SIXTY-THIRD ANNUAL REPORT

of the

BOARD OF TRUSTEES

of

THE CLEMSON AGRICULTURAL COLLEGE

to the

GENERAL ASSEMBLY OF SOUTH CAROLINA

1952

RECORD
The Clemson Agricultural College

Published quarterly by The Clemson Agricultural College, Clemson S. C. Entered as second class matter April 25, 1905, at the Post Office at Clemson, S. C., under the Act of July 16, 1894, now superseded by the Act of August 24, 1912.
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, 1951 to June 30, 1952.

The Clemson College Board is well pleased with the operation of the college as well as its several agencies.

Respectfully submitted,

R. M. Cooper
President, Board of Trustees

December 1, 1952
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I have the honor to present to you the sixty-third report of the President of Clemson College. In addition to the reports of the public service activities, I am including short statements regarding the activities of the various schools of the college.

The Registrar's Office records show that there were 2788 students enrolled in the first semester of 1951-52 and a total enrollment of 2926 for the year. Thus far this session we have enrolled 2764 students.

Graduates awarded degrees during the year were as follows: School of Agriculture 130, School of Arts and Sciences 31, School of Chemistry and Geology 6, School of Education 65, School of Engineering 155, School of Textiles 153.

Master of Science degrees were awarded as follows:

Dairy 1, Agricultural Economics 3, Education 6, Vocational Agricultural Education 1, Industrial Education 1, Physics 1, Chemistry 1. Total 14.

The enrollment of 2764 this semester includes 2685 undergraduate students who are majoring in the various schools as follows: Agriculture 559, Arts and Sciences 219, Chemistry 28, Education 233, Engineering 1,039*, Textiles 607. It is estimated that 75 graduate students will be enrolled during the year.

Of the present enrollment 79.8 percent of the students are from South Carolina, 14.9 percent are from other southern states, and 5.3 percent from other sections.

* Includes 117 students majoring in Agricultural Engineering which is jointly administered by School of Agriculture and School of Engineering.
WHERE THE CLEMSON STUDENTS COME FROM

FIRST SEMESTER 1952-1953

SOUTH CAROLINA 2204
NORTH CAR. & GEORGIA 288
OTHER SOU. STATES 125
OTHER STATES 147
TOTAL ENROLLMENT 2764

SOUTH CAROLINA 79.8%
OTHER SOU. STATES 14.9%
OTHER SECTIONS 5.3%
The School of Agriculture continues to build up its faculty and design its courses with three primary aims: To fit its students upon graduation for (1) practical farming, (2) positions as teachers, investigators, and extension workers, (3) service in various pursuits based upon or related to agriculture. The efficiency of the well trained staff in accomplishing these aims is very satisfactory.

For illustration, the Agricultural Engineering Department, now well established in its new building, is expanding its program of instruction to emphasize the value of engineering in modern agriculture. The Agronomy Department’s aim is first to train young men to return to the farm and to prepare others to lead in agricultural extension work or in industries related to agriculture. The Dairy Department seeks to give an understanding of the sciences on which rest the practices of dairy farming and the processing of dairy products. The Department of Horticulture trains its students in the scientific production and processing of fruits and vegetables. The other departments, similarly, strive to train students to know and apply the sciences related to their phases of agriculture.

Outstanding events and services during the year included: (1) Two Butterfat Testers’ Short Courses given under provisions of a state law; (2) A Dairy Products Conference in March, with 79 per-
sons attending; (3) A Milk Production Short Course, sponsored by the Mutual Security Agency, attended by 29 trainees from six European countries; (4) The success of Clemson's pioneer Junior Branch of the American Society for Horticultural Science, which is now serving as a pattern for a Southern Regional Junior Branch of this Society.

The problems of agriculture have much in common with the constant changes in nature. In such a complex situation it is necessary to constantly strive for perfection. We have seen how certain varieties of plants which are seemingly satisfactory give way to new varieties. The once promising varieties in various ways lose their good qualities. Much more research must be undertaken to keep abreast of agricultural problems. Fortunately the agricultural research under way in the Land Grant Colleges and Universities throughout the nation can be interpreted in terms of South Carolina usage and be relayed to our farmers by the Extension Service. Unfortunately we are not getting enough well trained men for research which is essential in controlling agricultural problems nor are we getting sufficient funds to employ good scientists for the work.

Discovering new facts and persuading people to apply them is the only way we can keep the wheels of progress moving successfully. It is felt that money appropriated for Agricultural Research and Teaching and for Agricultural Extension has been advantageously and meritoriously spent.

Pressing needs are for more space and equipment to facilitate the expanding activities of the School of Agriculture.

The School of Arts and Sciences now has a sufficient, stabilized, and well trained staff, resulting in smooth operation. Some new courses in certain departments have been offered successfully. Changes in quarters have made for better results in teaching and in administering the departments, though there is still the problem of inadequate facilities.

This school's principal function is to teach all students of the College mathematics, physics, English, foreign languages, and the social sciences. Training in these fields is needed by students as foundation for specializing in professional fields of their choice and as a broadening general education.
A special piece of extension work has been the preparation and issuing of a booklet addressed to high school students of South Carolina in an attempt to promote better high school training in English and mathematics.

Commendable activity in producing professional papers by the staff include a book by Dr. M. A. Owings on "The Arts in the Middle English Romances" and articles in professional journals by Dr. Lander, Dr. Miller, Dr. Lambeth, Mr. Johnson, Mr. Williams, and others—all evidences of fine scholarship. Likewise, participation in professional society programs has been noteworthy, and in the Physics Department research projects have been undertaken from time to time.

The School of Chemistry and Geology, which recently completed its first year of occupancy of its fine new building, has been able to do superior work and teaching. A $50,000 appropriation from the General Education Board and its matching funds have made possible completion of certain phases of the new plant for even greater efficiency, and the school is now in position to request ac-
creditation by the American Chemical Society and also able to provide graduate courses for the degree of M.S. in Chemistry. The Geology Department is looking towards the future establishment of a curriculum in geology and engineering geology.

Two chemical research projects have made considerable progress during the year, one by Dr. Dinwiddie on plant regulators and one by Dr. Schirmer on rapid spectroscopic methods for quantitative analysis of trace elements in the soil. These and other research projects which will be made possible by additional equipment will be of benefit to agricultural science.

The efficiency of the School of Education has been improved by the larger and better quarters now occupied in the Old Chemistry Building. The standards of its undergraduate work are being maintained, and its increasingly heavy graduate work is a challenge to the school's staff. Members of the staff have been active in pursuing further professional training and in attending educational conferences.

Besides the four older departments, the Department of Music Education is now functioning well and has had an excellent year under Mr. Robert E. Lovett, who is substituting for Mr. Hugh McGarity during a two-year leave.

The School of Engineering as a whole has made very satisfactory progress but needs, perhaps more than the other schools of the College, more buildings for room for expansion and effective work as enrollments increase.

Various improvements in several departments have added to the proficiency of the school. Among these may be mentioned: A model power plant put into operation by the Mechanical Engineering Department; establishment of the Summer Surveying Camp for all advanced civil engineering students; a refresher course in Land Surveying conducted by the Civil Engineering Department; progress made by the Engineering Experiment Station and the publication of a bulletin on Pressed Clay for Building Construction; the preparation of correspondence courses for use under the provisions of a Legislative Act for Teaching and Research in Water and Sewage.
Recognitions and distinctions won by the School of Engineering during the year include the following: First prize of $350 won by Walter H. Simmons for his rendering of a hospital for the Southern Region, sponsored by the U.S. Public Health Service Competition; the Lloyd Warren Scholarship Competition won by Ted Shirley, a 1947 graduate of Clemson, with Michael McMillan, a Clemson student, placing as one of the 12 finalists in the competition; the awarding to Clemson of the Edward Orton, Jr. Fellowship of $1200 for graduate study; positions obtained by all graduates of the Ceramics Engineering Department in South Carolina, and demand for other graduates.

During the year, the School of Engineering was host to the South-eastern Section of the American Society for Engineering Education; the regional meeting of the Association of Collegiate Schools of Engineering; the biennial Engineering-Architectural Fair, which drew 5,000 visitors.

The School of Textiles had an average of 638 students for the year, which is 22 percent of the enrollment of all the country's 10 textile schools. The graduates numbered 157, and the demand for them is several times more than we can supply.

Through donations from the Daniel Construction Company and several textile industry companies, the school has had a large equipment expansion. The largest single phase of this expansion was the setting up of a complete dyeing and finishing laboratory, other important items being a modern rayon throwing laboratory and woolen worsted equipment.

The high light of the year was the Sirrine Hall Dedication Day November 3, 1951. This and several other textile meetings at Clemson have brought highest praise for the Textile School and inspiration for our textile students and faculty.

In textile research, the school now has three contract projects with the U. S. Department of Agriculture totaling $50,000, two with the Dow Chemical Company, and one with Sonoco Products Company; and several research projects under the Sirrine Fund.

In general, it can be said that the efficiency of the school is at its highest level. Ample equipment and a highly trained staff pro-
vide students with unsurpassed opportunity for training in every phase of textile processing.

The Graduate School in its second year after organization as such, has made satisfactory progress. The enrollment, about the same as for last year, would have been larger but for the fact that graduates who might otherwise take graduate work have been called into the Armed Forces and into industry.

Seventeen students have received advanced degrees within the year: five in chemistry, four in economics, two in textile chemistry, and one each in dairying, agricultural education, and physics.

Considerable progress has been made in establishing research programs for the faculty groups, notably in physics, chemistry, textile chemistry, and entomology and zoology. This will strengthen the general graduate program.

There is urgent need for office and laboratory space to make the work of the graduate students and teachers more efficient.

The Military Department has had a particularly good year. The Corps of Cadets again made an outstanding showing in the annual inspection of the R.O.T.C. unit; and the department's continuing policy of building up an esprit de corps and cementing the harmonious relationship with the college authorities has had excellent results.

The Military Department and the Corps of Cadets have taken part in numerous significant events during the year. These include the review by Major General William A. Beiderlinden, Deputy Commanding General of the Third Army, who expressed high regard for the appearance and training of the Corps; the Home-Coming Day exercises; the Armistice Memorial Day; the two-day visit of Governor Byrnes and the Legislature; and the military funerals of soldiers killed in Korean action.

This department continues to forward its objectives: to maintain and operate the R.O.T.C. units of the several Army branches and the Air Force, and to present the R.O.T.C. program of instruction effectively; to assist the President of the College in the ad-
ministration and discipline of the student body. Clemson students are under continuous military supervision.

At midterm and June graduation exercises, 177 second lieutenants were commissioned in the Army Officers' Reserve Corps and 55 in the Air Force ORC. Forty-four accepted Regular Army commissions and one accepted a Regular Air Force commission.

R. F. Poole, President.
REPORT OF THE TREASURER
A. J. Brown, Secretary-Treasurer

THE CLEMSON AGRICULTURAL COLLEGE OF SOUTH CAROLINA
COLLEGIATE ACTIVITIES

Fiscal Year July 1, 1951 to June 30, 1952

INCOME

Legislative Appropriation:
(Revenue from Operation of Clemson College Transmitted to State of South Carolina)

Tuition & Matriculation Fees
Session 1951-52 $ 339,319.76

Privilege Fertilizer Tag Tax paid to
State of South Carolina 256,740.72

From Other State Funds 933,939.52

Total Legislative Appropriation $1,530,000.00

Federal Funds 45,557.34
Endowment Funds 9,266.36
Miscellaneous — Rents, Sales & Service 101,693.62

Student Fees:
Laboratory Fees $ 127,327.64
Class Maintenance Fees 44,797.66
Summer School 1951 26,325.06
Summer School 1952 46,108.12 244,558.48

Sales and Service Collegiate Departments 430,423.01
Auxiliary Enterprises 1,056,798.59
Total Income Collegiate Activities $3,418,297.40
## EXPENDITURES

*THE CLEMSON AGRICULTURAL COLLEGE*

**July 1, 1951 — June 30, 1952**

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<tr>
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<td>B-2 Travel</td>
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<tr>
<td>B-3 Telephone &amp; Telegraph</td>
<td>10,060.31</td>
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<tr>
<td>B-4 Repairs</td>
<td>153,554.25</td>
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<td>B-6 Heat, Light, Water, Coal &amp; Power</td>
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<td>B Contractual Services</td>
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<td>C Supplies</td>
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<td>D Other Charges</td>
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<td>G-7 Equipment</td>
<td>89,406.09</td>
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<td>H-3 Improvements</td>
<td>1,425.17</td>
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<td>H-2 Buildings</td>
<td>7,709.22</td>
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<tr>
<td>H-4 Transfers</td>
<td>39,000.00</td>
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**Total Expenditures** $3,411,573.09

*Includes $70,903.18 for Fertilizer Inspection and Analysis and $1,056,798.59 for Student Subsistence, Room, Laundry, etc.*

## STUDENT ACTIVITY FUNDS

### Receipts:

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<td>Taps</td>
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<tr>
<td>Tiger</td>
<td>13,113.11</td>
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<td>YMCA</td>
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<tr>
<td>Concert Series</td>
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<td>Clemson Alumni News</td>
<td>4,526.52</td>
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**Total Receipts** $452,878.14

### Expenditures:

<table>
<thead>
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<th>Amount</th>
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<td>A-1 Salaries</td>
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<td>A-2 Professional Services &amp; Wages</td>
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<td>B-2 Travel</td>
<td>67,839.56</td>
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<tr>
<td>B-3 Telephone &amp; Telegraph</td>
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<td>B-4 Repairs</td>
<td>10,211.69</td>
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<td>B Other Services</td>
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<td>C Supplies</td>
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<td>D Fixed Charges</td>
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<tr>
<td>Transfers</td>
<td>50.00</td>
</tr>
<tr>
<td>Investments</td>
<td>2,200.00</td>
</tr>
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</table>

**Total Expenditures** $458,912.99
SPECIAL STATE APPROPRIATIONS

Appropriations:
Clemson College — For the construction of buildings or the renovation or repair of existing buildings, and equipment therefor
- Chemistry Building $36,755.24
- Utilities of Buildings $18,827.74 $55,582.98

Expenditures:
- A-2 Wages $1,740.51
- B-4 Repairs $14,855.31
- C Supplies $546.93
- G Equipment $1,732.40
- H-2 Buildings $36,707.83 $55,582.98

SMITH-LEVER AGRICULTURAL EXTENSION WORK

Receipts:
- Brought Forward $4,694.48
- Appropriations: Federal $855,254.34
- State $652,000.00
- $1,511,948.82

Expenditures:
- A-1 Salaries $1,173,281.48
- A-2 Wages $7,504.43
- B-2 Travel $223,259.98
- B-3 Telephone & Telegraph $16,238.93
- B-4 Repairs $6,416.31
- B-5 Heat, Light, Water & Power $1,327.32
- B Other Services $28,617.64
- C Supplies $41,052.31
- D Fixed Charges $232.00
- G Equipment $10,200.42
- $1,508,130.82
- Carried Forward $3,818.00 $1,511,948.82
### MISCELLANEOUS STATE APPROPRIATIONS

#### EXTENSION SERVICE

**Receipts:**
- Camp Long Appropriation: $2,400.00
- Camp Cooper Appropriation: $2,400.00
- State Marketing Commission: $6,964.00
  
**Total Receipts:** $11,764.00

**Expenditures:**
- A-1 Salaries: $5,448.47
- A-2 Wages: $3,300.00
- B-2 Travel: $1,098.04
- B-3 Telephone & Telegraph: $42.53
- B-6 Heat, Light, Water & Power: $203.80
- B Other Services: $16.50
- C Supplies: $488.72
- D Fixed Charges: $16.50
- G Equipment: $427.24
  
**Total Expenditures:** $11,764.00

#### 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: $29,829.00
- Research & Marketing (Non-Regional) Fund: $88,339.12
  
**Total Receipts:** $276,279.36

**Expenditures:**
- A-1 Salaries: $232,757.88
- B-2 Travel: $3,925.35
- B-3 Telephone & Telegraph: $871.45
- B-4 Repairs: $4,999.19
- B-6 Heat, Light, Water & Power: $1,816.92
- B Other Services: $8,566.49
- C Supplies: $19,592.25
- D Fixed Charges: $240.20
- G Equipment: $11,238.71
- H-3 Improvements: $1,259.12
- Buildings: $723.32
  
**Total Expenditures:** $285,890.88
SOUTH CAROLINA EXPERIMENT STATION
State Funds

Receipts:
- Agricultural Research $148,683.00
- Crop Pests & Diseases $36,300.00
- Coast Station $10,450.00
- Edisto Station $108,800.00
- Pee Dee Station $51,700.00
- Sandhill Station $10,400.00
- Truck Station $35,750.00
- Peach Research $13,200.00
- Research on Lice & Pests on Tobacco $20,900.00
- Water Management $10,000.00
- Soil Testing Service $15,000.00
- Control of White Fringed Beetles $5,000.00

Total Receipts: $466,183.00

Expenditures:
- A-1 Salaries $249,541.08
- A-2 Wages $91,132.38
- B-2 Travel $9,404.16
- B-3 Telephone & Telegraph $2,144.09
- B-4 Repairs $11,071.76
- B-6 Heat, Light, Water & Power $1,739.11
- B Other Services $6,967.86
- C Supplies $64,356.48
- D Fixed Charges $6,284.15
- G Equipment $23,009.99
- H Improvements $5,531.94

Total Expenditures: $471,183.00*

* Crop Pests and Diseases Work was allowed to over expend 1951-52 appropriation by $5,000.00 in order to carry on emergency control work on white fringed beetles. Overdraft will be covered by 1952-53 appropriation.

SOUTH CAROLINA EXPERIMENT STATION
Farm Products Fund

Receipts:
- Balance Brought Forward $46,419.12
- Farm Products $598,001.60
- State Marketing — Reimbursement $5,606.13
- Market Information — Reimbursement $18,905.67
- S. C. Foundation Seed Work $0.00

Total Receipts: $668,932.52
**Expenditures:**

<table>
<thead>
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<th>Amount</th>
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<tr>
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<td>B-4 Repairs</td>
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<td>D Fixed Charges</td>
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<td>G Equipment</td>
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<td>H-2 Buildings</td>
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<td><strong>Balance Carried Forward</strong></td>
<td><strong>64,824.26</strong></td>
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<tr>
<td><strong>Total</strong></td>
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**Receipts:**

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<tr>
<td><strong>Total</strong></td>
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**LIVESTOCK SANITARY WORK**

**Expenditures:**

<table>
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<tbody>
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<tr>
<td><strong>Total</strong></td>
<td><strong>189,838.60</strong></td>
</tr>
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</table>

**Balance Carried Forward**

**64,824.26**
We wish to thank you, and the President, for your appointment of us as a Board of Visitors to inspect the institution. We spent three busy days, May 7th, 8th and 9th, on well planned tours, and have seen and learned a great deal. South Carolina may well be proud of its great institution. It should be thankful for the vision of its founder and the devotion and skill of those who have directed its development over the years, often under great handicaps due to inadequate funds provided for its support. We believe that you, through the able administration of Dr. Poole and his excellent staff, are making the wisest and fullest use of what you have. If this institution is to maintain its present high standards and be of continued service to our great State, additional aid will have to be obtained from our General Assembly. We trust that they will find it possible to provide the funds for at least the minimum necessities which we recommend and which follow.

We do not believe that any institution is better than its faculty. We were deeply impressed with the high caliber of leadership at Clemson. To have been able to build it under the inflationary spiral that has existed in the last decade has required great skill on the part of Dr. Poole and a missionary spirit on the part of the members of the faculty. In order to maintain it, we believe additional financial aid must be given so as to bring the salaries more in line with those of similar institutions in this general area, and more in line with the upward trend of salaries in industry.

In order to make efficient use of an excellent faculty, it needs reasonable facilities in which to instruct. With the increase of boys of our State wanting and being eligible for a college education, and the subsequent growth of the student body and the expected continued growth, some of the facilities have become in-
adequate through lack of space and others through age. Accordingly, we recommend in the order of their importance, the following:

Those studies such as English, mathematics, physics, etc., which are basic to all specialized courses and which form the necessary foundation to any degree, are under the head of one department. The classrooms where these various subjects are taught are located in several buildings on the campus, all of which were built for other purposes. We believe that it is highly important that the work of this department be located in one building. We recognize that this would mean the erection of a new building but as this department is so important and necessary to the advancement of every student at the college, we recommend the erection of a new building for this department.

Second, the engineering building is overcrowded and consequently inadequate. To be able to utilize and to protect its fine equipment and to provide reasonable quarters for instruction, the temporary building needs to be made permanent. We recommend that serious consideration be given to a new building in accordance with the plans and drawings now in the possession of the Dean of Engineering and the President of the College.

The rapid and healthy industrialization of South Carolina, brought about in no small part by the stability and foresight of our Governor and State Government, and the consequent increase of our population and the movement of farm labor to manufacturing plants, has added additional problems to our farmers. Many have, of necessity, turned to various types of livestock and to increased interest in this field of farming. To maintain the high level of teaching and of service to the increasing students and farmers in this field, we recommend the addition of an animal science building, which will make possible added research in this field.

It is our considered opinion that the hospital building is too small and not of the proper construction, considering the present and probable increases in the enrollment. Should an epidemic occur, it would be very difficult to adequately handle the sick in the present building. Furthermore, to not only protect those who are interned in the hospital, but to also protect the fine equipment which the frame building houses, we believe that a larger one, of fire-
proof material, is badly needed, and we respectfully recommend that the same be provided.

The Board was greatly impressed with the work being done in the Fertilizer Inspection Department. We feel that this department could be made even more efficient by added space, which could be accomplished by an addition to the present building. We recommend that consideration be given to this addition.

We inspected the plant and equipment that supplies water, not only to the college, but to the surrounding residential and business areas. We learned that the present consumption approaches the maximum supply that the plant can furnish. We feel that the potential should be substantially greater than the normal usage, therefore, some consideration should be given to an additional unit.

The need of an armory for the military has been stressed in previous reports, and our investigation substantiates the necessity of this addition to the military effort.

There are many other needed physical facilities but we recognize that our General Assembly is faced with many problems in all phases of our life, therefore, we are urging serious consideration of only those needs which, when taken together with other great needs of our State, appear paramount.

The Board was impressed with the presentations as made by the deans of the various schools, and we were appreciative of their patience in answering our every question.

We particularly commend the Dean of the School of Arts and Sciences and his staff for their splendid work and for the addition of equipment in the Physics Department.

We would like to commend the School of Engineering, particularly for the fine work being done in its department of ceramics, which is so helpful to the industrial growth of our State. We realize certain handicaps under which this school is operating, and it is felt that by certain re-arrangements and changing of lighting and some painting, the present facilities could be made more efficient.

The Board was tremendously impressed with the new chemistry building, and commends the Dean and his staff for the intelligent and progressive arrangement of it.
The Board feels that all South Carolina should be proud of its School of Textiles and the outstanding work being carried on by the Dean and his staff. We are appreciative of the Legislature for providing for the building, and the generosity and interest of the textile industry, particularly the Sirrine Foundation in generously adding to the equipment. The Board would like to recommend that a library, restricted to textile publications, be provided in the textile building for the benefit of the students.

The Board was impressed with the splendid work being done in the School of Agriculture, the Experiment Station, and the Extension Service. Particular commendation is due the dairy, animal husbandry, poultry production, and food preservation departments, to the splendid group of experts who are carrying the results of teaching and research to the farmers of our State. This great service is valuable because many of our farmers are having to improve their methods or to change from cotton farming to various types of livestock.

We wish to congratulate Dr. Poole and the Commandant for their fine work in improving the morale and high standing of the Corps through their military training. The Board witnessed a very excellent dress parade and feels that Clemson should be proud of its band and its volunteer drill platoon.

We enjoyed a very excellent meal in the diningroom; and it was our conclusion that this department of the college was run with extreme efficiency and economy.

The Board recognizes the many problems which the Board of Trustees faces and has wisely heretofore faced, considering the limitations of financial aid which has been available. We feel that as far as is feasible a master policy may need to be set up which will determine the extent to which additional appropriations will be used to provide for a larger enrollment or a more efficient and thorough operation with its present enrollment. It recognizes too that in considering the addition and emphasis of the various departments, a proper balance between diversified industry and agriculture will need to be maintained. It respectfully emphasizes this, recognizing that the Board, through the administration of the institution, has been of great interest and importance to incoming industry.
We recommend that the toxicological work of Clemson be transferred to the Medical College of South Carolina.

It was with regret that we learned of the large number of high school graduates who are not prepared to take the freshman class work and who either fail or take remedial work. This is wasteful, both to the parents who have to pay for longer attendance, and to the college, which has to pay for additional instructors. It compels the college to engage in work which should be done in the high schools. We understand that similar conditions exist at the other colleges of South Carolina, both state and denominational. The colleges have a right to look to the State Board of Education to correct the wasteful condition by prescribing a course of study in the high schools designed to fit their graduates for college entrance. (The State Board of Education is empowered, under Section 5282, Code 1952, "to prescribe and enforce the course of study for the free public schools.") We suggest that the college presidents of South Carolina, and representatives of the State Teachers' Association meet with the State Board of Education in an effort to have this deplorable condition corrected. Clemson College might well initiate such a conference.

We feel that the General Assembly might wisely appropriate a fund sufficient for the college to employ and support a staff of experts whose entire time would be devoted to original research work calculated to develop and utilize the many material resources of South Carolina. The inventions and processes evolved therefrom would not only add to the wealth of the State but through patents obtained, could be a source of considerable revenue to the college. The college, through agricultural and allied research has already accomplished much. We believe that a great deal would be gained by broadening the field of research to include other material resources of our state.

In closing our report, we wish to thank Dr. Poole and those responsible under him for making our trip not only informing, but enjoyable. We wish, too, to thank Messrs. J. H. Woodward and Walter Cox for the pleasure of our association with them and for their courtesy and patience in guiding us through our tours. Also we wish to thank the heads of the various departments who so thoroughly cooperated in disclosing to us the work being carried
on under their guidance and in answering our questions as to the needs of their departments and the work the college is doing. They all impressed us as being men of vision, experts well qualified in their particular fields, loyal and devoted to the college, and to their work.

Respectfully submitted,

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REPORT OF DEPARTMENT OF FERTILIZER INSPECTION AND ANALYSIS

H. P. Cooper, Director

The Department of Fertilizer Inspection and Analysis collects official fertilizer samples for analysis and checks weights and other matters for compliance with the law. The fertilizer industry is a large one, and the work of this department is increasing. About 42 million dollars worth of fertilizer and material is used in South Carolina annually. Ninety-eight fertilizer manufacturing plants are located in South Carolina, and 72 plants in 15 other states do business in this state.

The Department makes analyses of insecticides, unexploited sources of water, minerals, and parts of human bodies in cases of suspected poisoning. Since a large percentage of the fertilizer dealers are also insecticide dealers, the fertilizer inspectors collect both the fertilizer and the insecticide samples at the same time.

Below is a brief tabulation of the activities of the department.

Tons of fertilizer for which tags were furnished _____ 1,002,068
Number of samples procured ______________________ 5,505
Number of bags underweight in dealers' warehouses 7,207
Average shortage per bag, lbs. ____________________ 2.7
Number of bags with other irregularities
in dealers' warehouses ___________________________ 10,380
Number of bags underweight on farms ____________ 7,027
Pounds of fertilizer refunded to farmers
because of short weight ___________________________ 82,846
Number of toxicological examinations ______________ 6
Number of samples of water analyzed ______________ 24
Number of official insecticide samples collected ___ 225

On May 21 and 22, 1952, the meeting of the fertilizer manufacturers, dealers, and salesmen was held at Clemson College, the first day being devoted largely to touring the Experiment Station and College farms, the second day to discussions of topics of current interest by guest speakers and members of the staff.
REPORT OF THE LIVESTOCK SANITARY DEPARTMENT

R. A. Mays, Director

In making investigations and treating livestock and poultry against contagious and infectious diseases, 17,250 individual farms and premises were visited. The diseases included hog cholera, blackleg, hemorrhagic septicemia, keratitis, brucellosis, brucella vaccination, encephalomyelitis, rabies, fowl pox, etc., involving a total of 282,726 animals and birds.

Laboratory tests and examinations were made totaling 248,405 for brucellosis of cattle and other animals, pullorum and Arizona paracolon of turkeys, and miscellaneous tests and examinations.

Auction Markets: There are 36 auction markets under supervision holding one sale each week. The department furnishes a veterinarian at each weekly sale to treat hogs against cholera, test breeding and dairy cattle for brucellosis, and treat cattle against miscellaneous diseases.

Livestock Inspectors: Two livestock inspectors devote their time to checking on possible violations of laws and regulations regarding importation of livestock and also the health status of animals passing through the auction markets. They find constant improvement in all regulatory disease control work.

Brucellosis: In testing 124,626 cattle blood samples for brucellosis, 1.77 percent infection was found. There is a tendency throughout the United States to stress the calfhood vaccination program as a means of building up resistance to brucellosis infection, to curb losses in case the disease should gain entrance into a herd. Official records show that 5,488 calves were injected with brucellosis vaccine.

On June 30, 1952, 381 herds of cattle were classified as Accredited Brucellosis-Free; and during the year Marlboro County, with less than 1 percent infection, was classed as Modified Accredited Brucellosis Disease-Free for two years.
Selling cattle through the auction market.

**Tuberculosis:** The entire state is classified as a Tuberculosis Modified Accredited Free Area. On June 30, 1952, 187 herds were classified as Tuberculosis Accredited. During the year 47,353 cattle were tested for tuberculosis and 18 animals were found infected and were slaughtered as required.

**Fairs and Breeders’ Sales:** The demands for assistance in checking animals for fairs and sales is naturally increasing in proportion to our livestock industry. It is important to know that live-
stock congregated for a show, fair, or sale are free from contagious and infectious diseases.

**Hog Cholera:** Hog cholera in the state has been reduced, though in some heavily infested areas the losses from this disease were rather high. Some of the losses may be explained by the failure of some swine owners to systematically treat all young pigs against cholera. It has been noted also that some of the new products have failed to protect hogs against cholera. It appears that the old reliable hog cholera virus and anti-hog cholera serum, administered to young pigs 30 to 60 days after weaning, gives the best type of resistance against the disease.

**Poultry:** The laboratory diagnosis service has been in demand during the year by turkey and chicken growers as a means of preventing and eliminating outbreaks of contagious and infectious diseases among their birds. In handling this work, 2685 specimens were examined.

**Educational Publications:** In order to keep the livestock industry up-to-date regarding animal diseases, their prevention and control, we have distributed bulletins, newspaper articles, and short periodicals to thousands of livestock owners.
SUPPLEMENTARY REPORTS

REPORT OF THE STATE CROP PEST COMMISSION

H. P. Cooper, Director

The Crop Pest Commission conducts regular and periodic inspections concerning destructive pests of crops, keeps a sharp lookout for new infestations, and handles the collection and analysis of insecticides.

Inspections: Fifty-four greenhouses covering approximately 670,000 square feet were inspected and certified.

Three inspections, including field, storage, and plantbed, totaling 225 inspections, were made for 75 sweet potato growers.

Approximately 52,000 one-hundred-pound bags of seed stock Irish potatoes were inspected in Charleston County.

During the 1951 season 1,413,859 peach trees on 653 properties were inspected for phony peach disease.

A total of 1,028 inspections for sweet potato weevil showed no infestation outside the restricted area in Charleston County.

Forty-nine apiaries containing 4,991 colonies of bees were inspected.

Infestations: A new and rather heavy infestation of the white-fringed beetle, involving 875 acres of farm land and railroad and highway rights-of-way was discovered in Darlington and Florence Counties. A small infestation involving approximately 15 acres was discovered at Myrtle Beach. All of this area has been treated and approximately 350 acres bordering.

The white-fringed beetle, a destructive pest of farm crops, was found in two small nurseries during the inspection of 259 nurseries.

Trapping surveys for the Japanese beetle revealed no infestations established except on the North Carolina line on U. S. Highway 25.

A light infestation of the imported fire ant was found in Charleston County.
The golden nematode has not been found in inspections of Irish potatoes in South Carolina.

**Insecticides:** A total of 86 companies marketing economic poisons in South Carolina registered 1,190 pesticides during the year. Seventeen insecticide-fertilizer mixtures were registered during the same period.

Samples of insecticides collected and analyzed during the year numbered 516. Of these less than 1 percent was found to be deficient or mislabeled.
The South Carolina Agricultural Experiment Station organization 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 on the problems 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 on some of the important research projects and tests.

**Injuries in Harvesting Potatoes:** Recent studies by the Department of Agricultural Economics of this Station in cooperation with other southeastern experiment stations indicate that a considerable reduction in physical injuries to early Irish potatoes can be effected through improved harvesting practices. Two years' study on the use of several containers in harvesting operations showed a marked difference in the quantity of potatoes injured. The amount of injured potatoes per 100 pounds handled in wire baskets was 12 pounds, in wooden hampers 6 pounds, in rubber-coated wire baskets 3 pounds.

Studies with potato diggers indicate that through the use of web belting over the link ends of the chain and rubber tubing on every raised link, injuries can be reduced from 9 pounds per hundred to about 1 pound with the Sebago variety; from about 32 pounds per hundred to 7.5 pounds with the Pontiac variety.

Tests on speed of digging showed that the percentage of injury was about four times as great at 3.5 miles per hour as at 1.5 miles per hour in harvesting Sebagos; and twice as great in harvesting Pontiacs.
**Hog Marketing Practices:** During 1951 the principal hog markets in the state consisted of 36 auction markets, 7 cooperatives, and 15 packing plants. Sixteen percent of the hogs were sold to packers and 10 percent were sold through cooperatives. Top prices on the markets were for hogs weighing 180 to 260 pounds.

**Improvement of Marketing Facilities:** The passage of an act by the South Carolina legislature which created the State Agricultural Marketing Commission has led to an improvement and expansion of marketing facilities and marketing information. The Department of Agricultural Economics has been cooperating with this Commission in making studies to determine the adequacy of present marketing facilities. Eight specific studies have been made and reported to the Commission. Cooperating with the Commission and the State Crop Reporting Service, the Department of Agricultural Economics has issued six publications containing compilations of the more important agricultural data of South Carolina.

*Figure 1.—Windrow pick-up attachment used in harvesting fescue seed.*
Improved Seed Harvesting Practices: For two years studies of the problems in harvesting and cleaning grass and small legume seeds have been conducted in cooperation with the U. S. Department of Agriculture’s Bureau of Plant Industry, Soils and Agricultural Engineering. Preliminary tests were made in 1951 to determine the major sources of seed losses in harvesting and cleaning crimson clover, fescue, and the lespedezas. The most common causes of losses of seed for these crops are as follows: crimson clover, incomplete threshing; fescue, shattering and light seed blown over in the chaff; common lespedeza, cutter-bar shattering.

Irrigation Studies: Irrigation tests indicate that important savings of water may be made in irrigating certain crops. The increased corn yields in bushels per acre per inch of irrigation water under different practices were as follows: Irrigated after tasseling,
35.0 bushels; when severely wilted, 20 bushels; at frequent intervals for maximum yields, 13.5 bushels. Similar results have been obtained on forage and pasture crops.

**Dug Ponds for Irrigation Water:** Draw-down and recovery tests on dug ponds in the Coastal Plains and near the college indicate that these shallow wells, when properly located, are very economical and dependable sources of irrigation water.

**Cotton Mechanization:** Progress in cotton mechanization during the past 10 years has been little short of phenomenal. Because of the farm labor shortage, tractor power and machinery are being used to an unprecedented extent. The most significant of the new machines in cotton production is the mechanical cotton picker.

![Figure 3.—Three spindle-type harvesters tested. From left to right, the International Harvester M-14, the IHC experimental C-14, and the Allis-Chalmers 2-row.](image)
Although only a small percentage of the cotton produced in South Carolina is machine-harvested, farmers are showing increased interest in the future of these machines. The full potential of the cotton picker as a labor-saving device is only beginning to be realized.

During the past four years, tests have been conducted to determine the production practices best adapted to spindle picking, with particular attention to pickers more adaptable to conditions in the Southeast.

**Chemicals Useful in Controlling Weeds in Cotton:** The relatively high cost of farm labor has created considerable interest in the use of chemical herbicides in the control of grasses and weeds during the early stage of plant growth. Twenty materials or combinations of materials were tested at the Pee Dee Station. Only two, Chloro-IPC and CMU, gave satisfactory control of grasses without injury to the cotton plants. Seasonal conditions and soil type have a bearing on the effectiveness of control and the extent of injury to the crop, and further tests are planned to study these factors.

**Soil-Treating Service:** Recently suitable laboratory equipment has been selected to set up a modern, well-equipped soil-testing and research laboratory. For many years a soil-testing service offered free to farmers and others has been conducted in the agronomy research laboratories. More than 12,000 soil samples were tested in this laboratory the past fiscal year, and lime and fertilizer recommendations sent to farmers along with their soil-test reports.

**Advantages of Low-Solubility Boron Compounds:** During the past two years experiments have been conducted with several boron compounds varying in solubility in water. Colemanite, one of the less soluble compounds, appears very promising. The more soluble borates supply a larger quantity of boron to the cotton plant in the seedling stage, producing a toxic effect which greatly reduces the stand. Work is now in progress with several boron compounds that are more insoluble than colemanite. A study is now being made also of the major soil types of the state to determine the types where boron deficiency is most likely to occur.
Figure 4.—Toxic effect of highly soluble boron compounds. Top picture shows the reduction in stand of cotton from the addition to the soil of 30 pounds per acre of a highly soluble borate as compared with an equivalent quantity of boron in the relatively low-solubility colemanite.

Anderson Variety of Wheat Released: The Anderson variety of wheat was developed from the progeny of a cross between Leapland and Fronteira, which is a disease-resistant variety, by the Bureau of Plant Industry, U.S.D.A. All the seed this season will be distributed as planting seed through the South Carolina Crop Improvement Association.

Irrigation Experiments at Sandhill Station: An additional reservoir has been constructed at the Sandhill Station to determine the response of such crops as peaches, watermelons, corn, and other crops to different irrigation practices. The addition of water by overhead irrigation systems has been very beneficial in establishing young peach orchards in the Sandhill region, which are frequently seriously affected by prolonged droughts.
Soil Conditioners: The publicity given to Krilium and other commercial products advocated for improving soil aggregation or granulation has stimulated a lot of popular interest in soil structure and its effects on plant growth. The beneficial effects of these materials is due to their action in binding small soil particles together into larger granules which do not disintegrate when wet. Increasing the number of large stable granules causes an increase in the amount of large pore spaces, thereby improving aeration and enabling the soil to absorb rainfall more readily.

Investigations into the effect of various commercial aggregate stabilizers on our soils have been started at Clemson along with studies of the effects of crop rotations, sod crops, and deep-rooted legumes on soil structure.

These stabilizers are useful only on soils containing considerable silt and clay. Sandy soils present a different problem. They allow excessive leaching of plant nutrients and have limited water-holding capacity. Experiments on the use of bentonite for alleviating these conditions are being conducted on Norfolk sand at the Sandhill Station.
Spread of Black Shank of Tobacco: The rapid spread of the Black Shank disease in the flue-cured tobacco area increases the need for a more extensive tobacco breeding program. Resistant varieties seem to be the only practical control measure. The presence of Granville wilt and Fusarium wilt, which are soil-borne diseases, complicates the breeding projects, since there are only two satisfactory commercial varieties resistant to both of these diseases. There is only one variety available which is resistant to all three of these destructive diseases and it has inferior yielding ability. Special efforts are being made towards developing new disease-resistant varieties.

Sting Nematode Damage: Recently several additional parasitic nematodes have been found which cause serious crop losses in South Carolina. The sting nematode, which attacks cotton, corn, soybeans, and numerous other crops, is causing serious losses. Fortunately, tobacco is resistant to it.

Recent surveys showed that there was a reduction of 50 percent in the yields of cotton fields infested with sting nematode. Its presence in combination with the cotton wilt fungus often breaks the resistance of the wilt-resistant varieties. The sting nematode injures the root tissues and decreases the resistance of plants to the wilt fungus.

Adapted Varieties of Vegetables: It is necessary to maintain extensive plant breeding activities to meet the needs of truck crop producers for better varieties of vegetables. A number of new and improved varieties have been introduced and have been very satisfactory. The Wade snapbean, the Santee cucumber, and the Calumet sweet corn are outstanding contributions, and they are rapidly displacing the other varieties.

Methyl Bromide Fumigation for Tomato Plantbeds: Since suitable plants for the fall tomato crop are not available for purchase in July, the grower is forced to produce his own plants in outdoor beds under conditions of unfavorable temperature and moisture. Promising results have been secured on the horticultural farm at Clemson where tomato beds have been fumigated with methyl bromide at the rate of one pound per 100 square feet prior to seed-
Figure 6.—(a) Severe stunting and failure of corn caused by the sting nematode.

(b) Cotton is very susceptible to sting nematode; tobacco is very resistant to sting nematode.

In addition to the benefits from the control of weeds and nematodes, there is a marked stimulation in the growth of the tomato plants.
New Insecticide Formulation Developed: Prior to the development of a granular insecticide formulation at Clemson College, the application of insecticides to the soil has been unsatisfactory. With the new formulation, several insecticides may be applied either by air or with conventional fertilizer application equipment. The manufacturing industry was quick to recognize the future of this technique and has formulated several chemicals to be applied in the granular form.

Higher Production of Crossbred Calves: Experiments at the Coast Station have shown that crossbred calves are heavier at birth and grow faster than purebred calves. Both Brahman-Angus and Hereford-Angus crossbreds were tested in comparison with purebred Angus calves. The crossbred calves of both groups consumed considerably more creep-fed grain, but the faster growth compensated for the extra feed consumed.

Bermuda Grass Pasture Produces Most Feed: The pasture research program, first begun in 1929, has been continued and expanded, especially over the last few years. In summarizing the studies over the years, it has been found that common Bermuda grass has excelled all other pasture plants. In 17 years of pasture research at Clemson, Bermuda grass has proved its value. It may be a curse to the cotton farmer, but it is a blessing to the cattleman. So in planning a pasture program for the dairy farm, the greater use and the proper management of Bermuda grass is being emphasized.

A rye grass and crimson clover mixture has proved to be the best winter pasture combination for milking cows.

Improvement in Human Nutrition: The very high percentage of men in South Carolina rejected by draft boards for physical defects emphasizes the importance of improving the diet, which is one of the major factors in the physical development of young people. Since corn products are such important items in the diet of the people of the state, the Nutrition Department of the Station compounds and distributes an enrichment mixture which increases the vitamin and mineral content of corn meal. This service has been very helpful, particularly to small millers, in improving the nutritive value of corn meal and other corn products.
The cooperative extension work in agriculture and home economics aids in raising the immediate and long-time living standards of people, beginning with the average and low-average standards of rural people. To achieve such an objective, it is recognized that poor farming must give way to good farming, poor housing to better housing, and poor diets to good diets. Slow and low-producing hand methods must be replaced by faster, more productive mechanized methods. Production per man on the farm must be increased and quality and timeliness of production made to fit con-

Figure 1.—This illustration of a Spartanburg county 4-H Club girl represents the importance of 4-H Club activity, which is reaching over 50,000 boys and girls in South Carolina and aiding in the development of progressive agriculture and farm products.
sumers’ needs. Home work must be lightened through better homes, more home equipment, and a better understanding of health needs. Soils must be conserved and improved.

The Extension Service aids in the spread of useful and practical information relating to farm and home and in encouraging the application of such information through organized practical demonstrations, meetings, tours, and publications. Extension work represents the combined efforts of federal, state, and county governments in helping to make the needed changes, adjustments, and improvements.

Extension workers cooperate with farm people and with various public agencies in most of the things that are done. Two leading general farm organizations, the Farm Bureau and the Grange, are doing many constructive pieces of work in which extension cooperates. Extension maintains friendly cooperative relations also with Vocational Agricultural Education.

Figure 2.—In all county extension offices bulletins on farm and home problems are made available to people of the county.
In the way of printed information, 156 different extension bulletins, circulars, and information cards and reports on as many subjects are available for mailing on request. In addition, the county offices in each county have on hand a limited number of these publications for local use and distribution. Also many mimeographed reports and monthly letters on special subjects for limited distribution are issued.

Figure 3.—A demonstration in the use of supplemental irrigation in the growing of tobacco represents a trend much in evidence in South Carolina for a number of years.
The overall extension program for 1951, as worked out and sponsored jointly by the Extension Service and the State Agricultural Committee, which consists of one man and one woman leader from each county elected by the county agricultural committee, is summarized in these 15 points which indicate the important phases of extension work: 1, Balanced Farming; 2, Foods and Feeds; 3, Soil Conservation and Improvement; 4, Farm and Home Equipment and Supplies; 5, Grassland Farming for More Livestock, Dairying, and Poultry; 6, Cotton; 7, Tobacco; 8, Fruits and Vegetables; 9, Forestry; 10, Seeds and Plants; 11, Pests and Diseases; 12, Marketing; 13, Farm Homes and Other Buildings; 14, Farm Boys and Girls; 15, Health and Recreation.

The results of extension work show up in many ways. The tax base from which is derived the income for all public activities is improved. Basic soil conditions are improved, and the wise use of all natural resources is promoted. Varieties of plants and breeds of animals are improved. Efficiency is increased. Sound and informed leadership is developed. Youth is given greater opportunity for development.

One indication of the progress made in activities to which the Extension Service devotes its efforts is in the fact that most of the top agricultural production and yield records in South Carolina have been made during the past 10 years.

New high records that were made in 1951 are these:

- Tobacco, pounds produced in the state: 177,540,000
- Tobacco, yield per acre, pounds: 1,345
- Soybeans, bushels produced in the state: 1,038,000
- Soybeans, yield per acre, bushels: 12.5
- Wheat, bushels per acre: 20
- Cotton, pounds lint per acre: 389
- All cattle on farms, number: 427,000
- Eggs produced in state: 465,000,000
- Eggs produced per hen per year: 140
- Turkeys raised in state: 1,002,000
- Commercial broilers produced in state: 11,441,000
Besides the all-time records of production listed for the single year 1951, the high records made in other lines of production in recent years were closely approximated in 1951.

In the meantime, some of the greatest advances being made are in the field of marketing. Producers are using the varieties, practices, and methods that enable them to compete more successfully in the market place. The functions and purposes of the State Agricultural Marketing Commission and of the Extension Service Division of Markets are coordinated under one chief to give full opportunity to both lines of work and afford the best public service.

Many official activities of the Extension Service workers in connection with the above-mentioned results and other accomplishments for good cannot be outlined here for lack of space. Details of the work are given in the printed annual report of the Extension Service, which may be obtained free through the county extension agents or by writing to the Extension Service at Clemson, S. C.