COMPREHENSIVE RESEARCH REVIEW
Ornamental Crops, Christmas Trees and Turf

TASK FORCE 9

N.C. Agricultural Experiment Station
N.C. State University
RALEIGH, N.C.
COMPREHENSIVE REVIEW SCHEDULE FOR ORNAMENTAL CROPS, CHRISTMAS TREES AND TURF

(TASK FORCE 9)

OCTOBER 23 (Monday)

8:15 - 9:15  Reviewers meet with SALS Administration
9:15 - 12:00 Reviewers tour campus facilities
12:00 - 1:00 Lunch
1:00 - 1:10 Purpose of Comprehensive Reviews - Dr. Ralph McCracken
1:10 - 1:30 Review of Task Force Report #9 - Dr. R. A. Larson
1:30 - 5:00 Research on RPA 906-1310 (Woody Ornamentals) - Dr. F. D. Cochran, discussion leader

OCTOBER 24 (Tuesday)

8:00 - 9:00 Complete Review for Woody Ornamentals
9:00 - 11:00 Research on RPA III (Christmas Trees only) - Dr. C. B. Davey, discussion leader
11:00 - 12:00 Research on RPA 906-1320 (Herbaceous Ornamentals) - Dr. R. A. Larson, discussion leader
12:00 - 1:00 Lunch
1:00 - 5:00 Continue review for Herbaceous Ornamentals

OCTOBER 25 (Wednesday)

8:00 - 12:00 Research on RPA 906-1330 (Lawn & Turf) - Dr. W. B. Gilbert, discussion leader
12:00 - 1:00 Lunch
1:00 - 5:00 Preparation of Review Team Report

OCTOBER 26 (Thursday)

8:00 - 9:00 Complete Review Team Report
9:00 - 10:30 Review Team to meet with SALS administration
10:30 - 12:00 Review Team to meet with Project Leaders and Department Heads in Room 121, Kilgore Hall
COOPERATING DEPARTMENTS
N. C. Agricultural Experiment Stations
N. C. State University
Raleigh, N. C.

Biological and Agricultural Engineering  Dr. F. J. Hassler, Dept. Head
Crop Science  Dr. P. H. Harvey, Dept. Head
Economics  Dr. W. D. Toussaint, Dept. Head
Entomology  Dr. K. L. Knight, Dept. Head
Forestry  Dr. C. B. Davey, Dept. Head
Horticultural Science  Dr. C. W. Donoho, Jr., Dept. Head
Plant Pathology  Dr. D. E. Ellis, Dept. Head
Soil Science  Dr. C. B. McCants, Dept. Head

PROGRAM PLANNING COMMITTEE

Dr. R. A. Larson, Task Force Leader  Horticultural Science
Dr. F. D. Cochran, Discussion Leader  Horticultural Science
Dr. C. B. Davey, Discussion Leader  Forestry
Dr. W. B. Gilbert, Discussion Leader  Crop Science
Dr. R. A. Larson, Discussion Leader  Horticultural Science

COMPREHENSIVE REVIEW TEAM

Dr. C. I. Harris, Chairman  CSRS
Dr. P. E. Nelson  Pennsylvania State University
Dr. J. D. Seeley  Cornell University
ESTIMATED VALUE OF ORNAMENTAL CROPS, CHRISTMAS TREES AND TURF

Production of ornamental crops, Christmas trees and turf is expanding in North Carolina. Excellent opportunities exist for both large and small growers. The size of individual operations continues to increase, but there will be continued opportunities for growers on small acreages to produce these high-valued crops.

The rapidly increasing population, the increase in new homes and buildings, and the emphasis on the environment and beautification insures an expanded market for fruits, vegetables and ornamental crops. These crops must be produced somewhere—North Carolina growers will be very much involved in expanded production of these crops.

Ornamental crops and Christmas trees accounted for $25,400,000 of North Carolina's farm income in 1970. An increase of 43 per cent in five years is predicted—with cash receipts from these crops of $38,300,000 in 1976.

I. ORNAMENTAL CROPS

Urbanization and affluence will continue to benefit the growers of ornamental crops, which include nursery crops, greenhouse crops, and flowers grown out of doors. Growers of these specialty items received $23.4 million for their efforts in 1970. In 1976 it is predicted they will receive $33.3 million—an increase of 42 per cent.

Nursery crop income is expected to increase from $9.6 million to $15 million. In addition to plants sold, considerable additional income for the 15,000 nursery operators in the State will come from landscaping and other services provided.

Income from flower crops is expected to rise from $13.7 million in 1970 to $18.2 million in 1976.

II. CHRISTMAS TREES

The rapidly expanding Christmas tree industry is made up of more than 600 small private landowners, many with limited financial resources, and few with any experience with this intensive culture crop. There is need for weed control, and marketing.

Despite the problems the new industry grew up fast, with 350,000 trees valued at more than $2 million sold in 1970—five times as many as were produced in 1965. Continued expansion is predicted during the next five years—to 750,000 trees valued at $4 million by 1976.

III. TURF

Presently there are 550,000 acres of turf grown in North Carolina. This includes lawns, playgrounds, athletic fields, highway rights-of-way, airports, cemeteries and golf courses. The intensity of use is different for each of these classes and directly governs the degree of management required to keep the turf in good condition.

As population rises and income and leisure increase, additional stress
<table>
<thead>
<tr>
<th>Name</th>
<th>Rank</th>
<th>Degree</th>
<th>Date</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomas F. Cannon</td>
<td>Asso. Prof.</td>
<td>Ph.D.</td>
<td>1958</td>
<td>Ohio State Univ.</td>
</tr>
<tr>
<td>Fred D. Cochran</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1942</td>
<td>Univ. of Calif.</td>
</tr>
<tr>
<td>John M. Jenkins, Jr.</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1946</td>
<td>Univ. of Minn.</td>
</tr>
<tr>
<td>Joseph W. Love</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1962</td>
<td>Ohio State Univ.</td>
</tr>
<tr>
<td>Eustace O. Beasley</td>
<td>Asst. Prof.</td>
<td>M.S.</td>
<td>1962</td>
<td>N. C. State Univ.</td>
</tr>
<tr>
<td>Carl T. Blake</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1963</td>
<td>Penn State Univ.</td>
</tr>
<tr>
<td>W. M. Lewis</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1957</td>
<td>Univ. of Minn.</td>
</tr>
<tr>
<td>Gerald A. Carlson</td>
<td>Asst. Prof.</td>
<td>Ph.D.</td>
<td>1969</td>
<td>Univ. of Calif. (Davis)</td>
</tr>
<tr>
<td>Richard A. King</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1951</td>
<td>Harvard Univ.</td>
</tr>
<tr>
<td>Edwin A. Proctor</td>
<td>Prof.</td>
<td>M.S.</td>
<td>1957</td>
<td>Univ. of Ky.</td>
</tr>
<tr>
<td>Charles B. Davey</td>
<td>Dept. Head</td>
<td>Ph.D.</td>
<td>1955</td>
<td>Univ. of Wisc.</td>
</tr>
<tr>
<td>Joe O. Lammi</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1954</td>
<td>Univ. of Calif.</td>
</tr>
<tr>
<td>Robert Aycock</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1949</td>
<td>N. C. State Univ.</td>
</tr>
<tr>
<td>Ronald K. Jones</td>
<td>Asst. Prof.</td>
<td>Ph.D.</td>
<td>1971</td>
<td>V.P.I.</td>
</tr>
<tr>
<td>David L. Strider</td>
<td>Prof.</td>
<td>Ph.D.</td>
<td>1959</td>
<td>N. C. State Univ.</td>
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</tbody>
</table>
ROBERT AYCOCK

Education:

B.S. - Louisiana State University 1940
M.S. - North Carolina State University 1942
Ph.D. - North Carolina State University 1949

Professional Employment:

Associate Plant Pathologist  Clemson College  1949-52
Plant Pathologist            Clemson College  1952-54
Associate Professor         North Carolina State University 1954-60
Professor                    North Carolina State University 1960-

Professional Responsibilities:

Research - Diseases of ornamental plants - Project NC 03260 - 100%
Teaching - PP 501 - 0%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):


JAMES R. BAKER

Education:

B.S. - North Carolina State University 1966
M.S. - North Carolina State University 1968
Ph.D. - University of Kansas 1972

Professional Employment:

Extension Assistant Professor North Carolina State University 1972

Professional Responsibilities:

Research - 0%
Teaching - 0%
Extension - Insect pests of floriculture, bulb, ornamental and Christmas tree culture - 100%

Research Publications Since 1966 (Task Force subject matter only):


This researcher is also junior author on two research publications cited in this report by other project leaders.
E. O. BEASLEY

Education:

B.S. - North Carolina State University 1958  
M.S. - North Carolina State University 1962

Professional Employment:

Research Instructor North Carolina State University 1958-64  
Extension Assistant Professor North Carolina State University 1967-

Professional Responsibilities:

Research - Mechanization of Horticultural Crops (cucumbers, tomatoes, sweet potatoes, cabbage) - Project 5073 - 40%  
Teaching - BAE 590 - 5%  
Extension - Mechanization of Horticultural Crops, 4-H Safety, and miscellaneous Extension work - 55%

Research Publications Since 1966 (Task Force subject matter only):

None
THOMAS F. CANNON

Education:

B.S. - North Carolina State University 1953
M.S. - North Carolina State University 1955
Ph.D. - Ohio State University 1958

Professional Employment:

Assistant Professor - North Carolina State University 1958-63
Associate Professor - North Carolina State University 1963-

Professional Responsibilities:

Research - Project 3111 - 40%
Teaching - 0%
Extension - Nursery Production - 60%

Research Publications Since 1966 (Task Force subject matter only):

G. A. CARLSON

Education:

B.S. - Oregon State University 1963
M.S. - University of California 1967
Ph.D. - University of California 1969

Professional Employment:

Assistant Professor North Carolina State University 1969-71

Professional Responsibilities:

Research - N.C. Experiment Sta. Projects - 3328, 3284, NSF IBP, and other 50%
Teaching - EC 650, and Grad. students thesis - 50%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):

None
FRED D. COCHRAN

Education:

B.S. - Clemson University 1932
M.S. - Louisiana State University 1933
Ph.D. - University of California 1942

Professional Employment:

Assistant Professor Louisiana State University 1936-39
Associate Professor Louisiana State University 1939-42
Professor Louisiana State University 1946-47
Professor North Carolina State University 1947-56
Professor, Department Head North Carolina State University 1957-67
Professor North Carolina State University 1967-

Professional Responsibilities:

Research - Azalea and Rhododendron breeding, studies of effects of gamma irradiation on selected horticultural plants, testing and propagation of dwarf loblolly pines - 40%
Teaching - HS 201 Principles of Horticulture, HS 599, & HS 699 Grad. Res. - 60%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):
None
C. B. DAVEY

Education:

B.S. - Syracuse University 1950
M.S. - University of Wisconsin 1952
Ph.D. - University of Wisconsin 1955

Professional Employment:

<table>
<thead>
<tr>
<th>Professional Position</th>
<th>Institution</th>
<th>Years</th>
</tr>
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<tbody>
<tr>
<td>Associate Professor</td>
<td>North Carolina State University</td>
<td>1962-65</td>
</tr>
<tr>
<td>Professor</td>
<td>North Carolina State University</td>
<td>1965-</td>
</tr>
<tr>
<td>Department Head - Forestry</td>
<td>North Carolina State University</td>
<td>1970-</td>
</tr>
</tbody>
</table>

Professional Responsibilities:

Research - Forest soils (microbiology and tree nutrition) - Project M-S 4040 25%
Teaching - SSC 472, SSC 632, FOR 562 - 25%
Extension - 0%
Administration - 50%

Research Publications Since 1966 (Task Force subject matter only):

None
MAURICE H. FARRIER

Education:
B.S. - Iowa State College 1948
M.S. - Iowa State College 1950
Ph.D. - North Carolina State Univ. 1955

Professional Employment:
Asst. to State Entomologist Office of State Entomology, Ames, Iowa 1948-49
Entomologist U.S. Army, Washington, D.C. 1952-54
Research Assistant North Carolina State University 1950-52
Associate Professor North Carolina State University 1955-

Professional Responsibilities:
Research - Mites at Comminuting Agents of Forest Litter - Project 3276, Taxonomy and Biology of Mesostigmata in Forest Litter and Soil, Bibliographical Controls in Biology - 50%
Teaching - Ent 401, 301, 542, For s264 - 50%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):


WILLIAM B. GILBERT

Education:

B.S. - Berea College 1942
M.S. - University of Kentucky 1952
Ph.D. - North Carolina State University 1956

Professional Employment:

Vocational Agricultural Teacher Richmond, Kentucky 1946-47
Vocational Agricultural Teacher Lexington, Kentucky 1948-51
Graduate Assistant, Forages University of Kentucky 1951-52
Graduate Assistant North Carolina State University 1953-56
Research Agronomist, Assigned to the North Carolina Peruvian AID Contract in Peru 1956-58
Assistant Professor North Carolina State University 1958-64
Associate Professor North Carolina State University 1964-

Professional Responsibilities:

Research - Turf Research Management Program - 60%
Teaching - CS 315 Turf Management and Advisor to 49 Ag Inst. Majors in Turf Management - 40%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):


This researcher is also junior author on one research publication cited in this report by another project leader.
LARRY F. GRAND

Education:
- B.S. - Pennsylvania State University 1962
- M.S. - Pennsylvania State University 1964
- Ph.D. - Pennsylvania State University 1967

Professional Employment:
- Assistant Professor North Carolina State University 1967-71
- Associate Professor North Carolina State University 1971-

Professional Responsibilities:
Research - Ecology of forest tree diseases and wood deterioration - Project NC 04012; Physiology of tree diseases and wood deterioration - Project NC 03114 - 40%
Teaching - PP 318 - PP 625 - 40%
Extension - Diseases of woody plants - 20%

Research Publications Since 1966 (Task Force subject matter only):


R. Gordon Halfacre

Education:
- B.S. - Clemson University 1963
- M.S. - Clemson University 1965
- Ph.D. - Virginia Polytechnic Institute 1968

Professional Employment:
- Assistant Professor North Carolina State University 1968-71
- Associate Professor North Carolina State University 1971-

Professional Responsibilities:
- Research - Propagation of Mountain Laurel and Other Related Species - Project NEW - 20%
- Teaching - HS 343 Landscape Horticulture, HS 414 Residential Landscape Design, HS 411 Nursery Management - 80%
- Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):


JOHN M. JENKINS, JR.

Education:
B.S. - Clemson University 1929
M.S. - Louisiana State University 1931
Ph.D. - University of Minnesota 1946

Professional Employment:
Professor North Carolina State University 1949-

Professional Responsibilities:
Research - Floriculture and vegetable crops - Project 3322, Gladiolus breeding, variety tests. 100%
Teaching - 0%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):


RONALD K. JONES

Education:

B.S. - Virginia Polytechnic Institute 1961
M.S. - University of Delaware 1963
Ph.D. - University of Florida 1965
Ph.D. - Virginia Polytechnic Institute 1971

Professional Employment:

Extension Specialist - Clemson University 1965-68
Instructor - Virginia Polytechnic Institute 1968-70
Assistant Professor, Ext. Spec. - North Carolina State University 1970-

Professional Responsibilities:

Research - Diseases of ornamental flowering bulbs and field-grown cut flower crops - Project 5076 - 50%
Teaching - 0%
Extension - State-wide responsibilities for disease and their control on woody ornamentals, floriculture crops, Christmas trees, blueberries, strawberries, and grapes - 50%

Research Publications Since 1966 (Task Force subject matter only):


This researcher is also junior author on one research publication cited in this report by another researcher.
RICHARD A. KING

Education:

- B.S. - University of Connecticut 1946
- M.S. - University of California 1947
- M.P.A. - Harvard University 1948
- Ph.D. - Harvard University 1951
- Post doctoral study, University of Chicago 1954-55

Professional Employment:

- Field Assistant, Farm Management, University of Connecticut 1944-45
- Assistant Professor, University of Connecticut 1948-50
- Associate Professor, North Carolina State University 1951-55
- Professor, North Carolina State University 1956-
- M.G. Mann Professor, North Carolina State University 1957-
- Visiting Lecturer, Graduate School of Business Administration, University of Virginia 1961-63
- N. C. Agricultural Mission to Peru 1964-65
- Visiting Professor, University of California (Spring) 1969

Professional Responsibilities:

- Research - 50%
- Teaching - 50%
- Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):


ROY A. LARSON

Education:

B.S. - University of Minnesota 1953
M.S. - University of Minnesota 1957
Ph.D. - Cornell University 1961

Professional Employment:

Assistant Professor  North Carolina State University  1961-65
Associate Professor  North Carolina State University  1965-68
Visiting Associate Professor  University of California  1967-68
Professor  North Carolina State University  1968-

Professional Responsibilities:

Research  - Floricultural crops, growth regulators, dormancy and flower bud differentiations - Projects 3139 & 5014 - 50%  
Teaching  - HS 41 Flower Production, HS 441 Floriculture, HS 442 Floriculture II, HS 599 Research Principles - 50%  
Extension  - 0%

Research Publications Since 1966 (Task Force subject matter only):


W. M. LEWIS

Education:

B.S. - Texas A&M University 1952
M.S. - University of Minnesota 1956
Ph.D. - University of Minnesota 1957

Professional Employment:

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<tr>
<th>Position</th>
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<th>Years</th>
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<tr>
<td>Assistant Professor</td>
<td>North Carolina State University</td>
<td>1957-61</td>
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<tr>
<td>Associate Professor</td>
<td>North Carolina State University</td>
<td>1961-69</td>
</tr>
<tr>
<td>Professor</td>
<td>North Carolina State University</td>
<td>1969-</td>
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Professional Responsibilities:

- Research - Turf Weed Control - Project S-3298 - 25%
- Teaching - 0%
- Extension - Weed control in agronomic crops and turf - 75%

Research Publications Since 1966 (Task Force subject matter only):


J. PAUL LILLY

Education:

- B.S. - North Carolina State University 1965
- M.S. - North Carolina State University 1971

Professional Employment:

- Research Assistant North Carolina State University 1968-

Professional Responsibilities:

- Research: "Nutrition and Soil Management Studies on Muscadine Grape and Rabbiteye Blueberry". Boron and soil pH requirements of muscadine grape; and soil pH requirements and N-P-K nutrition of rabbiteye blueberry, - Project 3337, "Nutrition and soil management studies on commercially grown flower crops." The main emphasis is on Gladiolus nutrition, - Project 3338 - 100%
- Teaching - 0%
- Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):

None

This researcher is also junior author on one research publication cited in this report by another project leader.
HUGH L. LINER

Education:
B.S. - North Carolina State University 1956
M.E. - North Carolina State University 1957
Ph.D. - North Carolina State University 1967

Professional Employment:
Assistant County Agent North Carolina State University
Associate Professor (Ext. Econ) North Carolina State University 1960-71

Professional Responsibilities:
Research - 0%
Teaching - EC 303 Farm Management, EC 523 Planning Farm and Area Adjustments 30%
Extension - Farm Management with a commodity interest in horticulture and an economic emphasis on credit and farm growth 70%

Research Publications Since 1966 (Task Force subject matter only):
JOSEPH W. LOVE

Education:

B.S. - Louisiana State University 1957
M.S. - The Ohio University 1959
Ph.D. - The Ohio University 1962

Professional Employment:

Assistant Professor  Rutgers, The State University 1962-63
Extension Assistant Professor North Carolina State University 1963-66
Extension Associate Professor North Carolina State University 1966-70
Extension Professor North Carolina State University 1970-

Professional Responsibilities:

Research - Floricultural crops - 15%
Teaching - 0%
Extension - Floricultural crops - 85%

Research Publications Since 1966 (Task Force subject matter only):


PAUL V. NELSON

Education:

B.S. - University of Massachusetts 1960
M.S. - Pennsylvania State University 1961
Ph.D. - Cornell University 1964

Professional Employment:

Assistant Professor North Carolina State University 1965-68,
Associate Professor North Carolina State University 1968-

Professional Responsibilities:

Research - Active Nutrient Uptake by Horticultural Plant Foliage - Project 3369, Foliar Analysis Standards and Improved Nutritional Evaluation Procedures for Florists' Crops - Project proposed - 50%
Teaching - HS 22 Greenhouse Operations - HS 622 Mineral Nutrition in Horticultural Plants - 50%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):


RICHARD K. PERRIN

**Education:**

- B.S. - Iowa State University 1960
- Ph.D. - Iowa State University 1968

**Professional Employment:**

<table>
<thead>
<tr>
<th>Position</th>
<th>Institution</th>
<th>Years</th>
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<tbody>
<tr>
<td>Assistant Professor</td>
<td>North Carolina State University</td>
<td>1968-72</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>North Carolina State University</td>
<td>1972-</td>
</tr>
</tbody>
</table>

**Professional Responsibilities:**

- Research: Beef Production in the South - Project 1067, Tropical Soils (AID contract) and Economics of Christmas Tree Production - Project 2500 - 50%
- Teaching: EC 212, 491, and 551 - 50%
- Extension: 0%

**Research Publications Since 1966 (Task Force subject matter only):**

None
EDWIN A. PROCTOR

Education:

B.S. - University of Kentucky 1945
M.S. - University of Kentucky 1957

Professional Employment:

Extension Professor  North Carolina State University  1959-71

Professional Responsibilities:

Research - 0%
Teaching - 0%
Extension - Fruit and vegetable marketing 100%

Research Publications Since 1966 (Task Force subject matter only):


This researcher is also junior author on two research publications cited in this report by other project leaders.
RONALD E. SNEED

Education:

B.S. - North Carolina State University 1959
Ph.D. - North Carolina State University 1971

Professional Employment:

Instructor North Carolina State University 1960-70
Assistant Professor North Carolina State University 1971-

Professional Responsibilities:

Research - Cooperator on eight projects in Fruit and Vegetable research - 0%
Teaching - BAE, Irrigation, Terracing and Erosion Control - 20%
Extension - Water management with primary interest in irrigation and home water quality and systems - 80%

Research Publications Since 1966 (Task Force subject matter only):

None
RONALD L. SPANGLER

Education:

B.S. - Purdue University 1966
M.S. - Purdue University 1968
Ph.D. - Michigan State University 1971

Professional Employment:

Assistant Professor, Extension, North Carolina State University 1971-

Professional Responsibilities:

Research - Weed control & growth regulators - 35%
Teaching - 0%
Extension - Nursery production - 65%

Research Publications Since 1966 (Task Force subject matter only):

None
D. L. STRIDER

Education:
B.S. - North Carolina State University 1956
M.S. - North Carolina State University 1957
Ph.D. - North Carolina State University 1959

Professional Employment:
Research Assistant Professor  North Carolina State University 1959-64
Associate Professor  North Carolina State University 1964-70
Professor  North Carolina State University 1970-

Professional Responsibilities:
Research - 100%
Teaching - 0%
Extension - 0%

Research Publications Since 1966 (Task Force subject matter only):
Duncan, Harry, J. C. Wells, and D. L. Strider. 1967. Disease control for
Note 144. 4p.

ledonary symptoms in screening for resistance to tomato bacterial canker
and in host range studies. Phytopathology 58:233-239.


Strider, D. L. 1966. Tomato early blight, Alternaria solani. In Results of

Phytopathology 57:1067-1071.


Phytopathology 58:731. (Abstr).

Strider, D. L. 1969. The foliage blight phase of bacterial canker of tomato and
survival of Corynebacterium michiganense in toxicants and in an air-dried

Strider, D. L. 1969. Bacterial canker of tomato caused by Corynebacterium

Strider, D. L., and R. B. Chalfant. 1966. Tomato (plant bed) pesticide phytoto-