1979

Ninety-Second Annual Report of the Tennessee Agricultural Experiment Station, 1979

University of Tennessee Agricultural Experiment Station

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Ninety-Second Annual Report of the Tennessee Agricultural Experiment Station 1979

The University of Tennessee Knoxville
The University of Tennessee
Agricultural Experiment Station

1. Knoxville Experiment Station
2. Martin Experiment Station
3. UT Energy Research and Development Administration Comparative Animal Research Laboratory
4. Dairy Experiment Station
5. Highland Rim Experiment Station
6. Middle Tennessee Experiment Station
7. Plateau Experiment Station
8. Tobacco Experiment Station
9. West Tennessee Experiment Station
10. Ames Plantation
11. Cumberland Forestry Field Station*
12. Friendship Forestry Field Station*
13. Highland Rim Forestry Field Station*
14. Milan Experiment Station
15. Oak Ridge Forest and Arboretum*

*Forestry Experiment Station
LETTER OF TRANSMITTAL

Knoxville, Tennessee
January 2, 1980

To His Excellency, Lamar Alexander
Governor of Tennessee:

SIR: I have the honor of transmitting herewith, on behalf of the Board of
Trustees of the University of Tennessee, a report of the work and expenditures of
the Agricultural Experiment Station for the year 1979.

This report is submitted in accordance with the law requiring that such a report
be submitted annually by the administrators of the Experiment Station to the
Governor of the State.

Respectfully submitted,
Edward J. Boling, President

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Ninety-Second Annual Report

of the

Tennessee Agricultural Experiment Station

1979

FOREWORD

Included in this report are listings by departments of the following information:

1) Research projects active as of December 31, 1979;
2) Research projects terminated during the calendar year 1979;
3) Bulletins, articles, and reports prepared by Experiment Station staff members and published during the calendar year 1979.

In addition, this report contains the financial statement for the Agricultural Experiment Station covering the period July 1, 1978 to June 30, 1979. Also included is a list of the Experiment Station personnel for the calendar year 1979.

Active Projects

As of December 31, 1979, there were 161 Hatch (TN) projects and nine State (S) projects. Hatch projects are supported in part with Federal-Grant funds made available by Congress to the Agricultural Experiment Stations of the country under the Hatch Act Amended. State projects are supported entirely by University funds. There were 11 McIntyre-Stennis (forestry) projects.

The headquarters of the Tennessee Agricultural Experiment Station is located on the agricultural campus of the University of Tennessee at Knoxville. The UT-Comparative Animal Research Laboratory is located some 20 miles distant at Oak Ridge, Tennessee. In addition, there are other research centers which represent soil and climate conditions in the major regions of Tennessee. These other research centers are listed at the end of this report, and their locations are shown on the inside front cover.

Projects Terminated

During 1979, 43 projects were terminated. Reports on these projects have either been published or are being prepared for publication.

Publications

Published reports on research of the Tennessee Agricultural Experiment Station appear in Station Bulletins, in Tennessee Farm and Home Science, as well as in professional and technical periodicals and in various popular publications. There were nine Station Bulletins published during the year. The number of technical, semi-technical, and popular articles prepared by staff members and published during 1979 was 183. In addition, staff members published 13 Extension-type publications, regional bulletins, and special reports.
## FINANCIAL STATEMENT

July 1, 1978 — June 30, 1979

The University of Tennessee Agricultural Experiment Station

<table>
<thead>
<tr>
<th>Funds Available</th>
<th>Hatch Act-Amended</th>
<th>McIntire Stennis</th>
<th>Animal Health and Disease</th>
<th>Federal Specific Grants</th>
<th>Other Funds</th>
<th>Total All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funds Available</td>
<td>12,486,079.32</td>
<td>$513,954.78</td>
<td>$235,419.95</td>
<td>$37,032.70</td>
<td>$94,031.97</td>
<td>10,683,489.76</td>
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</table>

### Expenditures:

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<th>Expenditures</th>
<th>Hatch Act-Amended</th>
<th>McIntire Stennis</th>
<th>Animal Health and Disease</th>
<th>Federal Specific Grants</th>
<th>Other Funds</th>
<th>Total All</th>
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<tbody>
<tr>
<td>Personal Services</td>
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<td>$503,103.33</td>
<td>$232,330.62</td>
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<td>Equipment</td>
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<td>11,888.68</td>
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<tr>
<td>Land &amp; Structures</td>
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<td>126,287.04</td>
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<td>Personnel Benefits</td>
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<td>1,184,767.54</td>
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<td>All Other</td>
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<td>6,567.48</td>
<td>1,810.86</td>
<td>12,195.47</td>
<td>4,170.32</td>
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<tr>
<td>Unexpended Balances*</td>
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<td>35,543.18</td>
<td>752,625.93</td>
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<tr>
<td><strong>TOTALS</strong></td>
<td><strong>$2,486,079.32</strong></td>
<td><strong>$513,954.78</strong></td>
<td><strong>$235,419.95</strong></td>
<td><strong>$37,032.70</strong></td>
<td><strong>$94,031.97</strong></td>
<td><strong>10,683,489.76</strong></td>
</tr>
</tbody>
</table>

*Includes Carryover Obligations
AGRICULTURAL BIOLOGY

Proj. No.  Research Project Titles

TN 467 (S-102)  An Integrated System for the Suppression of the Boll Weevil.
TN 468 (S-105)  Host Plant Resistance in Cotton to Insects, Mites, Nematodes and Diseases.
TN 469 (S-76)  Nature and Extent of Variation in Root-Knot and Cyst Nematodes.
TN 473  Biology and Ecology of Culicidae and Tabanidae.
TN 514  Biosystematics and Biological Control of Coccoidea Species in Tennessee.
TN 525 (S-90)  Rhizosphere Ecology as Related to Plant Health and Vigor.
TN 527 (S-70)  Virus Corn Diseases and Sorghum.
TN 533  Identification and Pathogenicity of Selected Plant-Parasitic Nematodes in Tennessee.
TN 536  Role of Face Flies in Epidemiology of Infectious Bovine Keratoconjunctivitis (IBK).
TN 537  Control of Lepidopterous Pests on Field Corn.
TN 544  Management of Vegetable Insect Pests.
TN 545  Ecology and Control of Forage and Pasture Insect Pests.
TN 557  Susceptibility of Cotton Cultivars to Seedling Pathogens.
TN 571  Evaluation of Insecticides for Use on Minor Crops in Tennessee.
TN 573  Control of Tobacco Insects.
TN 578  Etiology and Control of Small Grain Diseases.
TN 580  Diseases of Ornamentals and Nursery Crops.
TN 590  Detection and Control of Soybean Diseases.
TN 591  Breeding for Disease Resistance in Dark Tobacco.
TN 594  Etiology, Ecology, and Control of Cotton Diseases.
TN 595  Biology, Ecosystem Dynamics, and Control of Soybean Diseases.
S 87  Pesticide Impact Assessment Research and Data Analysis.

Projects Concluded in 1979

TN 395  Effect of Soil Environmental Conditions on Occurrence and Quantity of Cotton Seedling Pathogens.
TN 415  Breeding Disease Resistant Dark Tobacco.
TN 418  Diseases of Small Grains.
TN 419  Diseases of Ornamentals and Nursery Crops.
TN 420  Etiology and Control of Vegetable Diseases.
TN 421  Control of Tobacco Insects.
TN 423  Biology and Control of Cotton Diseases.
TN 431  Detection and Control of Soybean Diseases.
NINETY-SECOND ANNUAL REPORT

Bulletins, Articles, and Reports — 1979


AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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<tbody>
<tr>
<td>TN 385</td>
<td>The Impact of Demographic Changes of Tennessee Rural Population.</td>
</tr>
<tr>
<td>TN 432C</td>
<td>Alternative Systems of Swine Production.</td>
</tr>
<tr>
<td>TN 443</td>
<td>Economics of Producing and Marketing Woody Ornamentals in the South.</td>
</tr>
<tr>
<td>TN 451</td>
<td>Economic Analysis of Selected Technologies for Producing Burley Tobacco.</td>
</tr>
</tbody>
</table>
Projects Concluded in 1979

TN 382  The Impact of Demographic Changes on Tennessee Rural Population.
TN 388  Social and Psychological Factors Related to Managerial Success.
TN 439  Tennessee Rural Change Perspectives.
TN 519  The Effects of Changing Food Prices and Other Intervening Variables on Food Acceptance.

TN 465  Analysis of Factors Affecting the Short-Run and Long-Run Demand for Broiler Meat at Wholesale and Retail Market Levels.
TN 466  Marketing Performance of Selected Milk Pricing Systems for the Southern Region.
TN 484  Assessed Needs Among Elderly in Rural Tennessee.
TN 488  Price Discovery and Informational Flows for Major Agricultural Commodities in the Southern Region.
TN 489  Supply, Pricing, and Marketing Alternatives for Cattle, Beef Systems in the South.
TN 492  Efficiency of Identification, Assembly and Transportation of Cotton to Mills and Export Outlets.
TN 493  Impact of Farmers Home Administration Financing on Rural Housing.
TN 495  The Potential Use of Futures Market Pricing Strategies for Tennessee Agricultural Products.
TN 496  Social Organization for Development of Low-Income Rural Counties.
TN 497  Analysis of Domestic Food Demand and Consumption Behavior.
TN 509  Farm Adjustment Opportunities on Commercial Farms in Tennessee.
TN 523  Organization and Efficiency of the Fruit and Vegetable Production—Marketing Subsector in the South.
TN 529  Flexibility of Beef Production from Forage in Tennessee.
TN 530  Legal Techniques Available to Farmers in the Management, Accumulation and Disposal of Capital Assets.
TN 553  Housing for Low- and Moderate-Income Families.
TN 556  Farm Organization and Its Effect on Rural Society.
TN 603  The Socioeconomic Structure of Agriculture: Impacts and Sources of Change.


### AGRICULTURAL ENGINEERING

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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<tbody>
<tr>
<td>TN 432B</td>
<td>Alternative Systems of Swine Production.</td>
</tr>
<tr>
<td>TN 494</td>
<td>Evaluation of Selected Physical Properties Affecting Handling of Tennessee Vegetables.</td>
</tr>
<tr>
<td>TN 516</td>
<td>The Effect of Cotton Fiber Physical Properties on Dust Levels and on Yarn Characteristics.</td>
</tr>
<tr>
<td>TN 522</td>
<td>Abrasive Band Cutting Device for Severance of Soybean Plants.</td>
</tr>
<tr>
<td>TN 577</td>
<td>Curing, Storing and Feeding High Value Hay in Large Packages.</td>
</tr>
<tr>
<td>TN 587</td>
<td>Use of the Earth as an Energy Source or Sink for Heating and Cooling Buildings.</td>
</tr>
<tr>
<td>TN 602</td>
<td>Energy Reduction for On-Farm Processing of Agricultural Products (contributing to Regional Proj. S-147).</td>
</tr>
<tr>
<td>R11-1415-13</td>
<td>E. I. duPont deNemours Grant — Application of Titanium Dioxide on Agricultural Land.</td>
</tr>
<tr>
<td>R11-1415-17</td>
<td>A Modular Dryer for Large Hay Packages Using Solar Heated Air.</td>
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</table>

#### Projects Concluded in 1979

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN 477</td>
<td>Minimum Tillage Equipment for Corn and Vegetable Crops.</td>
</tr>
</tbody>
</table>

#### Bulletins, Articles, and Reports — 1979


**ANIMAL SCIENCE**

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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</thead>
<tbody>
<tr>
<td>TN 284</td>
<td>Factors Affecting the Rates of Genetic Improvement of Dairy Cattle.</td>
</tr>
<tr>
<td>TN 432A</td>
<td>Alternate Systems of Swine Production.</td>
</tr>
<tr>
<td>TN 433</td>
<td>Pre- and Post-Weaning Management of Beef Calves.</td>
</tr>
<tr>
<td>TN 449</td>
<td>Reproductive Efficiency in the Bovine Male.</td>
</tr>
<tr>
<td>TN 459</td>
<td>Beef Production of Different Size Cows Giving Different Amounts of Milk on Different Pastures.</td>
</tr>
<tr>
<td>TN 462</td>
<td>Winter Feeding Dry Brood Cows for Efficient Beef Production.</td>
</tr>
<tr>
<td>TN 463</td>
<td>Improvement of Reproductive Performance in Cattle.</td>
</tr>
<tr>
<td>TN 471</td>
<td>Development of Improved Feeder Calf Classification Procedures.</td>
</tr>
<tr>
<td>TN 474</td>
<td>Effect of Feeding Regimen in Gestation on First Lactation of Dairy Heifers.</td>
</tr>
<tr>
<td>TN 478</td>
<td>Quantitation of the Selenium and Vitamin E Requirements of Swine.</td>
</tr>
<tr>
<td>TN 481</td>
<td>Breeding Methods for Beef Cattle in the Southern Region (contributing to Regional Proj. S-10).</td>
</tr>
<tr>
<td>TN 482</td>
<td>Genetic Methods of Improving Dairy Cattle for the South (contributing to Regional Proj. S-49).</td>
</tr>
<tr>
<td>TN 498</td>
<td>Etiology and Control of Hypomagnesemic Tetany in Ruminants Utilizing Cool Season Grasses (contributing to Regional Proj. S121).</td>
</tr>
<tr>
<td>TN 503</td>
<td>Mycoplasma Gallisepticum and Mycoplasma Synoviae Infections in Commercial Egg Producing Flocks.</td>
</tr>
<tr>
<td>TN 504</td>
<td>Endocrine Relationship in the Mastitis Metritis Agalactia (MMA) Complex in Pigs.</td>
</tr>
<tr>
<td>TN 511</td>
<td>Hormonal Relationships in Egg Shell Formation (contributing to Regional Proj. S131).</td>
</tr>
<tr>
<td>TN 512</td>
<td>Alternatives for Finishing Cattle in Tennessee.</td>
</tr>
<tr>
<td>TN 515</td>
<td>Endocrine Factors Associated with Transport of Molecules into and out of the Uterus.</td>
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<tr>
<td>TN 528</td>
<td>Factors Affecting Nutrient Consumption and Digestibility of Grazed and Harvested Forages.</td>
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<tr>
<td>TN 529</td>
<td>Flexibility of Beef Production from Forages in Tennessee.</td>
</tr>
<tr>
<td>TN 531</td>
<td>Induced Pauses in Laying Hens.</td>
</tr>
<tr>
<td>TN 535</td>
<td>Absorption of Minerals in Large Animals.</td>
</tr>
<tr>
<td>TN 538</td>
<td>Effect of Heterosis on Nutritional Efficiency of Beef Production.</td>
</tr>
</tbody>
</table>
Evaluation of Overseeding Systems for Improvement of Pastures for Beef Production.


The Etiopathology of Avian Glaucoma.

Vitamin Injections for Beef Cows.

Nutritional Systems for Swine to Increase Reproductive Efficiency (contributing to Regional Proj. S145).

Management of Purchased Feeder Pigs.

Biochemical and Histological Evaluation of Thiamin Effects on Land Intoxication in Cattle.

Adrenocorticotrophin Involvement in Stress Related Early Embryonic Mortality in Swine.

Development of Low-Protein Broiler Diets.

Swine Testing and Evaluation.

Bull Evaluation.

Exotic Breeds of Sheep to Increase Lamb Production in Tennessee.

Nutritive Value of Agricultural and Industrial Waste Products.

Effect of Initial Weight and Winter Feeding Level on Subsequent Performance of Slaughter Beef Heifer.

Maximum Utilization of High Quality Forages for Dairy Cattle.


Miller, J. K., M. C. Bell, and Nancy Ramsey. Hypomagnesemia and Insulin in Cows Overwintered on Stockpiled Fescue Pasture or Changed Abruptly from Stored Feed to Lush Spring Pasture. Tennessee Farm and Home Science Number 112:16-18, 1979.


**CHILD AND FAMILY STUDIES**

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Title</th>
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<tbody>
<tr>
<td>TN 520</td>
<td>Career Projections and Attainment of Low-Income Youth: Changes Over Time.</td>
</tr>
<tr>
<td>(S-126)</td>
<td>Project Concluded in 1979</td>
</tr>
<tr>
<td>TN 513</td>
<td>Role Perception of Working and Non-Working Mothers in Rural and Urban Areas.</td>
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**Bulletins, Articles, and Reports — 1979**


**COMPARATIVE ANIMAL RESEARCH LABORATORY**

<table>
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<th>Proj. No.</th>
<th>Research Project Titles</th>
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<tr>
<td>TN 569</td>
<td>Platelet Function in Hypomagnesemic Ruminants.</td>
</tr>
<tr>
<td>TN 585</td>
<td>Selection of Mutant Germplasm for Crop Improvement.</td>
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<tr>
<td>TN 586</td>
<td>Mineral-Hormonal Interrelationships to Hypomagnesemia in Ruminants.</td>
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<tr>
<td>0210*</td>
<td>Late Somatic Effects of Energy Pollutants.</td>
</tr>
<tr>
<td>2655*</td>
<td>Plant Biomass and Energy Conservation.</td>
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*U.S. Department of Energy project numbers.

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Projects Concluded in 1979</th>
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<td>TN 390</td>
<td>Comparative Metabolism of Micro- and Macro-Elements in Animals.</td>
</tr>
<tr>
<td>TN 401</td>
<td>Mutagenesis and the Development of Mutant Germplasm in Economic Plants.</td>
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<td>TN 410</td>
<td>Species Comparison of Pre- and Post-Natal Utilization of Mineral Elements.</td>
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### FOOD SCIENCE, NUTRITION, AND FOOD SYSTEMS ADMINISTRATION

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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<tr>
<td>TN 450</td>
<td>Effect of Vegetarian Diets on Bone Density and Nutrient Intakes of Aging Women.</td>
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<tr>
<td>TN 500</td>
<td>Functional Properties of Plant Proteins as Influenced by Other Ingredients of Formulated Foods.</td>
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<tr>
<td>TN 501</td>
<td>Effect of Dietary Sulfur on Protein Metabolism.</td>
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<tr>
<td>TN 502</td>
<td>Metabolic Alterations in Obesity.</td>
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<tr>
<td>TN 507</td>
<td>Influence of Dietary Protein on Renal Function, Protein Status and Longevity of Male Rats.</td>
</tr>
<tr>
<td>TN 519</td>
<td>The Effects of Changing Food Prices and Other Intervening Variables on Food Acceptance.</td>
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<tr>
<td>TN 542</td>
<td>Effects of Xenobiotics on Sulfur Metabolism.</td>
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<tr>
<td>TN 572</td>
<td>Factors Affecting Food Habits of Adolescents and Young Adults.</td>
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<tr>
<td>TN 605</td>
<td>Nutritional Health of Adolescent Females.</td>
</tr>
<tr>
<td>TN 611</td>
<td>Interrelationship Between Food Restriction and Metabolism of Drugs and Chemicals.</td>
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**Project Concluded in 1979**

| TN 384    | Patterns of Food Intake and Nutritional Health of Girls. |
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FOOD TECHNOLOGY AND SCIENCE

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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<tbody>
<tr>
<td>TN 437</td>
<td>The Influence of Processing Factors in Dry-Cured Ham Quality.</td>
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<tr>
<td>TN 452</td>
<td>Use of Protein Isolates and Vegetable Fats in Manufactured Meat Products.</td>
</tr>
<tr>
<td>TN 453</td>
<td>Utilization of Acid Cheese Whey for Food Products.</td>
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<tr>
<td>TN 505</td>
<td>Utilization of Modified and Unmodified Proteins in Baked Goods.</td>
</tr>
<tr>
<td>TN 508</td>
<td>Quality Evaluation of Vegetable Cultivars and Development of Food Products.</td>
</tr>
<tr>
<td>TN 547</td>
<td>Quality and Shelf Life of Food Products in the Marketing Channels.</td>
</tr>
<tr>
<td>TN 558</td>
<td>The Use of Nonfat Dry Milk for the Manufacture of Mozzarella Cheese.</td>
</tr>
<tr>
<td>TN 592</td>
<td>Control of Aflatoxin and Related Mycotoxins in Agri Commodities Processed Foods and Finished Foods.</td>
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</tbody>
</table>
Antimicrobial Properties of Naturally Occurring Compounds and Currently Approved Food Additives.

Lipids and Their Relationship to Food Quality.

Physical Chemical and Histological Traits of Muscle Associated With Composition and Palatability.

Pesticides in/on Raw and Processed Foods.

Projects Concluded in 1979

Flavor Precursors in Protein Concentrates and Isolates.

Histological and Histochemical Relationships of Muscle to Meat Quality and Cutability.

Pesticides in/on Raw and Processed Foods.


Bulletins, Articles and Reports — 1979


FORESTRY, WILDLIFE, AND FISHERIES

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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</thead>
<tbody>
<tr>
<td>TN 107</td>
<td>Relationship of Soil and Other Site Factors to Forest Composition and Productivity.</td>
</tr>
<tr>
<td>TN 470</td>
<td>Breeding Strategies for Genetic Improvement of Commercial Forest Trees in the South.</td>
</tr>
<tr>
<td>Tn 491</td>
<td>Freshwater Food Animals.</td>
</tr>
<tr>
<td>TN 521</td>
<td>Culture and Management of Selected Game Fishes.</td>
</tr>
<tr>
<td>TN 599</td>
<td>Applied Physiology of Economically Important Fishes.</td>
</tr>
<tr>
<td>TN 601</td>
<td>Reclamation of Drastically Disturbed Soils.</td>
</tr>
</tbody>
</table>
### M-S 16
Economic Importance of Tennessee's Forest Resource and Wood Products Industries.

### M-S 19
Regeneration of Dendroctonous-killed Pine Stands in East Tennessee.

### M-S 21
Development of Systems Analytic and Simulation Techniques for Renewable Resources Management.

### M-S 22
Prescribed Fire for Site Preparation and Improved Pine Productivity in Tennessee Forests.

### M-S 23
Breeding of Upland Hardwoods.

### M-S 24
Breeding of Coniferous Trees.

### M-S 25
Defect Estimation of East Tennessee Hardwoods.

### M-S 26
Controlling Strip Mine Runoff.

### M-S 27
Natural History of Large Mammals in the Southern Appalachian Forests.

### M-S 28
Wood Quality Evaluation by Gamma-Ray Densitometry.

### M-S 29
Economic Impact of Death Taxes on Tennessee's Timber Resources.

### M-S 30
Effects of Manipulating Forest Habitats Upon the Physical Condition of Bobwhite Quail.

### M-S 31
Cultural Techniques for Improving the Survival and Growth of Trees.

### M-S 33
Visual Preferences of Recreationists During On-Site Engagements in Forest Environments.

### S 30
The University of Tennessee Arboretum.

### S 84
Implications for Wildlife of Land Use Patterns and Habitat Alterations in Tennessee.

**Projects Concluded in 1979**

### TN 207
Forest Tree Fertilization.

### M-S 9R
Characteristics of Juvenile and Branch Wood in Selected Eastern Hardwoods.

### M-S 17
Attitudes and Preferences Related to Forest Recreation Opportunities.

### M-S 20
Fragmentation of Large Forest Ownerships and Its Impact on Tennessee's Forest Economy.

### S 70
Forest Cutting and Water Yield.

### S 83
Strip Mine Revegetation.

**Bulletins, Articles, and Reports — 1979**


**ORNAMENTAL HORTICULTURE AND LANDSCAPE DESIGN**

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<td>TN 534</td>
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<td>TN 581</td>
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</tr>
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<td>TN 429</td>
<td>Chemical Control of Plant Growth in Florist Pot Plants and Bedding Plants.</td>
</tr>
</tbody>
</table>

**Bulletins, Articles, and Reports — 1979**


PLANT AND SOIL SCIENCE

<table>
<thead>
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<th>Research Project Titles</th>
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<td>Burley Tobacco Genetics and Breeding.</td>
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<td>TN 510</td>
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</tr>
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</tr>
</tbody>
</table>

**Projects Concluded in 1979**

| TN 399    | Soil and Plant Nutrient Status and Environmental Factors in Relation to Crop Yields. |
| TN 400    | Effect of Plant Environment on Its Photosynthetic Capability.          |
| TN 402    | Cotton Seed and Fiber Development.                                    |
| TN 403    | Cotton Production and Varietal Adaptation.                            |
| TN 404    | Forage Crop Production and Metabolic Patterns Under Different Management and Environmental Conditions. |
| TN 407    | Selectivity and Mode of Action of Herbicides and Antidotes.           |
| TN 409    | Development and Evaluation of Rootstocks for Peach (contributing to Regional Proj. S-97). |
| TN 411    | Vegetable Crop Production.                                            |
| TN 413    | Liming and Its Effect on Nutrient Availability.                       |
| TN 416    | Plant Growth Regulator Effects on Fruit, Vegetable, and Agronomic Crops. |
Bulletins, Articles, and Reports — 1979


**TEXTILES AND CLOTHING**

Proj. No.  
Research Project Title


**Bulletins, Articles, and Reports — 1979**

Thompson, Beth Ann and Anna J. Treece. The Flammability of Cotton, Polyester, and Cotton/Polyester Blend Fabrics as Measured by the MAFT.” Tennessee Farm and Home Science Number 112:8-11, 1979.

**STATION PERSONNEL — 1979**

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Knoxville, Tennessee 37901

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L. J. Washam, Graduate Research Assistant

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A. D. Lyons, Graduate Research Assistant
C. D. McDonald, Graduate Research Assistant
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P. A. Cope, Graduate Research Assistant
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C. E. Hill, Graduate Research Assistant

A. R. Johnson, Graduate Research Assistant
S. Kincaid, Research Associate
S. J. McCravy, Graduate Research Assistant
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S. Peng, Graduate Research Assistant
J. D. Roberts, Research Assistant
G. S. Smith, Associate Professor
H. van de Werken, Associate Professor

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B. V. Conger, Professor
T. C. Corbin, Graduate Research Assistant
T. D. Cordrey, Assistant Professor, Jackson
J. T. Crews, Graduate Research Assistant

J. R. Davis, Graduate Research Assistant
D. E. Deyton, Assistant Professor
J. R. Evans, Research Assistant
J. E. Freeny, Graduate Research Assistant
W. P. Fussell, Graduate Research Assistant
H. A. Fribourg, Professor
C. R. Graves, Associate Professor
C. L. Gupton\textsuperscript{1}, Associate Professor, Greeneville
R. M. Hayes, Assistant Professor, Jackson
M. J. Hood, Graduate Research Assistant

\textsuperscript{1}In cooperation with U.S. Department of Agriculture.
P. E. Hoskinson, Associate Professor, Jackson
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D. C. Jones, Graduate Research Assistant
N. S. Kearney, Jr., Graduate Research Assistant
J. M. Kennedy, Graduate Research Assistant
H. C. Kinser, Assistant Professor
W. A. Krueger, Associate Professor
G. M. Lessman, Associate Professor
R. J. Lewis, Associate Professor
D. A. Lietzke, Associate Professor
J. E. Lothrop, Graduate Research Assistant
J. K. McDaniel, Graduate Research Assistant
W. J. McLaurin, Assistant Professor
D. W. Monks, Graduate Research Assistant
C. A. Mullins, Associate Professor, Crossville

B. C. Nichols¹, Associate Professor, Greeneville
J. R. Overton, Associate Professor, Jackson
W. L. Parks, Professor
D. V. Peterson, Graduate Research Assistant
V. H. Reich, Associate Professor
J. H. Reynolds, Professor
K. M. Ross, Graduate Research Assistant
L. N. Skold, Professor
D. B. Smith, Graduate Research Assistant
W. E. Stevens, Graduate Research Assistant
J. M. Stewart¹, Associate Professor
D. D. Tyler, Assistant Professor, Jackson
D. R. West, Assistant Professor
C. S. Williams, Graduate Research Assistant
J. D. Wolt, Assistant Professor

TEXTILES AND CLOTHING

Anna Jean Treece, Professor and Head of Department
Irene L. Barnes, Graduate Research Assistant
Betsy C. Westlake, Graduate Research Assistant

PERSONNEL CHANGES

Appointments

William R. Abner, Graduate Research Assistant in Animal Science, September 10, 1979
John R. Adams, Graduate Research Assistant in Agricultural Economics, March 20, 1979
Jeffrey D. Arnold, Graduate Research Assistant in Animal Science, September 7, 1979
Bobby D. Banks, Graduate Research Assistant in Animal Science, June 15, 1979
Irene L. Barnes, Graduate Research Assistant, Department of Textiles and Clothing, September 1, 1979.
J. M. Black, Graduate Research Assistant in Food Technology and Science, January 1, 1979

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Roy B. Card, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, January 1, 1979
Ricky J. Carlisle, Graduate Research Assistant in Plant and Soil Science, March 12, 1979
W. J. Cheatham, Assistant Professor in Agricultural Engineering, November 26, 1979.
D. M. Churchville, Graduate Research Assistant in Food Technology and Science, September 1, 1979
P. A. Cope, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, September 1, 1979
Sherry Cunningham, Graduate Research Assistant in Agricultural Biology, March 26, 1979
John R. Davis, Graduate Research Assistant in Plant and Soil Science, July 1, 1979
P. M. Davidson, Assistant Professor in Food Technology and Science, August 1, 1979
J. W. Day, Assistant Professor in Ornamental Horticulture and Landscape Design, July 1, 1979
S. A. Devine, Graduate Research Assistant in Food Technology and Science, June 15, 1979
Dennis E. Deyton, Assistant Professor in Plant and Soil Science, September 17, 1979
F. A. Draughon, Assistant Professor in Food Technology and Science, April 16, 1979
Guy Dyer, Graduate Research Assistant in Animal Science, June 13, 1979
W. R. Dyer, Graduate Research Assistant in Food Technology and Science, June 15, 1979
Jerry E. Freeny, Graduate Research Assistant in Plant and Soil Science, January 1, 1979
Dale M. Garner, Graduate Research Assistant in Agricultural Economics, September 17, 1979
Billy B. Greene, Graduate Research Assistant in Animal Science, September 17, 1979
R. S. Guinn, Research Associate in Agricultural Engineering, July 1, 1979
W. E. Hart, Graduate Research Assistant in Agricultural Engineering, September 17, 1979
Lanny W. Hass, Graduate Research Assistant in Agricultural Economics, September 17, 1979
Richard N. Heitmann, Assistant Professor in Animal Science, August 31, 1979
Keith Henegar, Graduate Research Assistant in Agricultural Biology, September 17, 1979
C. E. Hill, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, March 26, 1979
David Hodge, Graduate Research Assistant in Animal Science, July 1, 1979
Charles M. Irwin, Graduate Research Assistant in Animal Science, June 18, 1979
W. M. Johnson, Graduate Research Assistant in Food Technology and Science, September 17, 1979
Donald C. Jones, Graduate Research Assistant in Plant and Soil Science, June 18, 1979
Henry G. Kattesh, Assistant Professor in Animals Science, January 22, 1979
Noble S. Kearney, Jr., Graduate Research Assistant in Plant and Soil Science, September 17, 1979
Charles D. Keiser, Graduate Research Assistant in Agricultural Economics, March 15, 1979
Thomas M. Keith, Graduate Research Assistant in Plant and Soil Science, September 17, 1979
Robert Kelly, Graduate Research Assistant in Agricultural Biology, September 17, 1979
Marcia Keyserling, Graduate Research Assistant in Agricultural Biology, January 1, 1979
Edward L. Lach, Jr., Graduate Research Assistant in Agricultural Economics, September 17, 1979
Dearl D. Lampley, Graduate Research Assistant in Animal Science, September 17, 1979
Robert P. Larkin, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 17, 1979
Kevin T. Leahy, Graduate Research Assistant in Animal Science, September 17, 1979
David A. Lietzke, Associate Professor in Plant and Soil Science, October 1, 1979
Alan D. Lyons, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 17, 1979
Judith K. McDaniel, Graduate Research Assistant in Plant and Soil Science, January 1, 1979
Cary D. McDonald, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 15, 1979
Michael R. McLaughlin, Assistant Professor in Agricultural Biology, July 1, 1979
Wayne J. McLaurin, Assistant Professor in Plant and Soil Science, May 29, 1979
Deborah D. McRae, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 17, 1979
John B. McRae, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, January 1, 1979
W. T. Mahoney, Graduate Research Assistant in Agricultural Engineering, January 1, 1979
Douglas R. Metzler, Graduate Research Assistant in Animal Science, September 17, 1979
Cregg D. Miyat, Graduate Research Assistant in Agricultural Economics, September 17, 1979
David W. Monks, Graduate Research Assistant in Plant and Soil Science, September 17, 1979
John A. Mullins, Jr., Research Associate in Forestry, Wildlife, and Fisheries, July 9, 1979
Gary Palmer, Graduate Research Assistant in Agricultural Biology, September 17, 1979
David V. Peterson, Graduate Research Assistant in Plant and Soil Science, September 17, 1979
Lydia J. Petersson, Research Associate in Agricultural Economics, July 2, 1979
Basil E. Pinker, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 17, 1979
A. R. Post, Graduate Research Assistant in Food Technology and Science, October 1, 1979
Christopher K. Reynolds, Graduate Research Assistant in Animal Science, September 17, 1979
John M. Richardson, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, July 1, 1979
Kelly R. Robbins, Assistant Professor in Animal Science, July 23, 1979
J. W. Roberts, Research Assistant in Ornamental Horticulture and Landscape Design, August 21, 1979
Katye M. Ross, Graduate Research Assistant in Plant and Soil Science, September 17, 1979
Ben T. Rudd, Graduate Research Assistant in Agricultural Economics, March 19, 1979
Nancy E. Sanders, Graduate Research Assistant in Animal Science, September 4, 1979
Bruce M. Saul, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, July 1, 1979
Robert Simpson, Graduate Research Assistant in Agricultural Biology, June 13, 1979
Daniel B. Smith, Graduate Research Assistant in Plant and Soil Science, September 17, 1979
Stuart Stein, Graduate Research Assistant in Agricultural Biology, September 17, 1979
William E. Stevens, Graduate Research Assistant in Plant and Soil Science, September 17, 1979
Clinton S. Strohmeir, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, January 1, 1979
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Glenn R. Wehner, Graduate Research Assistant in Animal Science, September 1, 1979
Dennis R. West, Assistant Professor in Plant and Soil Science, July 20, 1979
Glen D. Whipple, Assistant Professor in Agricultural Economics, December 17, 1979
Charles S. Williams, Graduate Research Assistant in Plant and Soil Science, June 15, 1979
Peter A. Williams, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 17, 1979
Jeffery D. Wolt, Assistant Professor in Plant and Soil Science, April 16, 1979
Terry L. Worley, Graduate Research Assistant in Animal Science, September 17, 1979
Terminations

Kenneth W. Bell, Graduate Research Assistant in Plant and Soil Science, August 21, 1979

Roger D. Billingsley, Graduate Research Assistant in Animal Science, August 24, 1979

C. C. Brandt, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 31, 1979

P. J. Bredderman, Associate Professor, Comparative Animal Research Laboratory, June 30, 1979

J. W. Brown, Administrative Assistant, Comparative Animal Research Laboratory, August 10, 1979

William F. Brown, Graduate Research Assistant in Animal Science, July 20, 1979

George J. Buntley, Associate Professor in Plant and Soil Science, February 28, 1979

S. L. Cantrell, Graduate Research Assistant in Food Technology and Science, August 31, 1979

C. B. Claiborne, Graduate Research Assistant in Food Technology and Science, March 12, 1979

James E. Clark, Graduate Research Assistant in Agricultural Economics, July 14, 1979

A. B. Cole, Graduate Research Assistant in Food Technology and Science, December 31, 1979

J. P. Conn, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 14, 1979

E. E. Cox, Graduate Research Assistant in Food Technology and Science, September 14, 1979

J. L. Crawford, Graduate Research Assistant in Food Technology and Science, December 31, 1979

George K. Criner, Graduate Research Assistant in Agricultural Economics, September 8, 1979

Gary E. Day, Graduate Research Assistant in Plant and Soil Science, December 31, 1979

William F. Drake, Graduate Research Assistant in Plant and Soil Science, February 28, 1979

Richard E. Estell, Graduate Research Assistant in Animal Science, August 15, 1979

James T. Fain, Graduate Research Assistant in Animal Science, June 30, 1979

Robert R. Fincher, Graduate Research Assistant in Plant and Soil Science, August 15, 1979

Richard C. Fudge, Graduate Research Assistant in Animal Science, March 30, 1979

Daniel N. Good, Graduate Research Assistant in Plant and Soil Science, August 31, 1979

Gerald F. Graham, Graduate Research Assistant in Agricultural Economics, June 1, 1979

R. S. Guinn, Graduate Research Assistant in Agricultural Engineering, June 30, 1979

P. M. High, Graduate Research Assistant in Agricultural Engineering, December 31, 1979

Joe H. Hope, III, Graduate Research Assistant in Agricultural Engineering, December 31, 1979

W. W. Huang, Biostatistician, Comparative Animal Research Laboratory, May 31, 1979

D. A. Hutsell, Graduate Research Assistant in Food Technology and Science, May 31, 1979

Barbara Innings, Graduate Research Assistant in Animal Science, April 30, 1979

George K. Jeffers, Graduate Research Assistant in Agricultural Biology, January 13, 1979

Pedro R. Jones, Graduate Research Assistant in Agricultural Biology, August 15, 1979

R. G. Jordan, Systems Analyst, Comparative Animal Research Laboratory, April 30, 1979

Thomas M. Keith, Graduate Research Assistant in Plant and Soil Science, October 31, 1979

B. J. Kelman, Assistant Professor, Comparative Animal Research Laboratory, August 3, 1979
S. Kincaid, Research Associate in Ornamental Horticulture and Landscape Design, August 10, 1979
William R. Knight, Graduate Research Assistant in Plant and Soil Science, May 4, 1979
Maurice R. Landes, Graduate Research Assistant in Agricultural Economics, March 10, 1979
Dale J. Leuck, Research Associate in Agricultural Economics, September 29, 1979
Randy R. Lyle, Graduate Research Assistant in Animal Science, June 13, 1979
V. J. McDonald, Jr., Information Officer, Comparative Animal Research Laboratory, August 24, 1979
Charles D. Manning, Graduate Research Assistant in Plant and Soil Science, March 20, 1979
D. R. Maxedon, Graduate Research Assistant in Food Technology and Science, August 31, 1979
D. M. Merryman, Graduate Research Assistant in Agricultural Engineering, April 1, 1979
Timothy S. Moore, Graduate Research Assistant in Agricultural Economics, July 14, 1979
Bradley Mullens, Graduate Research Assistant in Agricultural Biology, February 1, 1979
H. J. Norman, Graduate Research Assistant in Agricultural Engineering, April 1, 1979
Bobby G. Nutt, Graduate Research Assistant in Animal Science, August 31, 1979
Carolyn L. Orr, Graduate Research Assistant in Animal Science, August 24, 1979
Jerry K. Parker, Graduate Research Assistant in Animal Science, June 30, 1979
M. G. Pearsall, Graduate Research Assistant in Food Technology and Science, January 1, 1979
S. Peng, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, March 15, 1979
A. L. Platt, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 31, 1979
H. B. Quigley, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, December 31, 1979
Teresa Ragain, Graduate Research Assistant in Agricultural Biology, February 1, 1979
Nancy Ramsey, Graduate Research Assistant in Animal Science, September 14, 1979
J. C. Rennie, Associate Professor, Forestry, Wildlife, and Fisheries, October 1, 1979
Richard S. Ritter, Graduate Research Assistant in Animal Science, June 4, 1979
D. M. Robie, Assistant to the Director, Comparative Animal Research Laboratory, February 9, 1979
Ronald H. Rogers, Graduate Research Assistant in Plant and Soil Science, March 20, 1979
Gilbert N. Rhodes, Jr., Graduate Research Assistant in Plant and Soil Science, August 15, 1979
Dennis B. Seaton, Graduate Research Assistant in Plant and Soil Science, January 31, 1979
G. Lizabeth Self, Graduate Research Assistant, Department of Textiles and Clothing, August 31, 1979.
D. Shannon, Graduate Research Assistant in Animal Science, September 14, 1979
J. D. Shannon, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 30, 1979
Ronald R. Sharpe, Graduate Research Assistant in Plant and Soil Science, October 19, 1979
Carl R. Siegrist, Jr., Graduate Research Assistant in Agricultural Economics, March 31, 1979
G. E. Spalding, Associate Professor, Comparative Animal Research Laboratory, November 30, 1979
Felix J. Spinelli, Graduate Research Assistant in Agricultural Economics, October 3, 1979
C. S. Strohmeir, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, December 31, 1979
Clyde L. Viers, Graduate Research Assistant in Plant and Soil Science, March 16, 1979
E. K. Vollmar, Graduate Research Assistant in Food Technology and Science, January 1, 1979
Deborah K. Wagner, Graduate Research Assistant in Agricultural Economics, September 20, 1979
J. T. Walker, Instructor in Agricultural Engineering, February 1, 1979
William H. Wall III, Graduate Research Assistant in Plant and Soil Science, August 15, 1979
E. E. Watson, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 31, 1979
J. Keith Watson, Graduate Research Assistant in Agricultural Biology, January 12, 1979
Dennis J. Weller, Graduate Research Assistant in Agricultural Economics, September 6, 1979
W. E. Whitworth, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 30, 1979
Elaine K. Wiedemann, Assistant Communications Specialist, June 5, 1979

Changes of Titles
John A. Gillies, to Research Associate in Agricultural Economics, July 2, 1979
John P. Hitchcock, to Associate Professor in Animal Science, July 1, 1979
H. O. Jaynes, to Professor in Food Technology and Science, July 1, 1979
Ruth C. Johnson, to Research Associate in Agricultural Economics, November 12, 1979
C. C. Melton, to Professor in Food Technology and Science, July 1, 1979
Robert H. Orr, to Associate Professor in Rural Sociology, July 2, 1979
Charles D. Pless, to Professor in Agricultural Biology, July 1, 1979
F. D. Tompkins, to Associate Professor in Agricultural Engineering, July 1, 1979

Retirements
Horace C. Smith, Associate Professor in Plant and Soil Science, June 30, 1979
Maxwell E. Springer, Professor in Plant and Soil Science, June 30, 1979
Homer D. Swingle, Professor in Plant and Soil Science, January 15, 1979
Anna Jean Treece, Professor and Head, Department of Textiles and Clothing, August 31, 1979.
John H. Turner¹, Associate Professor in Plant and Soil Science, July 31, 1979
Smith Worley, Jr.¹, Associate Professor in Plant and Soil Science, August 31, 1979

Returned from Leave
F. W. Woods, Professor in Forestry, Wildlife and Fisheries, August 6, 1979

Transfer
Managing Editor in Graduate School of Biomedical Sciences, July 1, 1979

¹In Cooperation with U. S. Department of Agriculture