FIFTY-SEVENTH ANNUAL REPORT

of the

BOARD OF TRUSTEES

of

The Clemson Agricultural College

to the

General Assembly of South Carolina

1946

The Clemson Agricultural College

RECORD

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<td>58</td>
</tr>
</tbody>
</table>
LETTER OF TRANSMITTAL

To the Members of the General Assembly
Columbia, South Carolina

Gentlemen:

The trustees of The Clemson Agricultural College are pleased to transmit herewith for your thoughtful consideration the Report of President R. F. Poole, for the fiscal year July 1, 1945 to June 30, 1946.

Members of the Board have reviewed the affairs of the several agencies of the college on three occasions during the past year and have found them entirely satisfactory.

Respectfully submitted,

W. W. Bradley
President, Board of Trustees

December 1, 1946.
REPORT OF THE PRESIDENT OF THE COLLEGE

Clemson, South Carolina
December 1, 1946

From R. F. Poole
President, The Clemson Agricultural College

To The Honorable W. W. Bradley
President, The Board of Trustees

Dear Sir:

With the cessation of war most of our staff members who were absent on military leave returned to the college.

During the war years new adjustments and changes in agriculture brought about new problems. The war activities required the services of many of our research and extension workers resulting in a curtailment of work which seemed vital to the fullest realization of the state's needs.

Today efforts are being made to reorganize the various staffs and to undertake the fullest diagnosis and solution of problems arising from labor shortages. This will require several years because during the war years very few men were trained for leadership and research in agricultural work. Within a few years there will be many promising men available from among the ex-service men who in large numbers are applying themselves earnestly in college.

I believe the public service units have done well during the past year. There is much evidence that they have served the public extensively in a satisfactory manner. I am happy to hand you some of the promising reports of their work. More detailed information will be carried in the separate annual reports of the Experiment Station and the Extension Service.

Respectfully submitted,

R. F. POOLE, President
REPORT OF THE TREASURER

Dr. R. F. Poole, President
The Clemson Agricultural College
Clemson, South Carolina

Dear Dr. Poole:

I have the honor of transmitting herewith my annual report of the financial affairs of the Clemson Agricultural College of South Carolina for the fiscal year July 1, 1945 to June 30, 1946 in accordance with an act of the General Assembly.

Respectfully submitted,
S. W. Evans,
Secretary-Treasurer

THE CLEMSON AGRICULTURAL COLLEGE
Collegiate Activities
FISCAL YEAR
JULY 1, 1945 to JUNE 30, 1946

INCOME

1—State Appropriation ___________________ $289,000.00
2—Privilege Fertilizer Tax ___ $210,600.00
   Less Cost Insp. & Analysis__ 38,960.58 171,639.42 $460,639.42
3—Federal Funds:
   Morrill-Nelson and Bankhead-Jones Funds
4—Tuition and Fees 92,270.38
5—Endowment Funds:
   Int. on Clemson Bequest 3,512.36
   Interest on Landscrip ___ 5,754.00 9,266.36
6—Miscellaneous Funds:
   Rents College Residences, Sales Electric
   Lights and Water ___________________________ 53,099.95
7—Army Program ___________________________ 49,213.13
8—Summer Session ___________________________ 20,294.43

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Income</td>
<td>Collegiate Activities__</td>
</tr>
</tbody>
</table>
## Collegiate Activities
Expenditures July 1, 1945—June 30, 1946

### Exhibit A

**A—Personal Service:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—Salaries:</td>
<td></td>
</tr>
<tr>
<td>Morrill-Nelson and Bankhead-Jones Fund</td>
<td>$45,841.20</td>
</tr>
<tr>
<td>Landscrip</td>
<td>5,754.00</td>
</tr>
<tr>
<td>Other Funds</td>
<td>428,832.62</td>
</tr>
<tr>
<td>2—Wages</td>
<td>45,394.09</td>
</tr>
</tbody>
</table>

**B—Contractual Services:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2—Travel</td>
<td>5,734.33</td>
</tr>
<tr>
<td>3—Telegraph and Telephone</td>
<td>3,135.18</td>
</tr>
<tr>
<td>4—Repairs</td>
<td>20,054.21</td>
</tr>
<tr>
<td>6—Heat, Lights &amp; Power</td>
<td>40,328.25</td>
</tr>
<tr>
<td>Other Services</td>
<td>8,113.43</td>
</tr>
</tbody>
</table>

**C—Supplies                   | Amount       |

**D—Fixed Charges              | Amount       |

**G—Equipment                  | Amount       |

**H-2—Buildings                | Amount       |

**3—Improvements               | Amount       |

**Refunds                      | Amount       |

**Transfers                    | Amount       |

<table>
<thead>
<tr>
<th>Total</th>
<th>Amount</th>
</tr>
</thead>
</table>

### Fertilizer Inspection and Analysis, Poison Analyses,
Analyses of Water, Soils, Manures, Etc.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$19,578.65</td>
</tr>
<tr>
<td>A-2 and A-3, Wages and Legal Services</td>
<td>2,270.52</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>4,264.61</td>
</tr>
<tr>
<td>B-3 Telegraph and Telephone</td>
<td>203.45</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>345.84</td>
</tr>
<tr>
<td>B- Other Services</td>
<td>918.48</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>10,649.59</td>
</tr>
<tr>
<td>D- Fixed Charges</td>
<td>35.54</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>693.90</td>
</tr>
<tr>
<td>Total</td>
<td>$38,960.58</td>
</tr>
</tbody>
</table>
(These funds, paid by the students for their living and other expenses, are kept entirely separate. None of this money is used to pay the cost of teaching.)

**Expenditures:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$40,481.88</td>
</tr>
<tr>
<td>A-2 Wages</td>
<td>99,322.14</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>572.97</td>
</tr>
<tr>
<td>B-3 Telegraph and Telephone</td>
<td>1,551.14</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>25,516.35</td>
</tr>
<tr>
<td>B-6 Heat, Lights, and Power</td>
<td>30,461.96</td>
</tr>
<tr>
<td>B-7 Other Services</td>
<td>4,557.62</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>331,267.69</td>
</tr>
<tr>
<td>D- Fixed Charges</td>
<td>6,827.11</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>250.02</td>
</tr>
<tr>
<td>H-2 Buildings</td>
<td>407.60</td>
</tr>
<tr>
<td>Transfer to Athletic Department</td>
<td>6,137.96</td>
</tr>
<tr>
<td>Transfer to Concert Series</td>
<td>2,829.07</td>
</tr>
<tr>
<td>Transfer to YMCA</td>
<td>3,308.88</td>
</tr>
<tr>
<td>Refunds to Students</td>
<td>33,770.77</td>
</tr>
</tbody>
</table>

Total: $587,263.16

**Student Banking Account**

**Exhibit C**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance on Hand July 1, 1945</td>
<td>$29,115.89</td>
</tr>
<tr>
<td>Deposits-Current Year</td>
<td>292,763.13</td>
</tr>
<tr>
<td>Checks Paid Current Year</td>
<td>$219,902.38</td>
</tr>
<tr>
<td>Balance June 30, 1946</td>
<td>101,976.64</td>
</tr>
</tbody>
</table>

Total: $321,879.02
### A. S. T. Reserve Program

**Exhibit D**

#### Receipts:

- Credit Balance Brought Forward: $59.56
- Payments By Treasurer of U.S.: $131,664.87
- Payments By Clemson Agricultural College: $718.25
- Payments By L. C. Martin Drug Company: $3,653.24
- Payments By Other: $23.07
- Debit Balance Carried Forward: $2,498.20

#### Expenditures:

- Use of Facilities: $4,985.81
- Instruction: $63,183.39
- Medical Service: $6,041.82
- Subsistence: $47,577.85
- Maintenance and Operation: $16,828.32

Total Expenditures: $138,617.19

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### Smith-Lever Agricultural Extension Work

**Exhibit E**

#### Receipts:

- Appropriations:
  - Federal: $760,440.61
  - State: $325,000.00

Total Receipts: $1,085,440.61

#### Expenditures:

- Salaries: $838,507.21
- Wages: $6,523.78
- Travel: $161,106.33
- Telegraph and Telephone: $8,519.00
- Repairs: $8,430.52
- Heat, Lights, and Power: $1,242.41
- Other Services: $18,901.85
- Supplies: $17,538.97
- Fixed Charges: $3,707.40
- Equipment: $20,963.14

Total Expenditures: $1,085,440.61
### Camp Cooper
**Exhibit F**

**Receipts:**
- Appropriations ____________________________  $ 2,000.00

**Expenditures:**
- A-2 Wages ____________________________  $ 648.45
- B-4 Repairs ____________________________  85.87
- B- Other Services ___________________  30.00
- C- Supplies ____________________________  1,090.68
- G- Equipment ____________________________  145.00  $ 2,000.00

### Camp Long
**Exhibit G**

**Receipts:**
- Appropriation ____________________________  $ 2,000.00

**Expenditures:**
- A-1 Salaries ____________________________  468.00
- A-2 Wages ____________________________  273.75
- B-4 Repairs ____________________________  24.20
- B-6 Heat, Lights, and Power ____________  294.51
- B- Other Services ___________________  124.45
- C- Supplies ____________________________  590.09
- D- Fixed Charges ___________________  6.00
- G- Equipment ____________________________  143.50
- H-3 Improvements ____________________________  75.50  $ 2,000.00

### State Soil Conservation Committee
**Exhibit H**

**Receipts:**
- Appropriation ____________________________  $ 8,127.40

**Expenditures:**
- A-3 Special Payments ____________________________  $ 198.00
- B-2 Travel ____________________________  4,310.44
- B- Other Services ___________________  3,409.37
- C- Supplies ____________________________  209.59  $ 8,127.40
South Carolina Experiment Station Federal Funds
(Adams, Hatch, Purnell and Bankhead-Jones)

Exhibit I

Receipts:
Receipts from Treasurer of the United States:
Adams Fund $15,000.00
Hatch Fund 15,000.00
Purnell Fund 60,000.00
Bankhead-Jones Fund 64,344.56 $154,344.56

Expenditures:
A-1 Salaries $97,804.14
A-2 Wages 13,917.32
B-2 Travel 3,486.73
B-3 Telegraph and Telephone 772.06
B-4 Repairs 1,543.23
B-6 Heat, Lights and Power 458.73
B- Other Services 3,343.48
C- Supplies 12,966.30
D- Fixed Charges 1,110.50
G- Equipment 12,522.00
H-2 Buildings 6,253.73
H-3 Improvements 166.34 $154,344.56

Agricultural Research

Exhibit J

Expenditures:
A-1 Salaries $45,076.86
A-2 Wages 15,923.61
B-2 Travel 3,522.08
B-3 Telegraph and Telephone 247.97
B-4 Repairs 1,108.02
B- Other Services 1,840.33
C- Supplies 10,754.93
D- Fixed Charges 4,434.64
G- Equipment 2,091.56 $85,000.00
## Edisto Experiment Station
### Exhibit K

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$15,487.02</td>
</tr>
<tr>
<td>A-2 Wages</td>
<td>13,268.58</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>120.95</td>
</tr>
<tr>
<td>B-3 Telegraph and Telephone</td>
<td>157.91</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>2,151.23</td>
</tr>
<tr>
<td>B-6 Heat, Lights and Power</td>
<td>1,049.95</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>2,486.26</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>5,040.42</td>
</tr>
<tr>
<td>H-3 Improvements</td>
<td>237.68</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$40,000.00</strong></td>
</tr>
</tbody>
</table>

## Truck Experiment Station
### Exhibit L

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$9,414.94</td>
</tr>
<tr>
<td>A-2 Wages</td>
<td>6,606.76</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>282.02</td>
</tr>
<tr>
<td>B-3 Telegraph and Telephone</td>
<td>241.39</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>1,129.77</td>
</tr>
<tr>
<td>B-6 Heat, Lights and Power</td>
<td>155.37</td>
</tr>
<tr>
<td>B- Other Services</td>
<td>1,640.33</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>3,297.71</td>
</tr>
<tr>
<td>D- Fixed Charges</td>
<td>93.27</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>1,737.18</td>
</tr>
<tr>
<td>H-2 Buildings</td>
<td>10,000.00</td>
</tr>
<tr>
<td>H-3 Improvements</td>
<td>401.26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$35,000.00</strong></td>
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</tbody>
</table>

## Crop Pests and Diseases
### Exhibit M

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$6,884.16</td>
</tr>
<tr>
<td>A-2 Wages</td>
<td>468.80</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>1,145.68</td>
</tr>
<tr>
<td>B-3 Telegraph and Telephone</td>
<td>15.65</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>32.34</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>923.05</td>
</tr>
<tr>
<td>D- Fixed Charges</td>
<td>44.72</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>485.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$10,000.00</strong></td>
</tr>
</tbody>
</table>
## Pee Dee Experiment Station

### Exhibit N

**Expenditures:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$10,988.29</td>
</tr>
<tr>
<td>A-2 Wages</td>
<td>10,128.05</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>79.10</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>1,211.26</td>
</tr>
<tr>
<td>B-6 Heat, Lights and Power</td>
<td>732.57</td>
</tr>
<tr>
<td>B- Other Services</td>
<td>69.70</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>4,140.41</td>
</tr>
<tr>
<td>D- Fixed Charges</td>
<td>445.82</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>2,204.80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$30,000.00</td>
</tr>
</tbody>
</table>

## Land Use Project

### Exhibit O

**Expenditures:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$2,866.66</td>
</tr>
<tr>
<td>A-2 Wages</td>
<td>2,609.87</td>
</tr>
<tr>
<td>B-3 Telegraph and Telephone</td>
<td>84.00</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>1,019.53</td>
</tr>
<tr>
<td>B-6 Heat, Lights and Power</td>
<td>9.70</td>
</tr>
<tr>
<td>B- Other Services</td>
<td>1,012.85</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>1,706.71</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>690.68</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$10,000.00</td>
</tr>
</tbody>
</table>

## Horticultural Products Laboratory

### Exhibit P

**Expenditures:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$3,400.00</td>
</tr>
<tr>
<td>A-2 Wages</td>
<td>2,851.48</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>76.16</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>267.28</td>
</tr>
<tr>
<td>B-6 Heat, Lights and Power</td>
<td>610.38</td>
</tr>
<tr>
<td>B- Other Services</td>
<td>157.25</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>728.71</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>1,908.74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$10,000.00</td>
</tr>
</tbody>
</table>
Lime and Forage Investigation
Exhibit Q

<table>
<thead>
<tr>
<th>Expenditures:</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-2 Wages</td>
<td>$3,404.26</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>$1,870.60</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>$4,725.14</td>
</tr>
<tr>
<td>Total</td>
<td>$10,000.00</td>
</tr>
</tbody>
</table>

Farm Mechanization Research
Exhibit R

<table>
<thead>
<tr>
<th>Expenditures:</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1 Salaries</td>
<td>$2,600.00</td>
</tr>
<tr>
<td>B-2 Travel</td>
<td>$143.84</td>
</tr>
<tr>
<td>B-4 Repairs</td>
<td>$95.88</td>
</tr>
<tr>
<td>C- Supplies</td>
<td>$652.42</td>
</tr>
<tr>
<td>G- Equipment</td>
<td>$6,507.86</td>
</tr>
<tr>
<td>Total</td>
<td>$10,000.00</td>
</tr>
</tbody>
</table>
REPORT OF BOARD OF VISITORS

To The Board of Trustees
The Clemson Agricultural College
Clemson, South Carolina

Gentlemen:

We realize the importance of sane and conservative thinking and recommendations by the 1946 Board of Visitors as applied to one of the leading educational institutions of the country. We realize also that our recommendations, in order to become effective, will need to clear several hurdles, such as the approval and endorsement by the Board of Trustees, the approval and enactment by the General Assembly of South Carolina, and a directive public sentiment as expressed by the people of this state. After all, the will of the people usually prevails in all public questions, and it is this public opinion that finally will require the adequate support of education in South Carolina.

It will be safe to say that never before in the history of the state has there been such necessity for the adequate support to all of our higher educational institutions in order that the increasing number of youth desiring to pursue their education beyond the high school stage may be adequately cared for. Conditions now are so different following World War II, and the consequent disruption of established customs, that dealing with these matters requires careful consideration and progressive thinking.

While we are thinking as a Board of Visitors for one of the educational institutions of the state, we realize that similar conditions exist in practically every one of our state educational institutions. We feel, however, that the demand is so urgent and the need so great that we are justified in recommending a program of development at Clemson College which will adequately meet the needs of the young people of the state who desire to attend even though the cost of such improvements will be great.

Your Board of Visitors, therefore, recommends that there be a concerted effort on the part of the state educational institutions for an overall development. This must be supported by the friends of each institution in order that it may be accomplished. From information we have, it will take probably a large sum for all these institutions, an expenditure which will, in our opinion, yield a very large dividend as an investment in the future development of our state. We are of the opinion that it would be better to do this now than to do it little by little each year. To build by piecemeal would deprive many of the use of these educational in-
stitutions. To do it at once will open up vistas of accomplishment and achievement which will show the wisdom of such plan.

Speaking specifically of Clemson College, we find need for a great many new buildings and renovations to old buildings as provided in a recommendation made by the Board of Trustees to the General Assembly. This need is based upon the necessary enlargement of this institution to care for those who are knocking at its doors seeking admittance to a broader field of usefulness in South Carolina.

After three days of intensive study and careful personal inspection and investigation of the needs of this institution, we find much to commend in the very businesslike manner in which the present facilities are being utilized.

The most urgent need on the campus at this time seems to be an enlarged steam plant, and we recommend that this be attended to before students arrive in the fall.

We noted in this inspection the very crowded conditions in many of the departments and the inadequacy of facilities in others. This is particularly noticeable in the Engineering Department, the Chemistry Department, the Farm Machinery Department, The Extension Department, and the Chapel and Hospital facilities.

In view of the unique position which the YMCA occupies on the Clemson campus and in further view of the fact that the "Y" Advisory Board has in hand voluntary contributions aggregating approximately $50,000, it is suggested that the Board of Trustees have an early conference with the "Y" Advisory Board with a view to taking appropriate action to provide for needed expansion through further voluntary contributions.

We recommend that salaries of administrative officials and educational staff be increased to a figure in keeping with what others are receiving at similar institutions so that instructors may be induced to come to Clemson and to retain at Clemson an adequate teaching force.

Particularly do we desire to call attention to the need for increased livestock production in South Carolina, the development of soil conservation in all sections of the state, the growing of food for the people and feed for livestock, the development of our forestry resources, the expansion of rural electrification, drainage of our low lands, and instruction to farmers in mechanization of their farm work, as well as increasing facilities for marketing their products. In all of these fields the need is for a more intensive program.

We have not made a number of specific recommendations to your Board because we feel that in recommending the comprehensive program
of development we have included the many items which would have been recommended as needed construction. We desire specifically to recommend the re-establishment of a farmers' week each summer at the college so that persons from all sections may get together and become acquainted with each other and with this fine institution.

We recommend that arrangements be made so that each of the four classes, Senior, Junior, Sophomore, and Freshman, be permitted to select one representative from each class to be available for conferences with the Board of Visitors.

We are pleased to recommend to the Board of Trustees the appointment of W. W. Smoak of Walterboro, as the hold-over member of the Board of Visitors for 1947.

The field of Clemson College is, of course, the entire state and its influence reaches into remote sections and into every activity of a contented and prosperous citizenship. It is, therefore, important that every support be given its program of usefulness.

"Give me men to match my mountains
Give me men to match my plains"

may be changed to—

"Give me men to develop my mountains
Give me men to develop my plains."

This is the purpose of Clemson College.

We desire to extend to Dr. R. F. Poole, President, to Mr. J. H. Woodward, Secretary of the Alumni Association, and to all officials and persons connected with the college, our thanks for their unfailing thoughtfulness and many courtesies during our three days of delightful enjoyment of such splendid hospitality and in such a delightful atmosphere. We are grateful for this opportunity to become better acquainted with so great an educational institution.

Respectfully submitted,

Charlie Peace, Chairman
W. W. Smoak, Secretary
Hugh Agnew
John Auten
S. H. Benjamin
Henry S. Johnson

A. G. Kennedy
E. C. McArthur
Tom B. Pearce
Wade Stackhouse
L. E. Stroud
W. E. Tillotson
Dear Dr. Poole:

I have the honor to transmit herewith the report of the Department of Fertilizer Inspection and Analysis for the fiscal year ending June 30, 1946.

Yours very truly,

H. P. Cooper, Dean and Director

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INSPECTION AND ANALYSIS OF COMMERCIAL FERTILIZERS

The Department of Fertilizer Inspection and Analysis, consisting of a staff of 9 part-time inspectors located in various sections of the state and 5 chemists located at Clemson College, made numerous inspections and sampled and analyzed 4456 lots of commercial fertilizers during the fiscal year ending June 30, 1946. Over 90 percent of the samples came directly from fertilizer found on farms; thus, in the case of deficiency, the refund was made to the ultimate consumer rather than through the fertilizer dealer. The purchasers of all fertilizers which varied from the guaranteed analyses more than the percentage allowed by law were notified and sent copies of the letter and report to the manufacturer, as to the amount that the manufacturer must pay them as a refund or penalty.

In addition to the inspection and analysis of commercial fertilizers, this department normally analyzes unexploited waters, minerals, etc. It also makes analyses of parts of human bodies where poisons are suspected as the cause of death. The following is a summary of the activities of the department during the fiscal year 1945-1946.
<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity/Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lots of fertilizer sampled and analyzed</td>
<td>4,456</td>
</tr>
<tr>
<td>*Number of samples deficient</td>
<td>449</td>
</tr>
<tr>
<td>*Percentage of deficient samples</td>
<td>10.08</td>
</tr>
<tr>
<td>*Refunds to farmers, account of deficiency</td>
<td>$17,231.81</td>
</tr>
<tr>
<td>Number of toxicological examinations</td>
<td>11</td>
</tr>
<tr>
<td>Number of water samples analyzed</td>
<td>21</td>
</tr>
<tr>
<td>Number of bags underweight, dealers' warehouses, seized</td>
<td>6,939</td>
</tr>
<tr>
<td>Average underweight per bag in pounds</td>
<td>4</td>
</tr>
<tr>
<td>Number of bags seized for reasons other than underweight</td>
<td>3,354</td>
</tr>
<tr>
<td>Number of bags found underweight on farms</td>
<td>2,132</td>
</tr>
<tr>
<td>Total receipts from fines collected</td>
<td>$225.00</td>
</tr>
<tr>
<td>Total receipts from refunds (dealer unable to furnish names of ultimate consumers)</td>
<td>$2,849.14</td>
</tr>
<tr>
<td>Total receipts from registration fees</td>
<td>$1,425.00</td>
</tr>
<tr>
<td>Total receipts from tax tag sales</td>
<td>$206,822.52</td>
</tr>
</tbody>
</table>

* As of August 30, 1946.
Dear Dr. Poole:

The following report covers the activities of the Department for the fiscal year ending June 30, 1946, in the control and eradication of contagious and infectious diseases of livestock and poultry.

The continual increase in livestock and poultry production has resulted in many additional requests for assistance from the Department. Our staff of workers has rendered the most effective service possible with the small number of employees made available by a small appropriation.

Very truly yours,

R. A. Mays,
State Veterinarian and Director

ANAPLASMOSIS

Anaplasmosis of cattle has been definitely diagnosed for the first time in this state during the past year. The disease is known to exist in approximately one-half of the states and many foreign countries. A minute parasite invades the red blood cells, resulting in a marked anemia and depression, and may be fatal to 25 to 50 percent of the animals affected. Several species of ticks, horse flies, and mosquitoes have been found to be carriers of the causative agent of this disease. No preventive or effective treatment has been found. Much research work is being carried on in the United States and foreign countries in an endeavor to develop a method of prevention and control.
BRUCELLOSIS OF CATTLE

Abortion, sterility, and diminished milk and meat production are among the train of evils to follow infection of cattle with the Brucella Abortus germ, the causative agent of Brucellosis or Bang's disease. We have no accurate estimate of the losses in this state as result of this disease. However, it has been conservatively estimated that the losses over the entire country may be at least $30,000,000 annually. The disease is introduced into healthy herds primarily by the addition of infected animals. The germ also causes undulant fever in human beings, but this danger can be greatly reduced by pasteurizing the milk and by taking proper precautions in handling infected animals. In order to make an accurate diagnosis, it is necessary to obtain a blood sample for laboratory examination.

During the year 39,285 blood samples were tested in 2,897 herds and 1.9 percent infected (reactor) cattle were found in this group.

The county-wide area plan of testing has been conducted during the year, and all of the 17 counties recognized as Modified Accredited counties continue to maintain this status. Additional county-wide work will be extended as funds become available for the work.

Under the new Accredited Herd Plan we have endeavored to classify the herds in one of four groups. After making an initial test of all cattle in the herd, the owner assists the veterinarian in deciding which plan is best suited for his herd according to the degree of infection revealed on initial or check test. Herds under this plan are tested at frequent intervals depending upon the percentage of infection present. Under this plan we have over 100 herds whose owners have signed up to operate under this plan and we are receiving many additional requests for information relative to obtaining a disease-free Accredited herd.

Indemnity paid for cattle whose owners chose the test and slaughter method, under this plan, averaged $13.75 per cow slaughtered during the year. An equal amount was also paid by the Federal Government.

Progress has been made in controlling the infection in some herds by injecting calves, four to eight months of age, with Brucella vaccine. During the year 260 calves were injected in cooperation with the state and federal workers. Some owners have decided to have adult cattle injected with Brucella vaccine; however, work along this line has not progressed to such an extent as to recommend its use on adult animals except in badly infected herds.
BLACKLEG

The organism causing this disease enters the body through small wounds in the skin or the mucous membrane of the mouth and quickly causes extreme symptoms, including rapidly swelling tumors, high fever, great depression, and violent convulsions. This disease is highly fatal and death usually occurs within 36 hours after the disease is observed. There is no effective treatment for animals after the disease makes its appearance. The disease is usually confined to young animals under 18 months of age. During the year 3,964 cattle and 259 premises were vaccinated against this disease.

EQUINE ENCEPHALOMYELITIS

This is a disease of the brain affecting horses and mules and is very similar to a disease in humans known as "sleeping sickness". Very few animals were lost as result of this disease in the state during the past year. On 102 premises we vaccinated 195 horses and mules with favorable results.

FOWL CHOLERA — FOWL TYPHOID — PARA TYPHOID

These infections cause considerable losses in poultry flocks, especially those kept under insanitary conditions. Each disease is caused by a specific bacterium which is found in the blood stream and various internal organs. An effective vaccine has not been found for this group of diseases; however, some experimental work has been done in an endeavor to immunize birds against the disease and favorable reports may be received in the near future. Sanitary precautions are perhaps the most valuable means of preventing and controlling these diseases. One thousand and thirty-two birds were injected with bacterins during the year as an aid in controlling fowl cholera and typhoid.

HEXAMITIASIS

Hexamitiasis is an acute infectious disease, primarily of turkeys, but which occurs in pigeons, quail, ducks, and chukar partridges. This disease has been found in turkeys examined in the laboratory during the year. The exact extent of the disease among flocks in the state is not known, but it has been found in birds sent into the laboratory from various sections of the state. This is a disease primarily of young poults, resistance increasing as the birds reach maturity. The symptoms noted in infected poults are similar to those seen in some other diseases and a specific diagnosis cannot be made without the use of laboratory facilities. The course of the disease is usually acute with death occurring within 10 days after the initial symptoms are observed. Poults which survive are often stunted and many of them become carriers of the infection. The
disease usually is contracted by birds ingesting contaminated material, such as feed, soil, and water. The death rate may vary to as much as 90 percent of the flock. There appears to be a difference of opinion among workers regarding the value of medicine in controlling this disease. Sanitation, segregation, and changing of birds from one field to another as they become older are of value in controlling this disease.

**TRICHOMONIASIS**

This is a protozoan infection found in turkeys, chickens, and pigeons. During the year this disease was found in many groups of turkeys and one chicken. Birds suffering from trichomoniasis show droopiness and depression, little or no appetite, sagging wings, and emaciation. In young birds the disease usually causes death within a day or two, while the older fowls may live for a much longer period of time. The mortality ordinarily is not so high, although in some cases when birds are kept under unfavorable sanitary conditions, the losses have been known to exceed 75 to 80 percent of poults in a group. Affected birds pass the causative organisms out in the droppings, contaminating food and drinking water. Susceptible birds pick up the infection by digesting some type of contaminated material. Some birds are carriers of the disease after they survive. Diagnosis of this disease is made by microscopic examination of material obtained from the digestive tract of the birds. One type of the disease is found in the upper digestive tract, while another is located in the lower part of the digestive tract. The importance of sanitation should be stressed in controlling the disease. Many medicinal preparations have been used in treating infected birds with somewhat varied results. Copper sulphate, added to the drinking water for a period of two or three days, at the rate of 1 part of copper sulphate to 2000 parts of water, appears to give as favorable results as most any treatment used at the present time.

**BLACKHEAD**

Blackhead (infectious enterohepatitis) is a subacute chronic infectious disease, involving the ceca and liver. It is primarily a disease of turkeys, but other fowls are sometimes affected and act as carriers, resulting in the loss of many poults where they range on the same ground. This disease usually causes the death of many birds in the state. The disease is caused by a microscopic protozoan which can only be recognized on postmortem examination. Young poults raised on noninfected range rarely develop the disease. In infected poults the death rate is high and may kill practically all infected birds. When the disease develops in older birds, the losses are not quite so severe. Many drugs have been used in treating turkeys infected with blackhead, but the results have been very disappointing. There are no substitutes for sanitation and hygiene in raising turkeys.
LEUCOSIS, FOWL PARALYSIS AND OTHER FORMS OF AVIAN LEUCOSIS COMPLEX

The annual loss as result of the various forms of fowl paralysis is perhaps as high as or higher than any other disease we have among poultry in South Carolina. All types of the disease have been diagnosed in the state. The disease was first observed in Newberry county as far back as 1923. The causative agent of this disease has not been isolated, but it appears to be some type of virus. Medicinal treatment is of little value in controlling the disease.

PULLORUM DISEASE

Pullorum disease is produced by a specific germ which is transmitted through the egg to the young chick and poult. In order to control the spread of this disease, it is necessary to test a blood sample from the adult hens and males, eradicating all infected birds from the breeding flocks. In many cases it is necessary to test a flock several times prior to the hatching season. During the past year a total of 83,420 blood tests was made under the supervision of the department. As a result of these tests, 3,119 infected breeders were eradicated, resulting in a greater livability of the young birds than if these carriers had not been removed.

NEWCASTLE DISEASE
(Avian Pneumoencephalitis)

This disease is caused by a filterable virus found in the lungs, brain, spleen, and blood during the early stages of the disease in affected chickens. Since the appearance of the disease in California about 10 years ago, it has spread to 31 states and is doubtless present in other states, but it has not been recognized because of the difficulty in making a diagnosis. We have found many groups of chickens affected with symptoms of the disease, and in these flocks owners have reported a death rate as high as 50 percent of the birds. There is a definite need for expansion of our laboratory facilities and adequately trained personnel to assist the poultry growers in preventing and controlling this disease.

HOG CHOLERA

Hog cholera virus continues to cause the deaths of many hogs in the state each year. The infection appears to remain on farms where very many hogs are kept. The first recorded outbreak of the disease in the United States occurred in 1833 in the State of Ohio. The losses in South Carolina during the past year have been comparatively small in proportion to the number of hogs on the farms. We received requests for assistance in treating hogs against cholera from 9,613 farms and treated a total of 112,697 animals.
HEMMORRHAGIC SEPTICEMIA

Hemorrhagic septicemia of cattle was prevalent in a few isolated sections of the state, but the losses were not so heavy as result of the presence of this disease. During the year we treated 211 herds of cattle, consisting of 6,150 animals, with bacterins for the prevention and control of the disease.

INFECTIOUS KERATITIS

Infectious keratitis is a disease of cattle often causing animals to temporarily lose their eyesight. Affected animals frequently fail to consume sufficient food to maintain normal growth. During the year 3,044 cattle were treated for this condition on 55 farms in the state.

FOWL POX

The virus of fowl pox, which is found on many poultry farms, causes an outbreak of pox among chickens and turkeys during all seasons of the year. However, it appears to cause more trouble during the fall and winter months. Chickens and turkeys affected with this disease do not thrive, resulting in a decreased egg production. The disease may be prevented by treating the individual birds preferably when from four to 12 weeks of age. A total of 29,410 birds was treated on 63 farms.

RABIES

This disease affects many species of domestic and wild animals. The dog seems to be the principal carrier of this disease; however, during recent years foxes affected with this disease have caused considerable trouble in some sections of the state. During the year we assisted livestock owners on 239 farms in treating 555 dogs, 43 cows, 5 mules, and 4 horses with rabies vaccine.

BOVINE TUBERCULOSIS

All counties in South Carolina are classified as Tuberculosis-free Modified Accredited Areas. In check-testing work during the past year, less than one-half of one percent infection was found, and the U. S. Department of Agriculture, Bureau of Animal Industry, continues the classification of the entire state as a Tuberculosis Modified Accredited one. In cooperation with the Federal Government 925 herds were tested, consisting of 18,575 animals. Forty-one reactors were found on seven premises; the infected animals have been slaughtered and the premises placed under quarantine. All animals on these infected premises are being retested at periodic intervals in order to eliminate any additional infection which might spread as result of the presence of the disease on
these farms. Indemnity was paid to owners who slaughtered infected animals in accordance with rules and regulations, as outlined cooperatively between the State of South Carolina and the U. S. Department of Agriculture, Bureau of Animal Industry.

DEPUTY STATE VETERINARIANS

During the year 60 practicing veterinarians, deputized by the department, rendered much valuable assistance to the livestock industry in the state in making investigations and treating for the control and eradication of contagious and infectious disease in localities where it was not possible to send one of our full-time assistant state veterinarians. These men are employed on a per diem basis for the number of hours spent in taking care of requests referred to them by the department. With the return of veterinarians from the armed services, we are glad to report veterinarians are beginning to practice in many sections which have had insufficient veterinary service during the past years.

LABORATORY SERVICE

The service rendered by the laboratory to the livestock and poultry owners was of inestimable value during the past year. Many livestock owners took advantage of this service by having various specimens from all species of animals examined in order to determine the cause of the trouble among their poultry and livestock. When a diagnosis was made, suggestions were given to prevent, as much as possible, further losses in the infected herds and flocks. During this period 123,046 specimens were examined in the laboratory. There is a definite need for further expansion of our laboratory facilities to aid livestock and poultry owners in making the proper diagnoses of diseased conditions present among their animals and birds.

MISCELLANEOUS SERVICE

In addition to major functions performed by representatives of this department, much assistance was rendered by correspondence and telephone conversations. We also assisted with the disease control work in connection with the State Fair, 4-H Club exhibits, and livestock sales held at various cities in the state. The department endeavors to encourage and promote the dairy industry by assisting in the testing of animals consigned to the promotional sales and approving health certificates for the interstate shipment of animals purchased by out-of-state buyers.

Progress is being made in improving the inspection service of animals shipped into the state for immediate slaughter purposes. The health requirements covering the admission of livestock into the state have been revised in accordance with the latest available information on the control of contagious diseases among incoming animals and poultry.
REPORT OF THE
SOUTH CAROLINA STATE CROP PEST COMMISSION

Dr. R. F. Poole, President
The Clemson Agricultural College
Clemson, South Carolina

Dear Dr. Poole:

I have the honor to transmit herewith the Annual Report of the Crop Pest Commission for the fiscal year ending June 30, 1946.

Very truly yours,
H. P. Cooper, Dean and Director

Nursery Inspection.—The law requires that all nurseries within the state be inspected at least once annually. In accordance with these regulations the inspections were begun early in July and completed in late August. Inspections of nursery stock were made in every county of the state except nine. A total of 130, distributed as follows: Abbeville 1, Aiken 3, Anderson 12, Barnwell 1, Beaufort 1, Berkeley 1, Calhoun 1, Charleston 8, Chester 1, Clarendon 1, Colleton 1, Darlington 6, Dorchester 3, Edgefield 7, Florence 3, Georgetown 2, Greenville 13, Greenwood 3, Hampton 2, Horry 1, Kershaw 3, Laurens 1, Lexington 6, McCormick 2, Marlboro 3, Newberry 2, Oconee 7, Orangeburg 5, Pickens 8, Richland 5, Spartanburg 5, Sumter 7, Union 1, Williamsburg 1, and York 3. The combined acreage of these nurseries is approximately 500, which is less than that for previous years. During the war years the nurseries were unable to expand due to labor shortage and scarcity of lining out stock. Beginning early this summer (1946), however, renewed interest was taken by the older nurserymen, and indications are that there will be quite a few new nurseries established during the year.

As a general rule, the nurseries were in good condition, but in some of the smaller ones, the weeds were allowed to grow, making them look rather abandoned and neglected. The chief cause of this seeming neglect was the high cost and scarcity of labor. The nursery business has been very satisfactory, practically all of the stock being sold locally. The demand for nursery stock in South Carolina has always been greater

than the supply, necessitating the importation from other states of considerable quantities of stock, especially of fruits.

Nursery pests occurred in about the usual numbers, but very few species doing serious damage were found. Twenty-nine insect pests and plant diseases were noted during the inspection period. Most of these were of minor importance and did not require special control or restrictive measures. There were three pests, which require efficient and persistent control practices to prevent serious damage to certain nursery plants. The nurserymen are doing a fair job in the control of these pests, but the continued supervision of the inspector is necessary to see that the control measures are carried through. The insects are, cottony cushion scale, camellia and tea scale, and dieback, a disease of camellias. It is not sure what the causal organism of dieback is, but work is being done on this disease by both federal and state agencies and it is hoped that definite information regarding the cause and control may be available soon.

In order to prevent the spread through the shipment of nursery stock of the serious virus diseases of peaches (phony peach, yellows, etc.), the regulations require that all peach trees within a mile radius of nurseries growing peach stock be inspected prior to June 30 of the year in which the stock is sold. Last year only one nursery growing 8,000 trees required this inspection. To clear this nursery for certification it was necessary to inspect 30 properties and 7,273 peach trees.

After the nurseries have been certified, and if the stock is to be shipped, it is necessary that the nurseryman secure permit tags issued by the Commission, one to be attached to each bundle, bale, package, or other container. For this purpose last year, there were issued 7,195 permits.

Greenhouse Inspections.—The law also requires that greenhouses receive at least one inspection during the year in order that injurious pests may not be disseminated by means of the stock grown in these establishments. This inspection is usually made in late October and November when the greatest number of plants is available for observation.

The number of greenhouses inspected remained the same as for the previous season, though additions were made to several of the larger houses, increasing considerably the area under glass.

Small and scattered infestations of the more common insect pests and plant diseases were found in most of the houses but none in sufficient numbers to justify refusal of certification. The Argentine ant, which is probably the most important pest, still may be found in a couple of the greenhouses, but the numbers are gradually being reduced. These infestations do not occur in any of the wholesale houses and, therefore, do not
create a serious menace. Their presence in any house is undesirable, and efforts toward complete eradication will be continued. Poinsettia root-aphid did some damage in two greenhouses, but approved methods of control prescribed by the inspectors afforded relief from this pest. Branch-rot of carnations is of considerable importance in some of the houses and seems rather difficult to control. Occasionally the operators will let some of the common pests, such as red spiders and thrips multiply in sufficient numbers to cause serious injury to the plants, but as a general rule, they are sufficiently versed in control of the more common pests as to require no additional aid. Much information regarding control is given by the inspector at the time the inspection is made. Fifty-two greenhouses, one or more in each of the following cities, were inspected last season: Abbeville, Aiken, Anderson, Camden, Charleston, Clinton, Columbia, Darlington, Easley, Florence, Gaffney, Greenville, Greenwood, Gray Court, Hartsville, Laurens, Leesville, Newberry, North Augusta, Orangeburg, Owens, Pacolet, Rock Hill, Spartanburg, and Sumter. The area under glass covered by these greenhouses is approximately 598,650 square feet.

**Interstate Regulations.**—While no actual inspection work is required in connection with interstate shipments, there is considerable office work involved. All out-of-state nurseries must file duplicate copies of their current year’s inspection certificates showing that the nurseries have been inspected and certified by the proper officials of the state of origin. Formally all out-of-state nurseries were required to file duplicate invoices of the stock shipped and to attach South Carolina nursery permit tags in addition to the permit of the state of origin, but several years ago this procedure was modified whereby states could enter into reciprocal agreements with each other. South Carolina, therefore, does not require duplicate invoices and the purchase of the South Carolina permit tags except of those states which require the same of our nurserymen. It is the duty of this office to issue interstate tags to nurseries in those states not having reciprocal agreements. There were issued last year to nurseries in states not having reciprocal agreements 2,425 permit tags. Two hundred fourteen nurseries in 28 states registered to do business in South Carolina during the season. This indicates the widely separated areas from which nursery stock moves, and the importance of the inspection service. Some of these states are infested with insects not known to occur in South Carolina, and continued vigilance is necessary to keep them out.

**Sweet Potato Inspections.**—For a great many years the State Crop Pest Commission has required persons desiring to sell sweet potatoes for seed purposes or who expect to sell sweet potatoes for the purpose of producing plants for sale to have their fields inspected, the potatoes inspected in storage, and also the plant beds inspected, to be sure that
they are free from injurious pests and plant diseases. When these inspections were first inaugurated, black rot was a serious and destructive disease of this crop. At the present time, black rot is rarely found in the potatoes of any of the growers who have regularly received the required inspections and practiced the control measures recommended. Wilt, although occurring throughout the state, has been kept to a minimum. The sweet potato is now a very valuable crop in South Carolina, and everything possible should be done to keep the reputation which the state now enjoys in the production of good, clean potatoes. In the early years the South Carolina growers purchased most of their plants and seed from our neighboring states, but now the situation is reversed. This state still does not entirely meet the demand for plants, many of the growers preferring to sell seed stock rather than plants.

During the inspection period covered by this report, three inspections, field, storage, and plant bed, were given to 104 growers, one or more located in each of the following 24 counties: Abbeville, Aiken, Anderson, Bamberg, Barnwell, Calhoun, Clarendon, Colleton, Dorchester, Florence, Greenville, Georgetown, Hampton, Jasper, Laurens, Lee, Lexington, McCormick, Oconee, Orangeburg, Pickens, Saluda, Spartanburg, and York. The total acreage covered by the field inspection was approximately 755. Very unfavorable weather prevailed during the latter part of the growing season, resulting in excessive vine growth and causing the potatoes in some fields to sour and rot. Wilt was found in 21 fields during this inspection, but in no case did the infection exceed the tolerance allowed by the regulations. This tolerance is 10 hills per acre, for certified seed. All wilted hills in certified fields must be rouged under supervision of the inspector, in fact, the inspector does the rouging in the majority of the fields of certified growers.

An apparent virus disease, tentatively called "internal cork," has shown up in many of the potatoes grown in South Carolina and other states. This disease is of serious concern to the inspection service because its presence is not easily determined in the field and can be found in storage only by cutting the roots. Research is being done on this disease at the Edisto Experiment Station, and it is hoped that some definite recommendations for its control can be made soon. There is doubt in the minds of the plant quarantine officials whether potatoes so infected should be certified. Normally it occurs only as small, corky spots on the inside of the roots, but larger spots occur in some cases, and it is not known how serious the disease may become.

During the second, or storage, inspection, soft rot was found in 44 storage houses and banks. This is not unusual, but the disease caused serious damage to the potatoes of a few growers. Soft rot is not usually serious where proper handling and storage is practiced. Scurf was found
in two houses and surface rot in four. A few potatoes infected with charcoal and Java black rot were found in two of the houses. Neither of these diseases has ever affected any large quantity of the potatoes of any of the growers with whom we have come in contact.

During the plant bed inspection, black rot was found in three beds, only traces of the disease occurring in two cases. The third infection was found in the plant beds of a grower who had not previously had inspections. Help and advice will be given this grower during the coming season with the view of eliminating this disease.

South Carolina permit tags are required on all shipments certified by this Commission. During the season 14,160 tags were issued for this purpose.

**Seed Irish Potato Inspections.**—As required by law, the inspection of seed Irish potatoes coming into Charleston county was begun in early January and completed the first week in February. Seed potatoes were shipped by rail again this year, making it almost impossible to check every car that came into the county. The inspector did all he could under existing circumstances, checking every car that could be located. A total of 86 cars was inspected but four of these had been moved to the farms and complete records were not obtained. Records were obtained, however, for 82 cars. All potatoes inspected were in unusually good condition. There was very little cold injury and the common diseases, such as scab and rhizoctonia, seemed less prevalent than usual. The following diseases were found: Soft rot (probably induced by cold injury) in 4 cars, scab in 26, late blight in 4, stem-end discoloration in 2, rhizoctonia in 28, and necrosis in 1 car. Apparently a better grade of seed stock is being shipped to South Carolina, because it is in much better condition than seed received at the beginning of this service. It is believed that the improvement in the quality of the seed stock can be attributed largely to the fact there is an inspector at this end of the line.

The shipments received this year were as follows: From Canada 17 cars, Maine 45 cars, Michigan 11 cars, Minnesota 7 cars, and North Dakota 2 cars. It is interesting to note that there were only four cars of non-certified seed inspected out of the total of 82. Probably other non-certified seed entered the county, but it is known that such seed is less than in previous years. This year (1946) was the first time that any growers called the inspectors to their farms to make inspections.

**Apiary Inspection.**—Since March 1922, this law requires that all apiaries from which queen bees or package bees are sold be inspected every 60 days during the shipping season, in order that diseases of the honeybee may not be spread to other states or to other areas in South
Carolina. It was estimated in 1945 that there were 66,000 colonies of bees in South Carolina. A conservative value of the bees and hives alone is around $500,000.00. The honey produced in 1945 was valued at $223,000.00. Beeswax production for the year was estimated to be 18,000 pounds, valued at $7,000.00. These figures do not include the value of these bees as pollinators of the various farm crops which could hardly be estimated in dollars and cents. The above figures are given to show the value of one industry the Crop Pest Commission is trying to protect. All states have similar regulations and the inspection work is necessary if our beekeepers are to enjoy the advantages of inter-state business. The beekeeping industry is in its infancy in South Carolina, and there are possibilities for great expansion.

Five thousand colonies of bees, located in 19 counties, were inspected during the year. The number of diseased colonies found is shown in the following table:

<table>
<thead>
<tr>
<th>County</th>
<th>Premises inspected</th>
<th>Premises American Colonies</th>
<th>Premises European Foulbrood</th>
<th>Sacbrood</th>
<th>Nosema</th>
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<tr>
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<td>1</td>
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<td>0</td>
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</tr>
</tbody>
</table>

121 5,006 109 72 76 2

Fifteen hundred permits were issued for the shipment of queen bees and 1500 for the shipment of package bees.
Cotton Seed Regulations.—For a number of years it has been required that cotton seed transported or sold within the state for planting have attached to every consignment a permit of the South Carolina Crop Pest Commission. Actual inspection is not made of the cotton fields, except for those growers who ship to states requiring inspection. It has been felt that inspection of the fields of all growers selling seed would be impossible. In lieu of actual inspection, the Commission has required these growers to execute affidavits stating that in the case of staple cotton, less than 5 percent, and in the case of short staple cotton, less than 1 percent of the bolls in the fields of cotton from which the seed were taken showed evidence of the presence of antracnose and also that the fields, except where wilt-resistant varieties were grown, were free from wilt.

There were issued last year 54,110 permit tags for the shipment of cotton seed for planting.

Cabbage and Tomato Regulation.—Each year thousands of cabbage and tomato plants in small beds are inspected for growers who request permits to ship them. Last year there were issued 358 tomato permits and 400 cabbage permits.

Insecticide and Fungicide Regulations.—Manufacturers of insecticides and fungicides are required to file specifications and register the materials sold in the state. Funds, personnel, and facilities are not available for the sampling and analysis of the various materials. However, the manufacture of insecticides and fungicides in recent years has developed to the point where very little difficulty is encountered if the materials are used according to directions.

Inspections for Phony Peach Disease.—This is a cooperative project with the Bureau of Entomology and Plant Quarantine and has been carried on each summer since 1936. Phony peach is a serious virus disease of the peach, causing dwarfing of the trees and fruit, and long before the disease was recognized had caused serious damage in states where it occurred. The peach orchards in South Carolina fortunately were not heavily infected when inspections were begun in 1936, and the efforts of the Commission have been directed toward complete eradication. It is felt that progress has been made, even though about the same number of diseased trees are found and removed each year. Some new infections occur from year to year, while in other previously infected properties, the disease apparently is entirely eliminated. It is a fact that, if these control measures had not been inaugurated in South Carolina, the disease would have been much worse than it is today. Unfortunately, it is not yet known how the virus is transmitted from one tree to another, and
until this is known, the only means of control is to destroy the diseased trees. It may seem that the research agencies are slow in getting definite information regarding this disease, but in view of the difficulty the medical profession has in dealing with certain viruses like infantile paralysis, it can readily be understood that quick progress cannot always be made. Until such time, therefore, as the method of dissemination is determined, it behooves the infected states to continue the inspection and eradication. South Carolina is one of the most important peach areas in the southeast, and ample funds should be provided for the protection of the industry. The federal government each year expends three or four times as much money as the state in the control of phony peach disease.

Inspection work for the past several years has been confined to the previously infected commercial orchards and their environs in the counties of Edgefield, Greenville, Greenwood, Laurens, Saluda, and Spartanburg. These are the only counties now in the infected area, but more thorough coverage should be given the state again, and it is hoped that this can be done next year. More attention should be given home orchards, not only in the commercial area but in other counties of the state also.

For the entire state 1,611,736 trees were inspected, and 212 were found to be infected. These infected trees were removed by the end of the inspection period. In 1944, there were 211 phony trees found out of 2,804,782 trees inspected. For the last two years, 1944 and 1945, 53 percent of the infected properties and 25 percent of the infected trees have been on newly infected properties. Many of these newly infected properties are located from one to four miles from any other infected trees.

Rosette seems to be on the increase in certain sections of the Spartanburg area. The disease has been serious in at least one orchard. While rosette is not a subject of quarantine, the growers have been advised to remove these trees also.

Four trees infected with yellows were found in one orchard.

Japanese Beetle.—The Bureau of Entomology and Plant Quarantine in cooperation with the State Crop Pest Commission carried on considerable trapping in various cities and towns of the state again this year. These traps are set in order that any infestations of the Japanese beetle in areas outside the generally infested districts may be found and proper control measures administered before the insect becomes firmly established. As has been stated in previous reports, infestations of this insect of sufficient importance to warrant eradicative measures have occurred at several different times. In each instance, the control measures applied, have been successful. The introduction of this destructive pest in ad-
vance of its natural spread has thereby been delayed many years. The money saved by the eradication of these outlying infestations is far in excess of that spent for the control work.

A total of 125 traps was set this year in South Carolina, located in the following cities: Bishopville 25, Charleston Airport 25, Columbia 100, Columbia Airport 25, Clifton 25, Converse 25, Dillon 25, Florence 75, Fort Mill 25, Greenville 600, Greenville Airport 25, Greer 25, Hartsville 25, Lake City 25, Lancaster 25, Pickens 25, Spartanburg Airport 25, Summerville 25, Sumter 25, Walhalla 25, Williamston 25, and Woodruff 25. Only 13 beetles were caught in the state at the following locations: Charleston Airport 1, Greenville 6, Greenville Army Airbase 6. This is fewer beetles than were captured in Greenville last year and control measures will probably not be necessary next year.

The State Crop Pest Commission employed two trap tenders in the Greenville area for the period of June 1, to July 11. All trapping activities were discontinued on July 15. The nearest areas continually infested are several counties in Virginia.

**White-fringed Beetle.**—This is another destructive crop pest of foreign origin, being first discovered in this country, in some of the Gulf states, in 1936. Since that time infestations have been found as far north as North Carolina. Repeated inspections failed to reveal the presence of this insect in South Carolina until July of this year when a small infestation was found on the heeling-in grounds of a nursery dealer at Columbia. The beetles evidently came in around the balls of earth on infested nursery stock from Georgia. The beetles were also found in a couple of nurseries in Georgia late this season. Stock from these nurseries has been pretty widely distributed. Tracing and inspection of all such shipments is now underway. Inspection records for this season are incomplete, so the results of the season’s work will be reported later. The Commission has cooperated with the federal inspectors and will continue to do so throughout the season. When the work is complete, proper quarantine and control measures will be employed.

**Pink Boll Worm.**—There have been no new developments in the spread of the pink boll worm during the past year. It is still a subject of federal quarantine, therefore the South Carolina State Crop Pest Commission does not have any special regulations concerning this insect. Infestation by this insect in the United States, is confined to the southwest, but could easily spread eastward over the cotton belt if strict quarantine measures were not enforced.
European Corn Borer.—The European corn borer, a destructive insect pest of corn has continued to spread, mostly northward and westward, since it was first found in the United States in 1917. There has been a slow spread southward. Although the states in which it does not occur maintain regulations governing the movement of products likely to carry infestations, these are of no avail against the natural spread of the insect, so it is possible that as an insect comes nearer the border of the state, infestations within the state may occur.

Personnel.—On October 1, 1945, M. B. Stevenson, who had been with the Commission for 15 years as assistant state pathologist, resigned to accept a position with the Extension Service. He has been temporarily replaced by G. M. Anderson, who has had wide and varied experience in entomological work since his graduation from Clemson in 1913. John A. Cumalander, Fred A. Crawford, E. P. Edge, Bruce Lockaby, and John S. Reeves were employed as temporary phony peach inspectors during the month of June 1946.

The necessity for employing temporary inspectors will become increasingly necessary as other insects or diseases occur in South Carolina. The Federal Government probably will not continue to furnish men and funds for inspection activities as liberally as in the past. Consequently, the state should appropriate sufficient funds to finance the greater portion of this inspection service, which is in the interest of the agriculture of the state.
Dear Dr. Poole:

I submit below a report of some of the investigations carried on by the South Carolina Experiment Station. Only brief statements regarding the various projects are given since most of them are reported in detail in the Annual Report of the Station. Copies of the latter are available upon request.

Yours very truly,

H. P. Cooper, Director

NEW DEVELOPMENTS IN AGRICULTURE

For the past four or five years the work of the experiment station has been greatly retarded because of the absence of staff members on leave with the armed forces, the labor shortage, and the difficulty of obtaining needed supplies and equipment. In spite of these handicaps, much work has been done, and data on many of the farm problems of the state have been accumulated. Much of this work was necessarily done on projects which were started earlier and which must continue for a number of years in order to furnish reliable information. However, some new investigations were initiated and these are emphasized in the statements which follow.

With the return of staff members following the close of the war and the creation of some new positions with well trained men filling them, a new spirit pervades the staff and new impetus has been given to the research program which promises more rapid progress in the future.

Personnel Changes

During the war a number of men on the experiment station staff entered the armed forces. Most of these have either returned to duty
or have resigned to accept employment elsewhere. In addition, a number of new research workers have been appointed and a few staff members have resigned.

During the past year the following have returned to duty after service in the army or navy: W. T. Ferrier, agricultural economist; G. H. Dunkelberg, associate agricultural engineer; W. H. Garman, associate soil scientist; O. B. Garrison, associate horticulturist; J. G. Watts, associate entomologist, and Ernest Riley, assistant agricultural economist. New appointments include M. B. Hughes, associate horticulturist; Alfred Manwiller, associate plant breeder; W. M. Epps, associate plant pathologist; T. M. Clyburn, associate animal husbandman; N. B. Goebel, associate forester; R. H. Garrison, seed certification specialist; E. B. Eskew, W. N. Henderson, Jr., and W. A. Mappus, assistant agronomists; G. M. Barnett, J. T. Lazar, Jr., and Y. G. Lewis, assistant dairymen; and H. J. Sefick, assistant horticulturist. J. K. Park, agricultural engineer, and R. E. McDowell, agent in dairying, were appointed by the U. S. Department of Agriculture for service with the South Carolina Experiment Station.

Resignations of the following were accepted: C. N. Clayton, associate plant pathologist; J. M. Jenkins, associate horticulturist; I. A. Spaulding, associate rural sociologist; J. D. Kinard, assistant agricultural economist; and H. A. Johnson, assistant dairymen. S. L. Cathcart, agent in dairying, USDA, was transferred to another state.

Mechanization of Farming Operations Saves Labor and Reduces Costs

Much interest has been shown the last three or four years in the use of farm machinery to offset the labor shortage and reduce the cost of production of farm crops. If the full potentialities of farm mechanization should materialize, the effects upon the agriculture of South Carolina would be tremendous, and social conditions in the state would be vitally affected.

In the mechanization of farming operations, chief consideration naturally is given to the production and harvesting of cotton. To answer the many questions which are being asked concerning the handling of the cotton crop with machinery, the experiment station at its Edisto Station branch is this year (1946) producing and expects to harvest 100 acres of cotton with the labor of one man. In thus completely mechanizing cotton production, the following equipment was used: two-row tractor-mounted fertilizer distributor and planter, two-row tractor-drawn chopper, rotary hoe, two-row tractor-mounted cultivator, flame cultivator, and mechanical picker. Records are kept of the cost and other details of all operations, and the results will be published at the end of the season. One indication of the economy of mechanized operations is the fact that flame cultivation (as a substitute for hand-hoeing) has been done at a cost of only 65 cents per acre for each of three flamings.
The mechanization of sweet potato production is also being investigated in cooperation with the United States Department of Agriculture. Experimental equipment for preparing beds in the field, for setting plants, and for cultivating and harvesting the crop are being developed and tested. Here, as in the case of cotton, efficient mechanization should enable the crop to be grown with less labor and at lower cost.

At Clemson, during the current year, the use of a field ensilage cutter has greatly facilitated the harvesting and ensiling of corn. Labor requirements were reduced by almost three-fourths and the making of silage was speeded up considerably.

Irrigation Will Increase Yields and Improve Quality

During the last few years much interest has developed in the possibilities of irrigation for supplementing rainfall during dry weather. Experiments to determine the value of irrigation for corn and pastures are being conducted at Clemson, and work on irrigating vegetable crops is being done at the Truck Station at Charleston.

With the help of Agricultural engineers many practical ponds have been built for the dual purpose of producing fish and irrigating crops. Water diverted by gravity from a small stream into a prepared basin. Land about five acres below the pond is suitable for irrigation.
The accompanying photographs show the reservoir at Clemson and the method of applying water to corn through a portable sprinkler system. Where irrigation can be used, corn can be planted thickly and heavily fertilized for maximum yield. During 1946 when the rainfall was unusually well distributed, corn on irrigated plots at Clemson yielded at the rate of 34 tons of silage per acre, whereas non-irrigated plots produced 24 tons per acre.

Reservoirs for storing water for irrigation can be used as fish ponds. In many cases water for irrigation can be taken directly from streams, making the construction of reservoirs unnecessary.

Supplementing rainfall with irrigation improves the yield and quality of many vegetables and makes it possible to grow vegetables such as cauliflower, Brussels sprouts, and fall lettuce.

Pastures are the most economical source of feed for cattle, but adequate moisture is essential if there is to be rapid vegetative growth of high quality. In South Carolina pastures frequently suffer from dry weather and thus fail to provide satisfactory grazing. Creeks and branches are often adjacent to pasture areas, and water can be obtained from them at relatively low cost. To determine the economic feasibility of utilizing water from such sources for irrigating both perennial and annual pastures, an experiment has been started at Clemson, in which portable irrigation equipment is to be used.

**Plant Breeding Produces Better Varieties**

In the past the South has too often accepted the crop varieties bred in other sections of the country and adapted them as best as it could to local conditions. At present, however, much plant breeding is being done by Southern experiment stations, and gradually varieties better adapted to the South are being developed. Considerable work along this line is being done by the South Carolina Experiment Station.

In the case of cotton, the breeding of new varieties has been done so effectively by the commercial breeders that it has not seemed necessary for the experiment station to develop an extensive plant improvement program for this crop. However, comprehensive studies of the genetics of the cotton plant are being made at the Pee Dee Station in cooperation with the USDA. Recently the breeding of tobacco, South Carolina's second cash crop, has been started at the Pee Dee Station at Florence. Although no new varieties have yet been developed, progress is being made in producing strains resistant to root-knot, wilt, and other diseases, which are also high-yielding and of high quality.

With vegetable crops, breeding has been done over a longer period. Several years ago Clemson Spineless okra was developed by the experiment station and has largely superseded other varieties not only in South Carolina but wherever okra is grown.
A new variety of bean, Cherokee Wax, bred by the Truck Station has been released to growers. Very recently it was given an “All America” award in the trials of new vegetables conducted each year by the American Seed Trade Association. An award received in this trial is a much coveted recognition.

Other vegetables included in the present breeding program are sweet potatoes, of which 1200 seedlings are under observation; cucumbers, cantaloupes, peppers, (discussed elsewhere), lettuce, okra, and tomatoes. The aim in all cases is to produce varieties or strains which are disease-resistant, high-yielding, and of high quality. While strains of several of these vegetables have already been developed, they are not quite ready for release to growers. A limited amount of breeding work is being carried on with grapes and blueberries at Clemson. Over 500 grape seedlings are being grown at present to determine their adaptability, quality, productiveness, and resistance to disease. A few of the 120 seedlings which fruited in 1946 show some promise.

About 450 seedlings of the rabbiteye blueberry, a species native to certain localities in the South, are being grown. Less than half of these have fruited, but several have been selected for more thorough testing on the basis of their vigor, productiveness, and desirable fruit characteristics. The blueberry is a popular fruit and, if varieties having high quality and productivity can be developed, it will be widely planted.

In connection with the plant breeding work, the testing of new varieties developed by other breeders often reveals types of value to
South Carolina farmers. A variety recently brought to attention in this way is the new Dixie Wonder variety of Austrian winter peas. This variety when planted in November makes its growth during the winter and produces a cover crop ready for turning under much ahead of the ordinary type of Austrian winter peas. If allowed to mature, it produces a heavy crop of seed.

Eleven men doing more efficiently work formerly done by forty men. Cutting and storing silage with improved machinery.

In the truck-growing area three new varieties of potatoes, Pontiac, Kathadin, and Sebago, the superiority of which was shown by tests at the Truck Station, are replacing older and less satisfactory varieties.

The growth of the peach industry in South Carolina has emphasized the importance of good varieties. Elberta was formerly the chief variety produced, but many good peaches have been developed in recent years which greatly extend the Elberta harvest period or excel the Elberta in quality. For example, tests by the experiment station have demonstrated the desirability of such new varieties as Dixiegem, Dixired, Redhaven, and Halehaven, and commercial plantings of these have been or will be made. The first two varieties named are of particular interest since they are early, yellow-fleshed, freestone types much superior to other early varieties. Many other new peaches are under observation and some of these will doubtless be planted in the orchards of the state as their value is recognized.

The Pee Dee Station annually conducts a comprehensive test of cotton varieties and publishes the results for the benefit of growers and breeders. Variety tests of corn and small grains are conducted at the
Pee Dee Station and at Clemson, and the results of these tests are also published each year.

A corn-breeding program is being initiated at the Pee Dee Station. This work has been delayed because of inability during the war years to employ the necessary personnel. Particular attention will be given to the development of hybrid corn varieties adapted to South Carolina.

**New Ideas in Cultural Practices**

Present and prospective shortages of commercial fertilizer emphasize the importance of conserving animal manures which when available constitute a valuable supplement in the fertilization program. At the Pee Dee Station cotton fertilized with two tons per acre of stable manure has produced over a period of several years a yield of 1692 pounds of
seed cotton per acre, which is slightly more than the yield obtained from 425 pounds per acre of a 5-10-5 mixture. When the manure was used in combination with the commercial fertilizer at rates of 1, 3, and 5 tons per acre, the yield of cotton was 1845, 2021, and 2030 pounds per acre respectively.

Improved equipment for building excellent sweet potato beds. Note marker for accurate spacing of beds.

Yields of corn in South Carolina are on the average lower than they should be, chiefly because of dry weather at critical stages in the growth of the crop. The experiment station has found that yields can be doubled or trebled in favorable seasons by closer planting and the application of larger quantities of nitrogen. Tests to obtain data as to the effects of closer planting and larger applications of nitrogen with different varieties are now under way with cooperating farmers in the Orangeburg, Sumter, and Williston areas.

Recent experiments in tobacco and sweet potato plant bed management at the Pee Dee and Edisto stations have shown the importance of proper
preparation, fertilization, weed control, and other practices. In the case of tobacco, cover crops should be grown where the beds are to be made to provide good physical conditions in the soil. Proper and adequate fertilization should be given, and planting should be done early. Weeds, diseases, and insects are best controlled by the use of chemicals.

Adaption of conventional type of sweet potato transplanter to tractor. Transplanting mechanism is attached to hydraulic lift.

Sweet potato beds should be well drained and consist of a rather coarse bedding soil fertilized with 3 to 6 ounces per square yard of a good fertilizer, such as a 5-10-5 mixture. Small and medium-sized sweet potatoes treated with the recommended borax solution should be bedded. Strings and jumbos are not satisfactory. After the second pulling of sprouts has been made, fertilizer at the same rate should be applied as a top-dressing. A 12x50-foot bed at the Edisto Station, in which these practices were followed and in which 60 bushels of sweet potatoes were bedded, produced at the first pulling (in April) more than 75,000 plants. Plant production continued during April and May.

When vine cuttings are used to grow sweet potatoes, the starting of the cuttings when field conditions are unfavorable is often unsatisfactory.
It has been found that vine cuttings will form roots and become established more quickly if they are dipped in a weak solution of indole acetic acid prior to planting. This chemical is obtainable at drug and seed stores. It toughens the vines and helps to keep them from wilting. Treated cuttings have consistently given better stands and larger yields. Note accompanying photograph showing effect of treating cuttings.

Recent experiments in the curing of tobacco at the Pee Dee Station have shown that forced circulation of air in the barn results in a shorter curing time and more uniform curing of the tobacco in all parts of the barn. Control of the draft in the stack showed a reduced loss of heat and resulted in fuel economy. Butane gas as a source of heat for curing tobacco resulted in excellent curing but cost more than coal.

New farm machinery designed to bale more efficiently South Carolina's large hay crop.

Controlling Weeds with Chemicals

The control of weeds with chemicals has received much attention recently, and many weed killers are now on the market. For several years weeds in tobacco beds have been controlled through the use of cyanamid which is applied some time in advance of planting so that its toxic effects will have been dissipated before the tobacco seed are sown. Most materials for destroying weeds are applied in the form of sprays to growing plants and through selective action destroy those not wanted. Experiments with some of these selective weed killers are being carried on, but results are not yet available. However, the selective effect of a material known as G-652 (containing 2, 4-D) may be seen in the accompanying illustration. Honeysuckle was killed completely, whereas Dallis grass growing among the honeysuckle vines was not injured.
Sweet potato cuttings are made to root well in experimental studies. A five days' test shows sparc roots on stems not treated and heavy roots on those treated with a root-promoting hormone (indole-acetic acid) before transplanting.

DDT and Other New Materials for Controlling Insects and Diseases

Many new materials are being developed for combatting insect and disease pests and a number of these are undergoing tests by the experiment station. Among these materials DDT has perhaps received more publicity than the others. Tests, on a considerable scale, of the use of DDT against the common fly in dairy barns at Clemson and near Columbia were quite successful, and the beneficial effects of the spray treatment were in evidence for several months.

Stable, horn, and house flies, prevalent on beef cattle at the Coast Station were controlled for two to four weeks following each application of DDT in the form of a fine mist (spray). Different concentrations and methods of applications of DDT were used but apparently the most promising was the application to the saddle portion of the back of the animal, using less than .03 of a gallon of material containing 2 1/2 percent DDT. Apparently four to six applications during the season will be needed. Horse flies do not seem to be affected by the chemical. To determine whether the animals might be adversely affected by DDT, one calf has

been thoroughly wet daily with a spray containing 5 to 10 percent of the chemical, thus receiving many times the quantity necessary for control of the flies. After 26 applications the calf showed no ill effects. Additional applications are being made to determine whether they will have any toxic effect.

At Clemson, four applications of a spray mixture containing one pound of DDT per 100 gallons completely controlled the codling moth and oriental fruit moth on apples. In the Piedmont the control of these pests on apples has been very unsatisfactory when ordinary spray materials have been used. A high percentage of the fruit was infested with the insects or bore “stings” which reduced their market value. Fruit from trees sprayed with DDT had only one percent of infested fruit.

DDT has also been successfully used at Clemson against the leaf hopper on grapes, the vines and fruit of which are often damaged by this pest.
At the Edisto Station this insecticide has proven effective against the tomato fruit worm and apparently is effective against the pickle worm found on melons and cucumbers, although there is some question as to its effect upon melon and cucumber plants. It was not as effective as arsenate of lead against the bugworm, an insect attacking ornamental plants. At the same station, a material known as Sabadilla was quite satisfactory for controlling squash bugs.

The Pee Dee Station found DDT an effective remedy for tobacco budworms, a serious pest of this crop. The material kills not only the budworms on the plants at the time of application but also controls new infestations appearing several days later.

Cutting into a diseased turkey to determine cause and remedy. This service has been greatly enlarged due to increased turkey growing in the state.

Also at the Pee Dee Station a material known as D-D was found to control the larvae of June beetles which damage plants in tobacco plant beds. This material can be applied in the fall and is quite effective. Another material that will control this pest is the ordinary gasoline.

At Clemson, D-D was applied to tomato plots in an effort to control nematodes. Application was by a simple drip method using a garden planter fitted with a tank, hose, and valve which applied the proper amount of D-D as the planter was drawn over a previously opened furrow at a regulated speed. Immediately following application of the D-D
a bed was made over the furrow, and three weeks later the tomatoes were set out in these rows. Examination 30 days after planting revealed few or no nematode galls in treated rows as compared with numerous galls on comparable plants grown in untreated soil. On September 1, plants on treated plots were still producing well, whereas many of those on untreated soil were dead. If further tests of this material to be made with tobacco prove effective in controlling nematodes on that crop, it will be of much value since nematodes are a serious pest in tobacco production. One point which must be investigated in the use of D-D on tobacco soils is what effect, if any, the chlorine in the D-D may have upon the quality of the tobacco.

At the Pee Dee Station, benzine hexachloride was found to control boll weevils better than straight calcium arsenate and in addition it completely killed all cotton lice. If further experiments confirm the preliminary results this material will probably replace calcium arsenate for boll weevil control and at the same time serve as a control for cotton lice. This will be a great boon to farmers since many of them hesitate to use calcium arsenate because of its unfavorable effect on the soil.

Tests of two new materials for the control of plant diseases have proceeded far enough to yield definite results. These are zinc trichlorophenate and ethylmercury p-toluene sulfonanilide used in controlling seed-borne diseases of cotton. The first named material is much less poisonous than previously used mercury compounds, and the oil extracted from treated cotton seed may be used without danger. Apparently, treated seed are not very toxic to animals, and if fed to them accidently would probably not affect them seriously. The second material is quite poisonous but otherwise less objectionable to use (it has no disagreeable odor) than chemicals heretofore employed in treating seed. This may prove to be a disadvantage since there is nothing to warn users against its highly poisonous character. Still other materials are being developed for seed treatment and some of these may prove superior to the ones just discussed. One of these is nonpoisonous, causes no irritation of the nose and throat such as occurs when zinc trichlorophenate is used, and is apparently satisfactory in other respects.

"Internal Cork" and "Internal Breakdown" of Sweet Potatoes

Sweet potatoes throughout the South are threatened with a serious new disease known as "internal cork" discovered and described by Dr. C. J. Nusbaum at the Edisto Station. Since its discovery in this state, it has been found in most of the other southern states. Should it become more general, it would vitally affect the market quality of sweet potatoes. Its origin and the extent of its distribution are not yet known, but considerable effort is being expended in determining its symptoms, method of infection and possible control measures.
Another sweet potato problem is the development of internal breakdown in sweet potatoes when they are stored under certain conditions, and which reduces their value for market. It was found that when sweet potatoes which had been in storage for two or three months were exposed to temperatures of 32 degrees to 45 degrees F. for periods of time varying from 12 hours to three weeks, internal breakdown occurred in 4 to 12 weeks after the exposure. No breakdown occurred in sweet potatoes exposed to temperatures up to 75 degrees F. for 21 days. These results emphasize the desirability of maintaining sweet potato storage temperatures above 45 degrees F. Internal breakdown cannot be determined from the external appearance of the sweet potatoes which may seem to be in good condition.

Simple, Effective Treatment to Preserve Fence Posts

Nearly six years of experimental work in the nonpressure preservative treatment of Southern pine fence posts has shown that the useful life of the posts may be materially increased by treating with copper sulphate or zinc chloride. In a test plot established in 1940, all of the untreated check posts have failed, while over 95 percent of the treated posts are still in excellent condition. The corrosive effect of copper sulphate on fence wire is so severe that it is not recommended. Zinc chloride, however, is recommended as a desirable chemical for treating pine posts, since it is simple to use, economical (requiring only 5 to 15 cents worth of salt per post), effective in prolonging useful life, not seriously corrosive to contacting fencing materials, and imparts some fire-resistance to the posts.

Progress of Projects Supported by Special Appropriations

Within the last few years the general assembly has made special appropriations for three lines of work on which progress reports can be made at this time.

The first of these to be authorized was the horticultural products research laboratory established primarily for investigations into the feasibility of canning freestone peaches. This was considered important because of the possibility that the age of the orchards, the weather and economic conditions might combine to cause an over-production of market peaches in South Carolina. The success achieved in canning peaches at the laboratory is attested by the very favorable impression the product has made upon all those who have seen and sampled it, including experts connected with the canning industry. As a result of the research, the laboratory has demonstrated beyond a doubt that a high-quality canned product can be processed from South Carolina-grown fruit. It only remains for the canneries in the state to adopt proven practices and thereby obtain a favored place in the canned goods market. Unfortunately the
great demand for canned peaches has tempted some canners to process an inferior product, which it is feared will eventually react against the industry in the state.

In addition to the research on the canning of peaches, much other work has been done, including experiments in dehydrating vegetables, canning vegetables, pickling, preserving, and quick-freezing, using various methods of preparation and pre-freezing treatment. One interesting phase of this work has been the testing of many new varieties of peaches to determine which do not develop undesirable flavors or turn dark when frozen. The results of some of the work on quick-freezing have been published in Circular 71 of the experiment station.

Another project to be authorized was that of "research in special and drug crops." Most of the work to date under this item has consisted of pepper breeding, and research on Turkish tobacco now being produced by a number of farmers in Oconee, Pickens, Greenville, and Anderson counties.

The aim in the pepper-breeding work has been to develop better strains of hot peppers of the type grown in the Florence area. The variety commonly grown in that section had become badly mixed and of low pungency before this work was started. Much progress has been made, and a number of promising new strains are now being tested both by farmers and in experimental plots. However, considerable work remains to be done in determining which if any of the new types are best for the Florence area. Additional hybridization and selection may be necessary to obtain an ideal strain.

In the pepper-breeding work, efforts have been directed toward the development of strains with uniform plants and pods, high pungency, high yield, and disease resistance. Other factors which have received attention are behavior of peppers when cured and retention of color and pungency after grinding.

The work on Turkish tobacco has been carried on in cooperation with Duke University and has been done to determine the feasibility of producing this type of tobacco in the Piedmont area. During the war the usual supply of this type of tobacco imported from the Near East (75,000,000 pounds annually) was cut off. This resulted in efforts to try to grow Turkish tobacco here. The research has consisted of plant-bed studies, comparison of varieties, cultural, curing, grading, and packing methods. Although a great deal of hand labor is involved in producing Turkish tobacco, returns per acre are high, and a considerable number of farmers are becoming interested in the crop.

Besides the research on peppers and Turkish tobacco, some experiments are being conducted with sesame, or benne. This plant holds some
promise as a source of oil and meal, and a few farmers are growing small plantings on a trial basis. A number of varieties and strains are being tested and selections from some of these have been made. A local cotton oil mill is interested in obtaining a quantity of seed for processing.

A third project under this heading is the research work with turkeys. Studies have been made of the cost of production and comparative value of the small-type white broad breasted turkey vs. the large broad breasted bronze type. Breeding has also been under way to improve egg production and hatchability and to reduce broodiness. On the basis of the work at Clemson, turkey growers have been advised that selection of birds with these characteristics in mind will result in larger numbers of hatching eggs and poults and a cost of production one-third less than when unselected stock is used.

Studies of diseases of turkeys have included pullorum disease, trichomoniasis, colds, and other respiratory infections, and methods of controlling them.

**Artificial Insemination of Dairy Cattle Makes Rapid Progress**

As a result of studies at Clemson and the encouragement and cooperation of the research staff, much progress is being made in the utili-
zation of this method of breeding in South Carolina. Already farmer cooperatives in Greenville and Spartanburg counties have employed technicians and are operating full-time. Bulls in the Clemson College dairy herd are utilized as sires in this program, the cooperatives purchasing the semen, which is delivered twice weekly.

The technical details of the program have been developed by the experiment station and must be under careful control at all stages. Facilities for further research have been provided by the construction of a laboratory and adjacent bull barns. Training of technicians for artificial breeding work will be provided through short courses.

Sweet Potatoes for Fattening Swine

Sweet potatoes in different forms are being fed to fattening swine at Clemson to determine their value in comparison with corn. So far the animals fed raw potatoes have made much slower and more expensive gains than those on corn. When the potatoes were cooked before feeding, the hogs gained weight twice as fast as did those on raw potatoes and only a little more than half the quantity of potatoes was needed per 100 pounds of gain. The gains made when dehydrated sweet potatoes were fed were slower and more expensive than those made by corn-fed animals, assuming the dehydrated product to be approximately equivalent in money value to corn. However, if dehydrated potatoes which had been blanched before drying were fed, the animals made the same gains as those receiving corn and consumed slightly more feed than the corn-fed hogs. The blanched dehydrated sweet potatoes were 94 percent as efficient as corn. Chemical analyses indicate that the superiority of the cooked potatoes and the blanched dehydrated product is probably due to a breaking down of the starch into simple sugars which are more readily assimilated by the animals.

Marketing of Tree-Ripened Peaches Increases Consumption

The consumption of peaches can be doubled or perhaps trebled, and the product marketed at higher prices, if tree-ripened fruit is delivered to the consumer in good condition. This conclusion seems justified in the light of experiments in which fairly large-scale shipments of tree-ripened peaches were shipped from Spartanburg county to northern markets. In this experiment fruit which would be classified at the packing house as “soft-ripe” was successfully delivered to markets 550 to 600 miles distant, and they outsold “hard-ripe” fruit even when a considerably higher price was charged.

Tree-ripened fruit must be handled in consumer-size packages, holding 4 to 8 quarts, and these must be packed in a larger container carry-
Comparing samples of frozen peaches at the Horticultural Products Research Laboratory. Information being obtained will be of much practical value in quick freezing procedures.

Handling about 10 of the smaller units. These must be precooled and shipped by motor truck or refrigerated rail transport. Careful handling should be the rule at all stages in the marketing of such fruit.

The shipments of fruit in this experiment were made cooperatively by the South Carolina and Ohio Experiment stations, the South Carolina Extension Service, and the South Carolina Peach Growers' Association.

Survey Shows Importance of Different Soils for Sweet Potatoes

An economic survey of sweet potato production in South Carolina recently made by the experiment station reveals, among other facts, that the best soils for this crop are Norfolk sandy loam and the sandy loams of the Norfolk, Ruston, and Marlboro series. These are classed as "excellent" sweet potato soils. Ranking next, with the classification of "good", are Cecil sandy loam and Appling fine sandy loam. Norfolk loamy sand is only "fair" for sweet potatoes. Usual yields are 220 bushels per acre on "excellent" soils, 200 bushels on "good", and 170 bushels on "fair" soils.
The survey included studies of fertilizer practices, labor requirements, cost of production and the place of sweet potato growing in the farm organization. Details of the survey have been published in Bulletin No. 364 of the experiment station.

Rural Housing Survey Indicates Need for Help in Planning Improvements

A survey has been made by the experiment station of 105 farm homes whose owners have made improvements in their homes since January 1, 1938. Of the number surveyed, the owners of 29 built new homes, 28 made major improvements, and 48 remodeled and modernized for greater convenience. More than half of the owners refinished the interiors of their homes and a similar number installed electric lights. From 23 to 43 of the owners provided closets, brought water to the house, added, enlarged or screened porches, cut new doors and windows, built additional rooms or installed sinks. Twenty owners installed bath rooms. In spite of the latter, however, most of the homes are still without bathrooms. The study revealed that one of the most pressing needs is for help in planning new homes or remodelling old ones so that frequent mistakes which limit the convenience and pleasure of the improvements can be avoided. One encouraging fact was that only 15 percent of the improvements were made on credit.

Promotion of Social Study Among South Carolina Women

Questionnaires and suggested study outlines have been prepared to encourage the women's organizations of the state to have their members familiarize themselves with the social, educational, economic, and civic affairs of South Carolina and the nation. In addition, lists of books, pamphlets, and other material have been furnished so those concerned will know the sources from which information on a given subject may be obtained. The demands for information of the kind indicated suggest that the women of the state are much more interested in public affairs and are becoming better informed regarding them.

Enrichment of Corn Meal and Grits

Under a grant from Research Corporation, an organization which fosters scientific activities, the experiment station has been assisting corn millers in complying with the South Carolina law requiring the enrichment of corn meal and grits. Feeders for incorporating the enriching ingredients into meal and grits as they are processed have been designed so that they may be attached to mills of different sizes and kinds. So far, 185 mills in the state have been equipped to enrich corn products. Improvements in the design of the feeders have been made as a result of the experience of the mills using them, and an educational campaign is
Many of the small corn mills in the state have installed the inexpensive feeders designed at Clemson for adding the enriching mixture that makes corn products of greater nutritive value.

being carried on to acquaint nurses, hospital staffs, millers, and others with the desirability, from the health standpoint, of using enriched meal and grits. Also analyses of enriched products from various mills are made, and, on the basis of the data obtained, measures are taken to reduce segregation of the enriching material in packages of meal and grits, and housewives are advised as to rinsing and other practices in preparing corn products for the table. Experience in connection with this project is of value in connection with the establishment of federal standards for the enrichment of corn products, similar to standards already established for wheat products.

New Research Projects

A number of the investigations reported herewith have been under way for only a year or two, but the results obtained to date are indicated because in most instances they are of special interest to certain groups.
There are a few new projects on which no data have yet been obtained, but which perhaps should be mentioned. They include pasture experiments, in which Bermuda, common lespedeza, Lespedeza sericea, kudzu, white Dutch clover, Dallis grass, and mixtures of these will be tested for grazing beef cattle; studies of irrigated pastures for dairy cattle; investigation of different methods of storing meat; a small experimental orchard at the Sandhill Station for studying possible deficiencies of plant nutrients and their effects on peach trees; studies of sweet potato propagation; the nutritional value of cowpeas for human consumption; experiments in the grazing of Lespedeza sericea and kudzu by dairy cows; a fertilizer, spacing, and variety test of corn, using closer spacing and more liberal fertilization with different varieties; study of fungicides for vegetable crop diseases; and the breeding of cowpeas for human food.
Dear Dr. Poole:

I have the honor to transmit herewith the summary report of the work of the Extension Service.

Respectfully submitted,

D. W. Watkins, Director

The Clemson College Extension Service is a branch of the Clemson Agricultural College, and is responsible for conducting with all the farm people of South Carolina the educational and demonstration program in agriculture and home economics of the College and the United States Department of Agriculture cooperating.

The headquarters of the Extension Service is at Clemson College. The home demonstration branch of the Service has headquarters at Winthrop College, and Negro Extension has headquarters at the State Negro College at Orangeburg.

The Director of the Extension Service at Clemson is in charge of, and is responsible to the President and the Board of Trustees of Clemson College for, all extension work conducted in South Carolina by Clemson College and the United States Department of Agriculture.

The Staff of Agricultural Extension Workers includes an assistant director, three district supervisory agents, a chief clerk, 46 county agents—one in each county, 33 assistant county agents, 37 farm labor assistants, and 50 agricultural specialists in agricultural economics and farm management, agricultural engineering, beekeeping, boys 4-H club work, crops insects and diseases, dairying, field crops, forestry, food improvement, fruit and truck crops, livestock, marketing, poultry, publications, rural electrification, soil conservation, and visual instruction.
The Extension Home Demonstration Staff includes a state home demonstration agent, an assistant state agent, three district supervisors, 46 county home demonstration agents—one in each county, 15 assistant county home demonstration agents, and eight home demonstration specialists in food production and conservation, clothing, girls' 4-H club work, home management, marketing, nutrition, and poultry.

The Staff of Negro Extension Workers includes a supervisory agent and an assistant supervisory agent for agricultural work, a supervisory agent for home demonstration work, 29 Negro agricultural agents, and 20 Negro home demonstration agents.

Extension Workers Returning from Military Service: Fifty-seven extension workers left the Service to serve in the armed forces during the war, 47 of whom were granted military leave. Included in the 57 workers who entered military service were one assistant to the director, 17 agricultural specialists, 15 county agents, 22 assistant county agents, one assistant county home demonstration agent, and one Negro agricultural agent.

Since the close of hostilities, 36 of these extension workers have returned to the Extension Service. Five of these 36 have subsequently resigned, leaving a net of 31 workers returned to extension work from military service. Of these 31 workers, one was placed as chief clerk and accountant, 10 as agricultural specialists, 11 as county agents, seven as assistant county agents, one as a county home demonstration agent, and one as a Negro agricultural agent.

During the war, as far as was possible, extension workers were employed on an acting basis to fill the places left vacant by those workers entering the armed services. Increased State and Federal appropriations for extension work for the fiscal year, 1946-1947, made it possible to retain the services of the best of these temporary workers who had accumulated from one to four years' experience in extension work during the war. Consequently, the Extension Service was fortunate in being able to expand its personnel with experienced, tried workers.

In any further increase in extension personnel, resulting from increased appropriations, emphasis will be placed on increasing the number of extension workers, particularly assistant county agents and assistant home demonstration agents in the counties of the state. The present plan for the future provides for placing one assistant county agent in each county having 2,000 farms, two assistant county agents in each county having 4,000 farms, and three assistant agents in each county having 6,000 farms.
South Carolina Farmers and the War Effort

The year 1945, the fourth war year, found South Carolina farmers working under increasing handicaps in their efforts to keep up their wartime level of production, conservation, and marketing of food, feed, and fiber.

It had become harder and harder for them to maintain the high level of production reached in their all-out effort to supply the farm products needed by the nation at war. Farm labor was at an all-time low ebb, both as to numbers and efficiency. Farm machinery and equipment had become increasingly scarce, and much of that in use on farms was old and worn. Transportation facilities were short of needs. And, in many cases, materials and facilities available could not be fully and efficiently used because of shortages of labor and equipment.

However, in spite of these hindrances, and the fact that the war ended during the year, the wartime level of production was generally maintained on South Carolina farms. The farm people of the state had kept their faith with the nation in its hour of need.

The following table, based upon records of the Bureau of Agricultural Economics, Crops Reporting Section, United States Department of Agriculture, shows the production of the main crops and livestock in South Carolina during the four war years, 1942-1945. It is interesting to note that in spite of the wartime handicaps under which farmers worked during this period, new high records for the state were established in the production of oats, wheat, tobacco, barley, peanuts, hay, sweet potatoes, cattle, milk cows, milk production, hogs, chickens, eggs, and turkeys.
### Table Showing 1945 Production of Principal Crops and Livestock in South Carolina, with Comparisons

<table>
<thead>
<tr>
<th>Product</th>
<th>1942</th>
<th>1943</th>
<th>1944</th>
<th>1945</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, bu.</td>
<td>21,330,000</td>
<td>24,720,000</td>
<td>24,160,000</td>
<td>23,414,000</td>
</tr>
<tr>
<td>Oats, bu.</td>
<td>13,461,000*</td>
<td>14,102,000*</td>
<td>15,064,000*</td>
<td>16,023,000*</td>
</tr>
<tr>
<td>Wheat, bu.</td>
<td>3,377,000*</td>
<td>2,864,000</td>
<td>3,653,000</td>
<td>2,912,000</td>
</tr>
<tr>
<td>Cotton, bales</td>
<td>699,000</td>
<td>695,000</td>
<td>864,000</td>
<td>675,000</td>
</tr>
<tr>
<td>Tobacco, lb.</td>
<td>96,750,000</td>
<td>87,400,000</td>
<td>128,800,000</td>
<td>139,520,000*</td>
</tr>
<tr>
<td>Barley, bu.</td>
<td>198,000*</td>
<td>185,000</td>
<td>195,000</td>
<td>166,000</td>
</tr>
<tr>
<td>Peanuts, tons</td>
<td>14,437*</td>
<td>18,700*</td>
<td>12,700</td>
<td>12,500</td>
</tr>
<tr>
<td>Hay, tons</td>
<td>550,000*</td>
<td>474,000</td>
<td>417,000</td>
<td>515,000</td>
</tr>
<tr>
<td>Syrup, gal.</td>
<td>700,000</td>
<td>1,231,000</td>
<td>1,120,000</td>
<td>1,080,000</td>
</tr>
<tr>
<td>Sweet-potatoes, bu.</td>
<td>5,890,000</td>
<td>7,221,000*</td>
<td>7,056,000</td>
<td>5,890,000</td>
</tr>
<tr>
<td>Irish potatoes, bu.</td>
<td>3,108,000*</td>
<td>3,193,000</td>
<td>1,464,000</td>
<td>2,480,000</td>
</tr>
<tr>
<td>All cattle on farms, No.</td>
<td>335,000</td>
<td>392,000*</td>
<td>400,000</td>
<td>392,000</td>
</tr>
<tr>
<td>Milk cows on farms, No.</td>
<td>181,000</td>
<td>186,000*</td>
<td>190,000*</td>
<td>186,000</td>
</tr>
<tr>
<td>Milk production, lb.</td>
<td>587,000,000*</td>
<td>589,000,000*</td>
<td>604,000,000*</td>
<td>600,000,000*</td>
</tr>
<tr>
<td>Hogs on farm, No.</td>
<td>672,000*</td>
<td>800,000*</td>
<td>704,000</td>
<td>641,000</td>
</tr>
<tr>
<td>Chickens on farms, No.</td>
<td>4,978,000*</td>
<td>5,756,000*</td>
<td>5,672,000</td>
<td>6,119,000*</td>
</tr>
<tr>
<td>Eggs produced, doz.</td>
<td>299,000,000*</td>
<td>328,000,000*</td>
<td>385,000,000*</td>
<td>384,000,000</td>
</tr>
<tr>
<td>Turkeys raised, No.</td>
<td>155,000</td>
<td>256,000*</td>
<td>307,000*</td>
<td>460,000*</td>
</tr>
</tbody>
</table>

*Highest Production on Record for South Carolina

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### The Extension Program of Work

The main objectives of the extension program are listed as follows:

1. Further development of a diversified and efficient system of farming in South Carolina that will (a) maintain and improve the soil; (b) supply the food and feed needs of the farm; and (c) provide the highest possible cash income for the farmers of the state.

2. The training of farmers to become expert in the production, standardization, and marketing of their products in order that they may produce efficiently, and be able to meet competition from other production areas.
3. The establishment and efficient operation of adequate marketing facilities for the products farmers produce for sale.

4. The training of farm boys and girls in agricultural and farm home knowledge and skills and in the principles of citizenship and clean healthful living.

5. The training of farm women in matters pertaining to the farm home.

6. The improvement of land tenure systems.

7. The conduct of the educational work necessary to acquaint farm people with the functions and programs of other governmental agencies created to help with specific problems.

8. The organization and training of voluntary farm and home leaders to cooperate in the development and conduct of this program.

The 1945 program of extension work was planned with the help of voluntary farm and home leaders, both on a statewide basis, and for each county. In the fall of 1945, the program was revised to meet the needs of the farm people of the state in the period of postwar adjustment. This revision consisted mainly of a change in emphasis from the emergency job of all-out production of the food, feed, and fiber needed by the nation at war, to efficient, low-cost production, grading, packing, and marketing of high quality farm products.

**Extension Activities and Results**

In carrying out the 1945 extension program of work, county agents, home demonstration agents and assistant agents made 99,412 farm and home visits to 58,847 different farms and homes. They prepared for publication 11,523 newspaper articles, distributed 201,241 bulletins, and other publications, and made 819 radio talks, giving timely farm and home information. They held 29,577 educational and demonstration meetings which were attended by 550,966 farm people. A total of 167,578 farm people called at county extension offices, and 149,470 called by telephone for information and assistance.

**Agricultural Economics and Farm Management** work included providing farmers, through meetings and publicity, with outlook and economic information to enable them to adjust their farming operations to changing conditions. Also the establishment of committees to assist veterans returning to farms, farm planning demonstrations, and a program to improve the farm tenancy system in the state.
The Farm Labor Program resulted in the placement of 102,515 farm laborers with 14,719 farmers, and the use of prisoners of war for 390,300 man days of farm work.

Agricultural Engineering work in the main part consisted of schools, demonstrations, and assistance to individual farmers in the operation, care, and repair of farm machinery and equipment. Assistance was given farmers in drainage, irrigation, soil and water conservation, and to cotton ginners in efficient operation of ginning equipment. Plans and assistance were given farmers in the construction, repair, and remodeling of farm buildings and equipment.

Field Crops, Fertilizers, and Soils work included demonstrations and assistance to farmers in improving yields and quality of field crops, the proper use of fertilizers, lime, and soil-building crops, the best use of land, permanent pasture improvement, and increasing the production of food and feed crops.

Soil Conservation work consisted of educational meetings and demonstrations to further the adoption of soil and water conservation practices by farmers.

Dairying extension work consisted of assistance to farmers in improving the quality of their breeding stock, feeding to efficiently produce milk, marketing dairy cattle and dairy products, and 4-H calf club work with farm boys and girls.

Insects and Disease work included assistance to farmers in preventing and controlling insects and disease damage to crops, and parasite control on livestock.

Forestry work included demonstrations and assistance to farmers in thinning timber stands for pulpwood, timber estimating, marketing farm timber and pulpwood, insect and disease control in farm woodlands, and reforestation of cut-over and idle lands.

Four-H Club Work. In all, 36,574 farm boys and girls were enrolled in 4-H club work. Training was given these boys and girls in judging leadership, wildlife conservation, citizenship, food conservation, clothing, poultry and livestock production, soil and water conservation, and other farm and home practices.

Fruits and Vegetable Crops work included help to farm people with home and commercial orchards, home gardens, truck crops, and sweet potato production.
Livestock extension work consisted of assistance to farmers in improving the quality of their beef cattle, swine, and sheep breeding stock, feeding and management practices, and help to 4-H club members in growing out and marketing their beef calves and pigs. Also demonstrations in killing, cutting, curing, canning, freezing, and otherwise processing farm animals for food.

Marketing work included assistance to farmers in selection of right varieties, production, assembling, grading, packing, and marketing of farm products.

Poultry work consisted of demonstrations of poultry and turkey flock management, disease and parasite control, feeding, housing, and assistance to poultrymen and hatcheries in improving poultry breeding stock.

Food Improvement work consisted of assistance to corn millers in enriching and improving the food value of homeground corn meal and grits which make up a large part of the diet of many poorer families of the state, and, also, a general educational program to improve the diets of the people of the state.

Information Material included the publication of bulletins, newspaper articles, and letters on timely farm and home information, and the broadcasting of such information over the radio stations in the state.

Visual Instruction work included the use of educational motion pictures, slides, filmstrips, photographs, models, and exhibits in the extension educational program.

Home Demonstration work consisted of demonstrations and assistance to the farm women of the state in food production, planning and preparation of balanced meals, canning, drying, curing and freezing foods, home marketing, home poultry flocks, home management and house furnishing, home marketing, girls' 4-H club work, clothing and textiles, health, and sanitation.

Negro Demonstration Work consisted of assistance to Negro farm families in the production and marketing of crops and livestock, in home food and feed production, home improvement, health, and nutrition.

New Lines of Work Under Way

Among the new lines of work being undertaken by the Extension Service to assist farmers in making postwar adjustments to meet the
rapid and revolutionary changes that are taking place in agriculture, are the following:

**Development of Complete Farm Planning Demonstrations:** This activity is being expanded to assist farmers in planning their farms as units for efficient production of crops and livestock, including (a) soil improvement and soil and water conservation; (b) best use of land; (c) efficient use of farm labor and machinery; (d) balance between crops and livestock; (e) production of food and feed needed on the farm; and (f) efficient production of quality products for market. Much interest is being shown by farmers in this type of complete farm planning.

**Assistance to Veterans Returning to the Farm:** County advisory committees of farmers have been set up in each county to provide information, advice, and assistance to returning veterans who wish to buy or rent farms, or find employment on farms.

**Landlord-Tenant Arrangements:** The increase in mechanization on South Carolina farms, and the addition of livestock production, such as beef cattle, dairying, hogs, poultry, and turkeys as additional sources of income on many farms has resulted in a need on the part of farmers for assistance in developing rental systems involving the production of livestock and the use of machinery on a share basis. Progress is being made in working out satisfactory systems.

**Selection, Operation, Care, and Repair of Farm Machinery:** The rapid growth of mechanization on South Carolina farms is resulting in increased demands upon the Extension Service for assistance to farmers in (a) the selection of power equipment and attachments suited to the needs of their individual farms; (b) training farmers, farm boys, and farm laborers to efficiently operate such machinery and equipment; and, (c) care and repair of such machinery and equipment.

**Drainage:** Much good land in the state, especially in the Coastal Plain, is now waterlogged from poor drainage, and can be brought into production of crops only through the installation of drainage systems. Considerable work is being done in developing a drainage program to meet this need.

**Irrigation:** Water at the right place at the right time may often mean the difference between good crop yields and crop failure. Demonstrations of irrigation practices are doing much to show farmers the practicability of irrigation, especially on crops having a high value and a high cost of production per acre.
Labor-Saving Equipment and Practices: The acute shortage of farm labor during and since the war has hampered farm production in the state. The Extension Service is conducting a program of schools and demonstrations to assist farmers in the selection and use of labor-saving equipment and practices to enable them to accomplish more work with less labor.

Dairy Herd Improvement Association Work: This program was discontinued during the war because of the scarcity of trained personnel. The reorganization of this work this fall will furnish extension workers and farmers with accurate information on all essential dairy farm practices, and will provide the main dairy farm demonstrations.

Artificial Insemination Program: This program is being developed in Spartanburg and Greenville counties on a demonstration basis and as it spreads over the state, will do much to spread the progeny of proved dairy sires and thus improve the milk production of dairy cows on farms.

Family Cows: In several sections of the state there is a serious shortage of family cows on farms. The Extension Service is assisting in obtaining cows and heifers from other parts of the state and from out of the state to relieve this shortage.

Cotton Insects and Diseases: A full-time specialist has been employed on cotton insects and diseases, and a greatly enlarged program of assistance to farmers is being developed along this line.

Use of New Insecticides: DDT, Sabadilla, and other new insecticides are revolutionary in their ability to enable farmers to control insect pests heretofore almost impossible to control. Demonstrations of the use of such insecticides are being conducted in every county of the state.

Five-Acre Pulpwood Thinning Contest: This contest is furnishing a splendid basis for teaching farmers good forestry practices, especially in thinning timber stands to obtain pulpwood for market.

Tree Farms Program: County agents will serve on county boards which will make recommendations to the State Tree Farms Committee for certification of farmers who have qualified. Appropriate ceremonies will be held for those farmers certified. Conducted in cooperation with the State Commission of Forestry.

Food Improvement: Corn meal and grits when used to supply a large part of the diet, do not furnish necessary vitamins and minerals
for an adequate diet. Such food elements can be added to corn meal and grits at grinding by the use of a simple attachment on the mill to add the enrichment mixture. An educational program is being conducted to acquaint both farm and city people with this information and to aid millers in obtaining and using the enrichment equipment and mixture to improve their product.

**Visual Instruction:** Placed 16 mm. motion picture projector in each county agent's office and provide educational films for showing to farm people.

**Note:** A complete report of the work of the Clemson College Extension Service may be had by writing the Division of Publications, Clemson, South Carolina, for a copy of the publication entitled "Wartime and Peacetime Farming in South Carolina, 1945."