in the country as a whole is vastly improved, reflecting the advantages of the country-wide garbage cooking laws and regulations.

**Brucellosis:** Brucellosis presents one of the most difficult problems in this state and yet the interest is keenest. Strain 19 vaccine is extensively used throughout the United States, and sufficient information has been gathered to show its place in a control program. We have 378 herds classified as brucellosis-free accredited. Other complicating diseases causing premature births are vibriosis and leptospirosis, and several hundred blood samples were tested for each of these diseases.

**Tuberculosis:** The tuberculosis control work is being kept up to date. There are sufficient tuberculosis reactors showing marked lesions to indicate that this is not a solved problem. There were 55,536 herds of cattle tested for tuberculosis during the year, and we now have 238 herds on the accredited list.
Hog Cholera: The number of outbreaks of hog cholera on farms has diminished with the immunization of hogs against this disease in the auction markets. The new vaccines have passed the experimental stage but need an unbiased demonstration of their practicability. During the year this department treated 166,402 hogs against cholera.

Poultry Diseases: The diagnostic laboratory is equipped to render all types of diagnostic service to the poultry industry. As a sample of some of the types of work done during the year, 129,182 blood tests were made for such diseases as pullorum, Arizona paracolon, and salmonella typhimurium.

Auction Markets: There are 37 licensed auction markets in the state. The hog cholera vaccination program at the auction markets continues with satisfactory vaccination results and has greatly reduced the incidence of infection.

Breeders' Sales and Fairs: The department assists in checking the health status of animals at breeders' sales and issues interstate health certificates to out-of-state buyers. The health status of all animals and poultry at fairs is checked to give the exhibitor assurance that their exhibits will not be exposed to diseases.

New Office Building: Current facilities at the Sand Hill Station are adequate though crowded. The new building is anticipated with eagerness. The consolidation of the state and federal livestock sanitary agencies is progressing and will be complete when both agencies are in the same office, providing better diagnosis and service to the industry.

Educational Information: Educational information is conveyed to livestock and poultry owners through personal conferences, group meetings, bulletins, and news articles at frequent intervals.