Eighty-Seventh Annual Report of the Tennessee Agricultural Experiment Station 1974

The University of Tennessee Knoxville
THE UNIVERSITY OF TENNESSEE
AGRICULTURAL EXPERIMENT STATION

1 Main Station
2 University of Tennessee at Martin
3 UT Energy Research and Development Administration Comparative Animal Research Laboratory

Branch Stations
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

Field Stations
10 Ames Plantation
11 Cumberland Forestry Field Station
12 Friendship Forestry Field Station
13 Highland Rim Forestry Field Station
14 Milan Field Station
15 Oak Ridge Forest and Arboretum
Eighty-Seventh
Annual Report
1974

Tennessee
Agricultural Experiment Station

Edward J. Boling .................................. President of the University
Webster Pendergrass .......................... Vice President for Agriculture
E. J. Chapman ............................... Assistant Vice President for Agriculture
John A. Ewing ..................................... Dean
D. M. Gossett ................................... Assistant Dean
T. J. Whatley ..................................... Assistant Dean

The University of Tennessee
Knoxville
LETTER OF TRANSMITTAL

Knoxville, Tennessee
January 2, 1975

To His Excellency, Ray Blanton
Governor of Tennessee

SIR: I have the honor of transmitting in accordance with the law requiring that such a report be submitted annually by the administrators of the Agricultural Experiment Station to the Governor of the State.

Respectfully submitted,
Edward J. Boling, President

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The Eighty-Seventh Annual Report
of the
Tennessee Agricultural Experiment Station
1974

Foreword

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

1) Research projects active as of December 31, 1974;
2) Research projects terminated during the calendar year 1974;
3) Bulletins, articles, and reports prepared by Experiment Station staff members and published during the calendar year 1974.

In addition, this report contains the financial statement for the Agricultural Experiment Station covering the period July 1, 1973 to June 30, 1974. Also included is a list of the Experiment Station personnel for the calendar year 1974.

Active Projects

As of December 31, 1974, there were 148 Hatch projects and 15 State 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.

In addition, there were 9 McIntire-Stennis and 6 University of Tennessee-Energy Research and Development Administration projects, and 2 CSRS 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 climatic 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.
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## FINANCIAL STATEMENT

**July 1, 1973-June 30, 1974**

The University of Tennessee Agricultural Experiment Station

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hatch Act-Amended</th>
<th>Co-op Forestry Research</th>
<th>Specific Grants</th>
<th>Non-Federal</th>
<th>Totals All</th>
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<td>Regular</td>
<td>Reg. Research</td>
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<td>Funds Available</td>
<td>$1,611,557.00</td>
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<td>Expenditures</td>
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<td>Personal Services</td>
<td>$1,480,499.83</td>
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<td>Land and Structures</td>
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<td>Personnel Benefits</td>
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<td>1,949.73</td>
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<td>All Other</td>
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<td>6,734.72</td>
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<td>Unexpended Balances*</td>
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<td>$146,378.00</td>
<td>$54,000.00</td>
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*Includes Carryover Obligations
Many of the projects involving studies of soils, crops and livestock may include experimental work at one or more of the outlying stations as well as at the Main Station at Knoxville.

**Projects Terminated**

During 1974, 50 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 17 Station Bulletins published during the year, and 1 was reprinted. The number of technical, semi-technical, and popular articles prepared by staff members published during 1974 was 167. In addition, staff members published 5 Extension-type publications, 4 regional bulletins, 2 abstracts, and 4 chapters in books.

**AGRICULTURAL BIOLOGY**

<table>
<thead>
<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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<tbody>
<tr>
<td>Hatch 98</td>
<td>Life History, Ecology, and Control of Major Cotton Insects.</td>
</tr>
<tr>
<td>Hatch 138</td>
<td>Biology, Pathogenicity, and Control of Plant Parasitic Nematodes; cooperative with the U.S. Department of Agriculture.</td>
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<tr>
<td>Hatch 139R</td>
<td>Rhizosphere Ecology as Related to Plant Health and Vigor (contributing to Regional Proj. S-90).</td>
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<tr>
<td>Hatch 299R</td>
<td>Biology and Ecology of House Dust Mites.</td>
</tr>
<tr>
<td>Hatch 302R</td>
<td>Viruses and Mycoplasma-like Organisms Causing Diseases of Corn and Sorghum.</td>
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<tr>
<td>Hatch 311</td>
<td>Biology and Control of Arthropods on Soybeans (contributing to Regional Proj. S-74).</td>
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<tr>
<td>Hatch 315</td>
<td>Nature and Extent of Variation in Root-Knot and Cyst Nematodes (contributing to Regional Proj. S-76).</td>
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<tr>
<td>Hatch 343</td>
<td>Biology and Culture of Selected Fishes.</td>
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<tr>
<td>Hatch 349</td>
<td>Catfish Breeding, Production, and Marketing (contributing to Regional Proj. S-83).</td>
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Hatch 359  Biology and Management of Insects in Yellow-Poplar Seed Orchards.
Hatch 360  Mutation Breeding Soybeans.
Hatch 395  Effect of Soil Environmental Conditions on Occurrence and Quantity of Cotton Seedling Pathogens.
Hatch 398  Biology and Control of Insect Pests of Cattle in Tennessee.
Hatch 415  Breeding Disease-Resistant Dark Tobacco.
Hatch 418  Diseases of Small Grains.
Hatch 419  Diseases of Ornamentals and Nursery Crops.
Hatch 420  Etiology and Control of Vegetable Diseases.
Hatch 421  Control of Tobacco Insects.
Hatch 423  Biology and Control of Cotton Diseases.
Hatch 431  Detection and Control of Soybean Diseases.

Projects Concluded in 1974

Hatch 132  Breeding Disease-Resistant Tobacco.
Hatch 140  Evaluating New Fungicides.
Hatch 203  Control of Insects Attacking Nursery Plants.
Hatch 213  Biology and Control of Corn Insects.
Hatch 241  Inactivation and Loss of Pesticides from Soil.
Hatch 251  Diseases of Small Grains.
Hatch 260  Diseases of Ornamentals and Associated Nursery Crops.
Hatch 263  Snapbean Diseases.
Hatch 264  Biology and Control of Tobacco Insects.
Hatch 289  Biology and Control of Cotton Diseases.
Hatch 292  Forage Crop Insect Control.

Bulletins, Articles, and Reports—1974

Chambers, A. Y.

Chambers, A. Y., C. H. Hadden, and S. Merrill
Chambers, A. Y.

Chambers, A. Y. and T. C. McCutchen

Chambers, A. Y. and T. C. McCutchen

Cherry, E. T.

Cherry, E. T.

Cherry, E. T., J. M. Bryan, and T. C. McCutchen

Hilty, J. W. and C. A. Mullins

Johnson, L. F.

Johnson, L. F.

Johnson, L. F. and A. Y. Chambers

Johnson, L. F.
Extraction of Oat Straw, Flax, and Amended Soil to Detect Substances Toxic to the Root-Knot Nematode. Phytopathology 64:1471-1473.
Johnson, W. C., E. T. Cherry, J. E. Pendergrass, and E. E. Burgess
Cotton Insect Control, 1974. University of Tennessee Agricultural
Extension Service Publication 387 (Revised) 1974.

Keener, James A. and Charles D. Pless
Effects of Direct Application of Selected Pesticides on Honey Bee
Colonies. Tennessee Farm and Home Science Progress Report 89,
March 1974.

Moody, E. H., B. F. Lownsbery, and A. L. Braun
Plant-Parasitic Nematodes in California Prune Orchards. Plant Dis-

Moody, E. H., B. F. Lownsbery, G. C. Martin, and H. I. Forde
Comparative Tolerance of Walnut Species, Walnut Hybrids, and
Wingnut to the Root-Lesion Nematode, Pratylenchus vulnus. Plant

A New Genus and Species of Gall-Forming Nematode from Dan-
thonia californica, with a Discussion of Its Life History. Nemat-

Newman, M. A. and A. Y. Chambers
Cotton Diseases and Their Control. University of Tennessee Agri-

Reed, H. E. and A. Y. Chambers
Wheat Leaf Rust (Puccinia rubigo-vera tritici). Fungicide and Nema-
ticide Tests Results of 1974, American Phytopathological Society

Reed, H. E. and A. Y. Chambers
Barley Loose Smut (Ustilago nuda). Fungicide and Nematicide Tests

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

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<tr>
<th>Proj. No.</th>
<th>Research Project Titles</th>
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</thead>
<tbody>
<tr>
<td>Hatch 283</td>
<td>Potentials of the Beef Production Industry in the South (contributing to Regional Proj. S-67).</td>
</tr>
<tr>
<td>Hatch 303</td>
<td>Regional Income and Employment Effects of Investments in Natural Resources (contributing to Regional Proj. S-71).</td>
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Hatch 312 Economic Evaluation of Alternative Forms of Vertical Coordination in the Livestock-Meat Industry (contributing to Regional Proj. SM-41).

Hatch 316 Predicted Effects of Selected Policy and Technology Changes on the Grain Marketing System (contributing to Regional Proj. SM-42).

Hatch 322 Financial Management Strategies of Farm Business Managers.

Hatch 326 Factors Affecting Utilization and Expansion Potential for Ornamental Plants and Turf (contributing to Regional Proj. SM-44).

Hatch 328 Socio-Economic Characteristics of Rural Development Areas in Tennessee.

Hatch 331 Rural Development and the Quality of Life in the Rural South (contributing to Regional Proj. S-79).

Hatch 340 Systems Analysis of the Vegetable Subsector of the Food Industry of the South (contributing to Regional Proj. SM-46).

Hatch 346 Growth of the Farm Firm in Specified Farming Regions of Tennessee.

Hatch 350 Demand for Food (contributing to Regional Proj. SM-45).

Hatch 364 Influences of Farm Supply Dealers on Technological Change by High and Low Income Tennessee Farmers.

Hatch 365 Evaluation of Vocational Training for Rural People.


Hatch 372 Types of Farming in Tennessee.

Hatch 373 Fire Prevention and Protection Services for Rural Areas of Tennessee.

Hatch 380 Contract Marketing of Cotton (contributing to Regional Proj. SM-91).

Hatch 381 Land Use, Rural-Urban Fringe Areas.

Hatch 382 The Impact of Demographic Changes of the Tennessee Rural Population.

Hatch 385 Economic, Locational, and Institutional Factors Affecting Industrial Plant Location in Nonmetropolitan Areas (contributing to Regional Proj. S-96).

Hatch 386 Feeder Cattle Pricing and Price Forecasting in Tennessee.
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Hatch 388 Social and Psychological Factors Related to Managerial Success.
Hatch 422 Present Impact and Development of the Craft Industry in Rural Tennessee.
Hatch 427 Factors Determining Costs Incurred by Feeder Pig Buyers and Dealers Utilizing Tennessee Organized Feeder Pig Sales.
Hatch 432C Alternative Systems of Swine Production.
State 74 Impact of Agricultural Public Policies on Tennessee Agriculture.

Projects Concluded in 1974

Proj. No. Research Project Titles
Hatch 285 Farm Labor in Tennessee.
Hatch 327 Delineation of Functional Economic Areas in Tennessee.

Bulletins, Articles, and Reports—1974

Badenhop, M. B. and Rodney M. Thomsen

Badenhop, M. B. and M. Dewayne Trail

Badenhop, M. B. et al.
Expenditure Patterns for Landscape Plants and Lawns by Apartment Owners in the South. Southern Cooperative Series Bulletin 184, Alabama Agricultural Experiment Station, January 1974.

Badenhop, M. B., Cecil N. Smith, and Al E. Einert

Badenhop, M. B. and Cecil N. Smith

Badenhop, M. B. and T. Morris Jones
Brooker, John R., Brady Deaton, D. Ray Humberd, and B. R. McManus
Policy Considerations for Commercial Agriculture and Rural Development. Tennessee Agricultural Experiment Station Bulletin No. 540, April 1974.

Brooker, John R.

Cleland, C. L.
Southern Regional Research in Rural Sociology During the Sixties. Reflections on the Development of Cooperative Rural Sociology Research in the South, Rural Sociology Series No. 1, Alabama Agricultural Experiment Station, April 1974.

Cuskaden, C. M.

Deaton, Brady J. and Dan Gunter

Dubov, Irving

Dubov, Irving and E. L. Rawls

Einert, A. B., L. P. Stolts, M. B. Badenhop, C. N. Smith and other members of SM-44 Technical Committee

Keller, Luther H. and Robert Ray

Keller, Luther H.
Martin, Joe A.
Agriculture Outlook, Tennessee Economic Outlook/1975—Part III.

McManus, B. R.

McManus, B. R. and Curtis Hancock, Jr.

Sanders, William L., B. R. McManus, and Robert A. Reynolds

Sappington, Charles

Sappington, Charles

Smith, Cecil N. and M. B. Badenhop

Trevena, Billy J. and Luther H. Keller

Trevena, Billy J.

AGRICULTURAL ENGINEERING

Proj. No. Research Project Titles
Hatch 204 Factors Affecting Water Yields from Small Watersheds in Tennessee; cooperative with the Plant and Soil Science Department, the UT/AEC Agricultural Research Laboratory, and the Soil Conservation Service (contributing to Regional Proj. S-53).

Hatch 294 Engineering Systems for Cotton Production (contributing to Regional Proj. S-69).
Hatch 333  Evaluation and Improvement of Low-Cost Rural Housing in Tennessee; cooperative with the Agricultural Economics Department.

Hatch 338  Reducing Labor and Costs in the Dark-Fired Tobacco Harvest-Curing Operation; cooperative with the Agricultural Biology Department.

Hatch 362  Transportation and Temporary Storage of Tennessee Vegetables Between Harvesting and Processing; cooperative with the Food Technology and Science Department.

Hatch 363  Machinery for Harvesting Fruit and Pod Vegetables; cooperative with the Food Technology and Science and Plant and Soil Science Departments.


Hatch 379  Development of Compatible Erosion-Control Practices and Machinery Systems; cooperative with the Plant and Soil Science Department and the University of Tennessee Water Resources Research Center.

Hatch 424B  Evaluation of Dairy Waste Management Systems; cooperative with the Animal Science, Agricultural Economics, and Agricultural Biology Departments.

Hatch 432B  Alternative Systems of Swine Production; cooperative with the Animal Science and Agricultural Economics Departments.

Hatch 441  Animal Waste Treatment and Recycling Systems; cooperative with the Animal Science Department (contributing to Regional Proj. S-89).

CSRS-TN-316-15-92  Optimizing Cotton Tillage; cooperative with the Plant and Soil Science Department.

State 66  Machines for Low-Cost Hay Making on Small Farms; cooperative with the Plant and Soil Science and Animal Science Departments.

**Projects Concluded in 1974**

Hatch 367R  Farm Waste Disposal; cooperative with the Animal Science Department (contributing to Regional Proj. S-89).

State 7  Electric Treatment of Plant Materials; cooperative with the Plant and Soil Science, Food Technology and Science Departments and the U.S. Department of Agriculture.

State 25  Land Forming for Drainage and Furrow Irrigation; cooperative with the Soil Conservation Service.
Bulletins, Articles, and Reports—1974

Baxter, D. O., B. J. Bearden, J. J. McDow, and J. T. Miles

Cheng, C. C. and K. E. Duckett

Cheng, C. C., J. L. White, and K. E. Duckett

Duckett, K. E. and C. C. Cheng

Duckett, K. E.

Henry, Z. A. and W. H. Allen

Lawson, Reba and K. L. Hertel

Mullins, James A., Joseph R. Overton, and Larry S. Jeffery

Mullins, James A., Joseph R. Overton, and Larry S. Jeffery

Mullins, J. A., Tom McCutchen, W. L. Parks, F. F. Bell, and Steve Parks

Ramey, H. H., Jr. and R. S. Krowicki

Ramey, H. H., Jr.

Ramey, H. H., Jr.

Sewell, John I.

Sewell, John I. and C. H. Shelton

Sewell, John I. and William H. Allen

ANIMAL SCIENCE

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<tr>
<td>Hatch 52</td>
<td>The Evaluation of Different Pasture Species in Various Combinations and at Varying Rates of Nitrogen Fertilization as Reflected in Beef Cattle Gains and Forage Yields.</td>
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<td>Hatch 61</td>
<td>The Improvement of the Producing Ability of Beef Cattle; cooperative with the Aluminum Company of America (contributing to Regional Proj. S-10).</td>
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<td>Hatch 92</td>
<td>The Effects of Maximum Selection Pressure for Milk Production on Rate of Improvement in Production and Its Effect on Other Dairy Cattle Traits (contributing to Regional Proj. S-49).</td>
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<td>Hatch 155</td>
<td>The Influence of Light Upon Performance of Domestic Chickens.</td>
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<td>Hatch 161</td>
<td>Effect of Stage of Maturity of Corn Silage at Harvest or Yield Component and Its Relation to Resulting Milk Production.</td>
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<tr>
<td>Hatch 233</td>
<td>The Nutrition of Egg-Production-Type Chickens.</td>
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<td>Hatch 268</td>
<td>The Identification and Control of Factors Affecting Reproductive Performance in the Bovine Female.</td>
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<td>Hatch 284</td>
<td>Factors Affecting the Rate of Genetic Improvement of Dairy Cattle.</td>
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<td>Hatch 297</td>
<td>Feed Requirements for Growth of Heifers.</td>
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<td>Hatch 298</td>
<td>Bovine Mammary Gland Development During Gestation and Initial Stages of Lactation.</td>
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<td>Hatch 300</td>
<td>Role of the Ultomobranchial Gland in Avian Osteoporosis.</td>
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<td>Hatch 306</td>
<td>Breeding Methods for Beef Cattle in the Southern Region; cooperative with the U.S. Department of Agriculture (contributing to Regional Proj. S-10).</td>
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<td>Hatch 307</td>
<td>Efficiency of Beef Production—Amount of Variation and Criteria for Improvement; cooperative with the U.S. Department of Agriculture.</td>
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<td>Hatch 310</td>
<td>The Relationship of Body Length to Economically Important Traits in Meat-Type Swine.</td>
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<td>Hatch 317</td>
<td>Feeding Programs for Maximum Efficiency and Optimum Body Composition.</td>
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<td>Hatch 321</td>
<td>Hypomagnesia Relationship to Grass Tetany in Ruminant Animals.</td>
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<td>Hatch 325</td>
<td>Endocrinology of Reproduction in Cattle.</td>
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<td>Hatch 342</td>
<td>The Mineral Nutrition of Egg-Production-Type Laying Hens.</td>
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<tr>
<td>Hatch 345</td>
<td>Evaluation of Beef Cow-Calf Management Systems as Measured by Production on Various Grazed and Harvested Forages.</td>
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<td>Hatch 351</td>
<td>Effect of Silage Quality on the Performance of Slaughter Animals.</td>
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<td>Hatch 371</td>
<td>Stress and Laying Hen Performance.</td>
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<td>Hatch 390</td>
<td>Micro and Macro Elements in Animals.</td>
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Hatch 432A Alternative Systems of Swine Production.
Hatch 433 Pre- and Post-Weaning Management of Beef Calves.
State 1 Random Sample Testing of Chickens Available to Tennessee Poultrymen.
State 2 Swine Testing and Evaluation.
State 3 Effects of Levels of Soil and Water on Grazing Cattle Under Different Systems of Management.
State 42 Beef Cattle Improvement.
State 59 Bull Evaluation.
State 67 Feeding Floor Systems Effects Upon Performance of Beef Animals.
State 71 Criteria for Allotment of Feeder Calves into Uniform Slaughter Outcome Groups.

Projects Concluded in 1974


Bulletins, Articles, and Reports—1974

Al-Khazraji, A. K., H. A. Al-Fayadh, and H. V. Shirley

Al-Mohammadi, S. and H. V. Shirley
The Requirements of Laying Stocks for Protein During the Laying Phase. Tennessee Farm and Home Science Progress Report 91, September 1974.

Barth, Karl M. and S. W. Coleman

Barth, Karl M., S. W. Coleman, J. A. Corrick, and P. E. Shumway

Baxter, Harold D., J. C. Derbyshire, M. J. Montgomery, and J. R. Owen
Bell, Marvin Carl and W. F. Byrne  

Bell, Marvin Carl and W. F. Byrne  

Dowlen, Henry H., D. B. Batson, R. L. Murphree, and D. O. Richardson  
Progesterone Levels in Cows Suspected of Embryonic Mortality. 

Jones, J. E., K. M. Barth, and S. W. Coleman  

Mascola, Joseph J., Karl M. Barth, and James B. McLaren  

Masincupp, Frank B.  

Masincupp, Frank B. and Calvin F. Prince, Jr.  

Montgomery, Monty J., H. A. Fribourg, W. M. Hopper, and J. R. Overton  

Moore, Ed D., H. H. Dowlen, J. R. Owen, and D. O. Richardson  

Moore, Ed D., H. H. Dowlen, S. L. Hansard, J. R. Owen, and D. O. Richardson  

Moore, Ed D., H. H. Dowlen, and J. R. Owen  

Moore, Ed D., S. E. Bennett, H. H. Dowlen, L. D. Haws, J. R. Owen, and D. O. Richardson  

Neel, J. B., J. A. Corrick, Jr., and W. T. Butts, Jr.  
Tebong, Emmanuel and H. V. Shirley

Tracy, James, Jr., J. B. McLaren, and James O'Neal

Shirley, H. V.

Shirley, H. V.

Shrode, Robert R.

Swanson, Eric W. and Eitard Imaizumi

**CHILD AND FAMILY STUDIES**

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<th>Proj. No.</th>
<th>Research Project Titles</th>
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<td>Hatch 265</td>
<td>Influences on Occupa-</td>
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<td>tional Goals of Young</td>
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**Projects Concluded in 1974**

Hatch 265 Influences on Occupational Goals of Young People.

**Bulletins, Articles, and Reports—1974**

FOOD SCIENCE, NUTRITION, AND FOOD SYSTEMS ADMINISTRATION

**Proj. No.** Research Project Titles
Hatch 314 The Effect of Nutrition on Biology Aging in the Rat.
Hatch 353 Non-Oxidative Reactions of Meat Lipids During Heating and Their Relations to Cooked Meat Quality.
Hatch 355 Effect of Sulfur on Neutral Sulfur Metabolism.
Hatch 361 Chemical and Physical Characteristics of Muscle Foods as Affected by Heating and Freezing.
Hatch 384 Patterns of Food Intake and Nutritional Health of Girls.
Hatch 396 Effect of Stress on Sulfur Metabolism.

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Carruth, K. B. and J. T. Smith

Smith, J. T. and R. S. Verma

Tucker, S. M., R. L. Mason and R. E. Beauchene

Whittle, B. and J. T. Smith

**FOOD TECHNOLOGY AND SCIENCE**

**Proj. No.** Research Project Titles
Hatch 173R Enterococci in Nonsterile Foods.
Hatch 193 Enzymes as Related to Chemical and Physical Characteristics of Vegetables for Freezing.
Hatch 282R Studies on the "Lacks Freshness" Flavor of Cottage Cheese.
Hatch 356 Development of a Product Prototype for the Utilization of Cottage Cheese Whey.
Hatch 374 Development and Improvement of Vegetable Products and Processing; Quality Factors of Cultivars.
Hatch 375  Fibrous Protein from Cheese Whey.
Hatch 376  Food Color Identification, Notation and Amelioration with Natural Compounds.
Hatch 387  Combined Enzymatic-Extraction Procedure for Protein Recovery from Selected Crops and Food Wastes.
Hatch 389  Toxigenic Fungi Evaluation of Selected Crops.
Hatch 391  Quality and Shelf Life of Food Products in the Marketing Channels.
Hatch 393  Flavor Precursors in Protein Concentrates and Isolates.
Hatch 394  Histological and Histochemical Relationships of Muscle to Meat Quality and Cutability.
Hatch 397  Characterization and Treatment of Tennessee Food Processing Wastes.
State 73  Pesticides in/on Raw and Processed Foods.

Projects Concluded in 1974

Hatch 165  Quality and Shelf Life of Dairy Products in the Marketing Channels.
Hatch 257  Effects of Levels of Fatness on Beef Carcass Quality; cooperative with the U.S. Department of Agriculture.
Hatch 305  Fortification of Milk with Iron.
Hatch 344  Use of Slaughter-By-Products and Extenders in Sausage Manufacturing.
Hatch 378  Processing Wild Game and Fish.

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Demott, B. J. and J. R. Park

Eisele, G. R., F. R. Mraz, and M. R. Johnston
Jaynes, H. O. and C. T. Chiang  

Mundt, J. Orvin, Reba K. Hendren, and David L. Coffey  


Roop, Dennis R., J. Orvin Mundt, and W. Stuart Riggsby  

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MS 12R Ecology of Mammalian Species of the Great Smoky Mountains National Park.

MS 14 Effect of Seedling Root Deformation on Growth and Allocation of Auxins.

MS 16 Economic Importance of Tennessee Forest Resources and Wood Products Industries.

State 30 The University of Tennessee Arboretum.

State 63 The Ecological and Economic Implications of Improving Wildlife Habitat on Farms in Tennessee.

State 70 Forest Cutting and Water Yield; cooperative with the Agricultural Engineering Department.

State 72 Competitive Position of and Practices in the Hardwood Dimension Industry; cooperative with the Industrial Management Department.

Projects Concluded in 1974

MS 11 Physiological Response of Wildlife to Different Forest and Associated Habitats.

MS 13 Characteristics of Campers in Forest Recreation Areas in Tennessee.

State 53 Quality and Yield of Flooring from Graded Red Oak; cooperative with the U.S. Department of Agriculture.

State 61 Forest Response to Management Intensities.

Bulletins, Articles, and Reports—1974

Beeman, Larry E. and Michael R. Pelton

Beeman, Larry E., Michael R. Pelton, and Larry C. Marcum

Buckner, Edward R. and E. Thor

Dimmick, Ralph W.
Eagar, Daniel C. and Steve Stafford  

Eubanks, Thomas R. and Ralph W. Dimmick  

Hay, Ronald L. and Frank W. Woods  

Hay, Ronald L. and Frank W. Woods  

Marcum, Larry C., Michael R. Pelton, and Larry E. Beeman  

Minser, William G. III  

Minser, William G. III and J. M. Dabney  

Minser, William G. III  

Nichols, Robert G. and Michael R. Pelton  

Pelton, Michael R., Charles D. Scott, and Gordon M. Burghardt  

Rennie, J. C. and E. E. Birth  
Rennie, J. C.

Rink, George and E. Thor

Thor, E., George Rink, and W. T. Plass

Thor, E. and P. E. Barnett

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Thor, E. and G. M. Nichols

Welborn, Thomas C.

Wells, G. R. and J. M. Earles

Wells, G. R., Arnold Hedlund, and J. M. Earles

Woods, Frank W. and L. Barden

Woods, Frank W. and W. T. Lawhon
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Hatch 377 | Production Systems of Nursery Stock.
Hatch 392 | Mutation Breeding in Vegetatively Propagated Flowering Pot Plants and Garden Perennials.
Hatch 425 | Pesticide Evaluations, Their Residual Effects and Phytoxicity in Turfgrasses.
Hatch 426 | Cultural and Mechanical Management and Evaluation of Turfgrasses.
Hatch 429 | Chemical Control of Plant Growth in Florist Pot Plants and Bedding Plants.

**Projects Concluded in 1974**

Hatch 47 | The Management and Evaluation of Turfgrasses.
Hatch 154 | Kind and Variety Investigations of Ornamentals.
Hatch 245 | Effects of Pesticides on Turf Pests and Turfgrasses.
Hatch 319 | Methods of Mutagenesis to Produce Morphological Changes in Plant and Fruit in Tomato and Snap Bean.

**Bulletins, Articles, and Reports—1974**

Callahan, Lloyd M.

Callahan, Lloyd M.

PLANT AND SOIL SCIENCE

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Hatch 186 | Forage Crops Management; Establishment, Persistence, and Productivity.
Hatch 211 | Forage Crop Breeding.
Hatch 256  Burley Tobacco Breeding.
Hatch 301  Viruses and Mycoplasma-Like Organisms Causing Diseases of Corn and Sorghum.
Hatch 320  Weed Control in Agronomic Crops.
Hatch 335  Herbicide Movement from Application Sites and Effects on Non-Target Species (contributing to Regional Proj. S-78).
Hatch 337  Diagnosis and Correction of Zinc Problems in Corn and Rice Production (contributing to Regional Proj. S-80).
Hatch 341  Fertilizers and Organic Wastes Applied to Soils in Relation to Environmental Quality (contributing to Regional Proj. S-82); cooperative with the Agricultural Engineering Department.
Hatch 352  Weed Control in Horticultural Crops.
Hatch 360  Mutation Breeding of Soybeans; cooperative with the Agricultural Biology Department.
Hatch 399  Soil and Plant Nutrient Status and Environmental Factors in Relation to Crop Yields.
Hatch 400  Effect of Plant Environment on Its Photosynthetic Capability.
Hatch 402  Cotton Seed and Fiber Development.
Hatch 403  Cotton Production and Varietal Adaptation.
Hatch 404  Forage Crop Production and Metabolic Patterns Under Different Management and Environmental Conditions.
Hatch 406  Small Grain Improvement Through Breeding (Wheat, Oats, Barley, Rye).
Hatch 407  Selectivity and Mode of Action of Herbicides and Antidotes.
Hatch 408  Corn Improvement.
Hatch 409  Development and Evaluation of Rootstocks for Peach (contributing to Regional Proj. S-97).
Hatch 411  Vegetable Crop Production.
Hatch 412  Interfacial Reactions in Soils.
Hatch 413  Liming and Its Effects on Nutrient Availability.
Hatch 414  Field Crop Variety Evaluation.
Hatch 416  Plant Growth Regulator Effects on Fruit, Vegetable and Agronomic Crops.
Hatch 417  Fruit Crop Investigations.

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Hatch 250  Influence of Mineralogy of Southern Soils on Certain Chemical and Physical Reactions.

Hatch 279  Selectivity and Mode of Action of Herbicides.

Hatch 280  Remote Multispectral Sensing in Agriculture; cooperative with the Agricultural Biology, Agricultural Engineering, and Forestry Departments.

Hatch 287  Effectiveness and Efficiency of Physical and Chemical Mutagens; cooperative with UT-ERDA Comparative Animal Research Laboratory.

Hatch 291  Plant Constituents Controlling Cotton Fiber Initiation, Growth and Maturation; cooperative with the U.S. Department of Agriculture.

Hatch 332  Growth Regulation of Vegetable Crops.

State  60  Soybean Production Potentials and Production Economics of Some Major Tennessee Soils.

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UT—COMPARATIVE ANIMAL RESEARCH LABORATORY

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Killion, D. D. and M. J. Constantin

Mailhes, J. B. and A. F. McFee

McFee, A. F., M. W. Banner, and Mary N. Sherrill

Miller, J. K., E. W. Swanson, W. A. Lyke, B. R. Moss, and W. F. Byrne
Miller, J. K., E. W. Swanson, G. E. Spalding, W. A. Lyke, and R. F. Hall


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**THE UNIVERSITY OF TENNESSEE AT MARTIN**
**AGRICULTURE DEPARTMENT**

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STATION PERSONNEL—1974

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Agricultural Experiment Station
Knoxville, Tennessee 37901

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1'In cooperation with the U.S. Department of Agriculture.
In cooperation with the U.S. Department of Agriculture.
EIGHTY-SEVENTH ANNUAL REPORT

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T. B. Turner, Graduate Research Assistant
J. E. Wilkinson, Graduate Research Assistant

CHILD AND FAMILY STUDIES

Judith L. Kuipers, Head of Department
Helen Reed, Assistant Professor
Lois E. Southworth, Instructor

FOOD SCIENCE, NUTRITION, AND FOOD SYSTEMS ADMINISTRATION

Mary Rose Gram, Head of Department
Mia M. Armitage, Graduate Research Assistant
Roy E. Beauchene, Professor
Ada M. Campbell, Professor
Gail W. Disney, Assistant Professor
Janet S. Kurzynske, Graduate Research Assistant
Rossie L. Mason, Assistant Professor
Marjorie P. Penfield, Assistant Professor
Doris E. Phillips, Graduate Research Assistant
John T. Smith, Professor
Martha B. Stone, Graduate Research Assistant
Verdis L. Taylor, Graduate Research Assistant
Elizabeth A. Yetley, Assistant Professor

FOOD TECHNOLOGY AND SCIENCE

J. T. Miles, Head of Department
H. N. Carringer, Creamery Manager
E. A. Childs, Assistant Professor
J. L. Collins, Associate Professor
B. J. Demott, Associate Professor
F. A. Draughon, Graduate Research Assistant
C. S. Gaines, Graduate Research Assistant
H. O. Jaynes, Associate Professor
J. C. Harrison, Graduate Research Assistant
J. E. Marcy, Graduate Research Assistant
C. C. Melton, Associate Professor

1In cooperation with the U.S. Department of Agriculture.
S. L. Melton, Assistant Professor
R. E. Moyers, Graduate Research Assistant
J. O. Mundt, Professor
W. W. Overcast, Professor
J. S. Pretanik, Graduate Research Assistant
O. G. Sanders, Graduate Research Assistant
C. J. Wilmes, Graduate Research Assistant

FORESTRY

J. W. Barrett, Head of Department
B. F. Anderson, Graduate Research Assistant
E. R. Buckner, Associate Professor
D. K. Burt, Graduate Research Assistant
H. Cabrera, Graduate Research Assistant
H. A. Core, Professor
R. W. Dimmick, Associate Professor
D. C. Eagar, Graduate Research Assistant
W. R. Gall, Graduate Research Assistant
P. D. Johnson, Graduate Research Assistant
L. F. Jones, Graduate Research Assistant
K. R. Livengood, Graduate Research Assistant
W. H. McCracken, Graduate Research Assistant
W. G. Minser III, Instructor
W. W. Moschler, Instructor
D. M. Ostermeier, Assistant Professor
M. R. Pelton, Associate Professor
Vivian O. Potter, Graduate Research Assistant
J. C. Rennie, Assistant Professor
J. L. Richeson, Graduate Assistant
K. F. Schell, Associate Professor
Daryl A. Taylor, Graduate Research Assistant
E. Thor, Professor
G. R. Wells, Assistant Professor
F. W. Woods, Professor

ORNAMENTAL HORTICULTURE AND LANDSCAPE DESIGN

D. B. Williams, Head of Department
J. S. Alexander, Associate Professor
L. M. Callahan, Associate Professor
L. Bassano, Graduate Research Assistant
E. T. Graham, Associate Professor
J. M. Holt, Research Assistant
D. Ingram, Graduate Research Assistant
G. L. McDaniel, Assistant Professor
S. Street, Graduate Research Assistant
H. van de Werken, Associate Professor

PLANT AND SOIL SCIENCE PERSONNEL

L. F. Seatz, Head of Department
M. B. Akins, Graduate Research Assistant
W. D. Barber, Assistant Professor
F. F. Bell, Professor
J. F. Brown, Assistant Professor, Jackson
G. J. Buntley, Associate Professor

¹In cooperation with the U.S. Department of Agriculture.
D. L. Coffey, Associate Professor
B. V. Conger*, Associate Professor, Oak Ridge
J. T. Connell, Assistant Professor, Grand Junction
M. B. Donoho, Graduate Research Assistant
H. A. Fribourg, Professor
C. R. Graves, Associate Professor
C. L. Gupton*, Associate Professor, Greeneville
D. B. Hannaway, Graduate Research Assistant
B. G. Harville, Graduate Research Assistant
P. E. Hoskinson, Associate Professor, Jackson
J. S. Jeffery, Assistant Professor
L. M. Josephson, Professor
H. C. Kinser, Assistant Professor
W. A. Krueger, Assistant Professor
G. M. Lessman, Assistant Professor
R. J. Lewis, Associate Professor
D. W. Lockwood, Assistant Professor
R. W. Loveland, Graduate Research Assistant
A. R. McDaniel, Graduate Research Assistant
W. Miller, Graduate Research Assistant
T. H. Morgan, Jr., Assistant Professor, Spring Hill

T. E. Morgan, Graduate Research Assistant
S. L. Morris, Graduate Research Assistant
C. A. Mullins, Assistant Professor, Crossville
B. C. Nichols*, Associate Professor, Greeneville
J. R. Overton, Associate Professor, Jackson
W. L. Parks, Professor
D. L. Reasons, Graduate Research Assistant
V. H. Reich, Assistant Professor
J. H. Reynolds, Associate Professor
L. D. Robertson, Graduate Research Assistant
R. H. Rogers, Graduate Research Assistant
C. E. Sams, Graduate Research Assistant
J. B. Sikes, Jr., Graduate Research Assistant
L. W. Skinner, Graduate Research Assistant
L. N. Skold, Professor
H. C. Smith, Associate Professor
M. E. Springer, Professor
J. M. Stewart*, Assistant Professor
H. D. Swingle, Professor
J. Turner*, Associate Professor
S. Worley*, Associate Professor

**TEXTILES AND CLOTHING**

Anna Jean Treece, Head of Department
Carolyn T. Ashley, Graduate Research Assistant
Joan Bare, Graduate Research Assistant

**UT—COMPARATIVE ANIMAL RESEARCH LABORATORY**

H. E. Walburg, Laboratory Director
D. M. Robie, Administrative Assistant

J. M. Bird, Superintendent
B. V. Conger*, Associate Professor
M. J. Constantin, Professor

*In cooperation with the U.S. Department of Agriculture.

*In cooperation with the UT-Comparative Animal Research Laboratory.
THE UNIVERSITY OF TENNESSEE AT MARTIN
AGRICULTURE DEPARTMENT

H. J. Smith, Dean, School of Agriculture
B. R. Hathcock, Associate Professor of Agronomy
E. W. Culvahouse, Associate Professor of Dairying
H. A. Henderson, Farm Manager
B. N. Duck, Assistant Dean and Professor of Agronomy
N. W. Robinson, Professor of Animal Science

MAIN STATION, KNOXVILLE
J. N. Odom, Superintendent of Farms

BRANCH STATIONS

Dairy Experiment Station¹, Lewisburg, J. R. Owen, Superintendent
Plateau Experiment Station, Crossville, R. D. Freeland, Superintendent; R. Q. Snider, Manager
Highland Rim Experiment Station, Springfield, L. M. Safley, Superintendent
Tobacco Experiment Station¹, Greeneville, Donald D. Howard, Superintendent
Middle Tennessee Experiment Station, Spring Hill, J. W. High, Jr., Superintendent
West Tennessee Experiment Station, Jackson, H. W. Luck, Superintendent

FIELD STATIONS

Ames Plantation, Grand Junction, James M. Bryan, Superintendent
Milan Field Station, Milan, T. C. McCutchen, Superintendent
Forestry Field Stations at Tullahoma, Wartburg, and Oak Ridge, Richard M. Evans, Superintendent

¹In cooperation with the U.S. Department of Agriculture.
PERSONNEL CHANGES
APPOINTMENTS

Laurel M. Adams, Research Assistant in UT-Comparative Animal Research Laboratory, December 9, 1974
B. F. Anderson, Graduate Research Assistant in Forestry, January 1, 1974
David D. Asbridge, Graduate Research Assistant in Agricultural Economics, January 1, 1974
Gayle F. Bailey, Graduate Research Assistant in Agricultural Biology, September 16, 1974
Roger G. Carpenter, Graduate Research Assistant in Agricultural Engineering, September 9, 1974
Robert J. Cox, Graduate Research Assistant in Agricultural Biology, September 1, 1974
William T. Coyle, Graduate Research Assistant in Agricultural Economics, September 16, 1974
John M. Devine, Graduate Research Assistant in Agricultural Economics, July 1, 1974
M. B. Donoho, Graduate Research Assistant in Plant and Soil Science, September 20, 1974
F. A. Draughon, Graduate Research Assistant in Food Technology and Science, August 1, 1974
D. C. Eagar, Graduate Research Assistant in Forestry, March 18, 1974
F. D. Elizer, Graduate Research Assistant in Forestry, January 1, 1974
Carolyn J. Ellis, Editor, UT-Comparative Animal Research Laboratory, August 1, 1974
Terry M. Estes, Graduate Research Assistant in Animal Science, September 1, 1974

John R. Evans, Graduate Research Assistant in Agricultural Biology, September 20, 1974
W. R. Gall, Graduate Research Assistant in Forestry, January 1, 1974
Justin L. Garrett, Graduate Research Assistant in Agricultural Economics, September 9, 1974
J. C. Harrison, Graduate Research Assistant in Food Technology and Science, September 16, 1974
Jeffery Herr, Graduate Research Assistant in Animal Science, September 9, 1974
Timothy D. Hewitt, Graduate Research Assistant in Agricultural Economics, September 18, 1974
Hardin A. Hutsell, Graduate Research Assistant in Agricultural Economics, September 26, 1974
D. Ingram, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, July 1, 1974
Robert Ingram, Graduate Research Assistant in Animal Science, September 16, 1974
P. D. Johnson, Graduate Research Assistant in Forestry, September 16, 1974
Ronald R. Johnson, Head, Animal Science Department, June 17, 1974
L. F. Jones, Graduate Research Assistant in Forestry, September 16, 1974
Bruce J. Kelman, Postdoctoral Research Associate, UT-Comparative Animal Research Laboratory, September 9, 1974
Thomas H. Klindt, Assistant Professor of Agricultural Economics, August 12, 1974

1In cooperation with the U.S. Department of Agriculture.
Nancy B. Kuemmerle, Senior Research Assistant, UT-Comparative Animal Research Laboratory, October 1, 1974
Judith L. Kuipers, Head, Child and Family Studies Department, September 1, 1974
Paris L. Lambdin, Assistant Professor of Agricultural Biology, October 18, 1974
Gary L. Lentz, Assistant Professor of Agricultural Biology, August 1, 1974
K. R. Livengood, Graduate Research Assistant in Forestry, September 16, 1974
Nancy L. Lovro, Research Technician in UT-Comparative Animal Research Laboratory, December 2, 1974
J. E. Marcy, Graduate Research Assistant in Food Technology and Science, August 1, 1974
John R. McCurley, Graduate Research Assistant in Animal Science, September 1, 1974
Joseph K. McDonald, Graduate Research Assistant in Agricultural Engineering, June 10, 1974
Eugene H. Moody, Assistant Professor of Agricultural Biology, November 1, 1974
T. E. Morgan, Graduate Research Assistant in Plant and Soil Science, September 17, 1974
S. L. Morris, Graduate Research Assistant in Plant and Soil Science, September 1, 1974
R. E. Moyers, Graduate Research Assistant in Food Technology and Science, August 19, 1974
James W. Mullins, Graduate Research Assistant in Agricultural Biology, June 10, 1974

Marjorie P. Penfield, Assistant Professor in Food Science, Nutrition, and Food Systems Administration, July 15, 1974
Doris E. Phillips, Graduate Research Assistant in Food Science and Food Systems Administration, March 16, 1974
Robert S. Pile, Graduate Research Assistant in Agricultural Engineering, June 1, 1974
William D. Pitt, Jr., Graduate Research Assistant in Agricultural Economics, September 18, 1974
Jeanette I. Poffenbarger, Graduate Research Assistant in Animal Science, September 23, 1974
Vivian O. Potter, Graduate Research Assistant in Forestry, September 16, 1974
D. L. Reasons, Graduate Research Assistant in Plant and Soil Science, September 16, 1974
Jerome Reece, Graduate Research Assistant in Agricultural Economics, September 1, 1974
L. D. Robertson, Graduate Research Assistant in Plant and Soil Science, September 16, 1974
Judith B. Robinion, Senior Research Technician, UT-Comparative Animal Research Laboratory, October 1, 1974
C. E. Sams, Graduate Research Assistant in Plant and Soil Science, September 1, 1974
O. G. Sanders, Graduate Research Assistant in Food Technology and Science, January 1, 1974
Alfred E. Sculthorpe, Assistant Supervisor, UT-Comparative Animal Research Laboratory, November 25, 1974
John D. Simmons, Graduate Research Assistant in Agricultural Engineering, January 1, 1974

*In cooperation with the U.S. Department of Agriculture.*
Martha B. Stone, Graduate Research Assistant in Food Science and Food Systems Administration, January 1, 1974
S. Street, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, July 1, 1974
John E. Temple, Graduate Research Assistant in Agricultural Engineering, September 1, 1974
Fred D. Tompkins, Assistant Professor of Agricultural Engineering, September 1, 1974
Kenneth M. Wallace, Applied Health Physicist, UT-Comparative Animal Research Laboratory, November 1, 1974
Melvin L. Warren, Jr., Graduate Research Assistant in Agricultural Biology, March 20, 1974
Larry K. West, Senior Research Assistant, UT-Comparative Animal Research Laboratory, October 1, 1974
John E. Wilkinson, Graduate Research Assistant in Animal Science, September 16, 1974
C. J. Wilmes, Graduate Research Assistant in Food Technology and Science, September 19, 1974
Wei-O V. Wong, Biostatistician/Programmer, UT-Comparative Animal Research Laboratory, May 1, 1974
William B. Wyatt, Graduate Research Assistant in Agricultural Biology, September 16, 1974
Elizabeth A. Yetley, Assistant Professor in Food Science, Nutrition, and Food Systems Administration, March 25, 1974

TITLE CHANGES

J. A. Bacon, to Instructor of Animal Science, February 1, 1974
C. M. Cuskaden, to Associate Professor, Agricultural Economics and Rural Sociology Department, July 1, 1974
S. L. Hansard, to Professor, UT-Comparative Animal Research Laboratory, July 1, 1974
Donald D. Howard, from Associate Professor, Extension Plant and Soil Science, to Superintendent1, Tobacco Experiment Station1, Greeneville, September 1, 1974
H. O. Jaynes, to Associate Professor, Food Technology and Science Department, July 1, 1974
Frank O. Leuthold, to Professor, Agricultural Economics and Rural Sociology Department, July 1, 1974
C. C. Melton, to Associate Professor, Food Technology and Science Department, July 1, 1974
S. L. Melton, to Assistant Professor, Food Technology and Science Department, January 1, 1974
J. K. Miller, to Associate Professor, UT-Comparative Animal Research Laboratory, July 1, 1974
James A. Mullins, to Professor, Agricultural Engineering Department, July 1, 1974
Conrad A. Reinhardt, to Associate Professor, Agricultural Communications Department, July 1, 1974
Carroll J. Southards, to Head, Agricultural Biology Department, April 1, 1974

1In cooperation with the U.S. Department of Agriculture.
TERMINATIONS

John L. Adrian, Graduate Research Assistant in Agricultural Economics, July 9, 1974
Carolyn T. Ashley, Graduate Research Assistant in Textiles and Clothing, September 1, 1974
S. P. Bertsch, Assistant in Animal Science, January 28, 1974
J. O. Best, Graduate Research Assistant in Plant and Soil Science, December 31, 1974
B. B. Bradley, Graduate Research Assistant in Agricultural Engineering, August 9, 1974
Robert W. Burney, Graduate Research Assistant in Agricultural Economics, August 13, 1974
Thomas W. Cate, Graduate Research Assistant in Agricultural Engineering, October 2, 1974
J. M. Dabney, Graduate Research Assistant in Forestry, August 31, 1974
D. C. Daugherty, Graduate Research Assistant in Food Technology and Science, July 1, 1974
F. D. Elizer, Graduate Research Assistant in Forestry, November 11, 1974
Marion D. Ellis, Graduate Research Assistant in Agricultural Biology, September 13, 1974
William H. Foust, Graduate Research Assistant in Agricultural Economics, March 9, 1974
Mark Halcomb, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, September 13, 1974
William P. Hawkins, Graduate Research Assistant in Agricultural Engineering, September 1, 1974
Margaret L. Hedrick, Graduate Research Assistant in Agricultural Biology, June 30, 1974
T. M. Henson, Graduate Research Assistant in Forestry, August 31, 1974
Hardin A. Hutsell, Graduate Research Assistant in Agricultural Economics, December 31, 1974
A. W. Jackson, Graduate Research Assistant in Plant and Soil Science, April 30, 1974
Donald F. Johnson, Jr., Professor, UT-Comparative Animal Research Laboratory, June 30, 1974
T. Morris Jones, Graduate Research Assistant in Agricultural Economics, August 27, 1974
Donald D. Killion, Assistant Professor, UT-Comparative Animal Research Laboratory, November 22, 1974
Thomas E. Knight, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, September 30, 1974
Lavone Lambert, Graduate Research Assistant in Agricultural Biology, December 31, 1974
S. D. Livingston, Graduate Research Assistant in Plant and Soil Science, June 14, 1974
L. C. Marcum, Graduate Research Assistant in Forestry, March 15, 1974
Gary D. Miller, Graduate Research Assistant in Agricultural Engineering, September 6, 1974
Mitzi G. Miller, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, June 30, 1974

1In cooperation with the U.S. Department of Agriculture.
R. E. Morrow, Graduate Research Assistant in Animal Science, August 16, 1974
J. D. Parks, Graduate Research Assistant in Food Technology and Science, May 1, 1974
Robert S. Pile, Graduate Research Assistant in Agricultural Engineering, November 20, 1974
George Rink, Assistant in Forestry, September 13, 1974
Constance Rowland, Graduate Research Assistant in Textiles and Clothing, September 1, 1974
J. M. Safley, Jr., Graduate Research Assistant in Plant and Soil Science, June 30, 1974
C. W. Smith, Graduate Research Assistant in Plant and Soil Science, September 30, 1974
George F. Smith, Graduate Research Assistant in Agricultural Economics, July 1, 1974

John K. Springer, Graduate Research Assistant in Agricultural Economics, March 16, 1974
David L. Stoddard, Assistant Professor, UT-Comparative Animal Research Laboratory, August 31, 1974
W. Larry Vick, Assistant Professor of Agricultural Engineering, May 1, 1974
Ronald D. Weddel, Graduate Research Assistant in Agricultural Economics, August 9, 1974
John L. West, Professor, UT-Comparative Animal Research Laboratory, August 7, 1974
M. W. Yankee, Graduate Research Assistant in Plant and Soil Science, September 31, 1974

TRANSFER
James A. Bacon, Jr., Instructor, from UT-Comparative Animal Research Laboratory to Animal Science Department, February 1, 1974

RETURNED FROM LEAVE
Milton J. Constantine, Professor, UT-Comparative Animal Research Laboratory, August 29, 1974

RETIREMENTS
J. Hugh Felts, Superintendent1, Tobacco Experiment Station, Greeneville, August 31, 1974
S. Fletcher Sweet, Head of the Agricultural Communications Department, December 31, 1974 (appointed October 1, 1973)

DECEASED
Stelmon E. Bennett, Head of the Agricultural Biology Department, February 25, 1974
Bernadine Helen Meyer, Professor, Food Science and Food Systems Administration Department, June 5, 1974
Leo J. Hardin, Retired Associate Professor, Plant and Soil Science Department, January 10, 1974

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