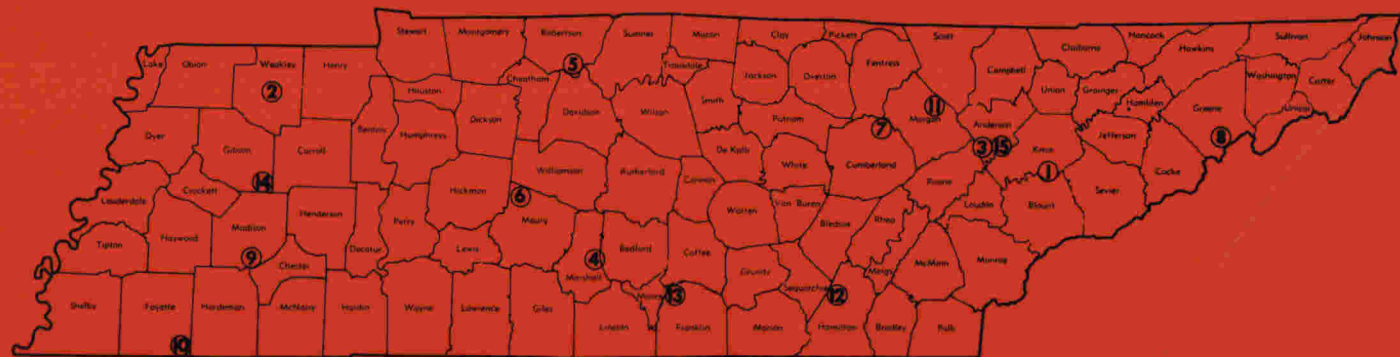


Eighty-Seventh
Annual Report
of the
Tennessee Agricultural
Experiment Station
1974

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

CONTENTS

	Page
Foreword	3
Active Projects	3
Financial Statement	4
Projects Terminated	5
Publications	5
Agricultural Biology	5
Agricultural Economics and Rural Sociology	8
Agricultural Engineering	12
Animal Science	15
Child and Family Studies	19
Food Science, Nutrition, and Food Systems Administration	20
Food Technology and Science	20
Forestry	22
Ornamental Horticulture and Landscape Design	26
Plant and Soil Science	26
Textiles and Clothing	34
UT-Comparative Animal Research Laboratory	34
University of Tennessee at Martin—Agriculture Department	36
Station Personnel	37
Personnel Changes	44

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.

EIGHTY-SEVENTH ANNUAL REPORT
FINANCIAL STATEMENT
July 1, 1973-June 30, 1974
The University of Tennessee Agricultural Experiment Station

Activity	Federal			Specific Grants	Non-Federal	Totals All
	Hatch Regular	Act-Amended Reg. Research	Co-op Forestry Research			
Funds Available	\$1,611,557.00	\$320,096.00	\$146,378.00	\$54,000.00	\$5,696,780.03	\$7,828,811.03
Expenditures						
Personal Services	\$1,480,499.83	\$292,354.99	\$ 98,470.08	\$26,176.42	\$1,775,461.37	\$3,672,962.69
Travel	7,598.14	1,947.68	871.30	640.32	84,124.53	95,181.97
Equipment	98,700.60	14,283.94	30,504.11	10,622.31	747,973.09	902,084.05
Land and Structures						
Personnel Benefits				1,949.73	564,332.17	566,281.90
All Other	24,758.43	11,509.39	6,734.72	3,185.90	1,956,247.65	2,002,436.09
Unexpended Balances*			9,797.79	11,425.32	568,641.22	589,864.33
Totals	\$1,611,557.00	\$320,096.00	\$146,378.00	\$54,000.00	\$5,696,780.03	\$7,828,811.03

*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

Proj. No.	Research Project Titles
Hatch 98	Life History, Ecology, and Control of Major Cotton Insects.
Hatch 138	Biology, Pathogenicity, and Control of Plant Parasitic Nematodes; cooperative with the U.S. Department of Agriculture.
Hatch 139R	Rhizosphere Ecology as Related to Plant Health and Vigor (contributing to Regional Proj. S-90).
Hatch 299R	Biology and Ecology of House Dust Mites.
Hatch 302R	Viruses and Mycoplasma-like Organisms Causing Diseases of Corn and Sorghum.
Hatch 311	Biology and Control of Arthropods on Soybeans (contributing to Regional Proj. S-74).
Hatch 315	Nature and Extent of Variation in Root-Knot and Cyst Nematodes (contributing to Regional Proj. S-76).
CSRS-TN- 316-15-44	Research on Boll Weevil to Support a Pest Management Program on Cotton.
Hatch 343	Biology and Culture of Selected Fishes.
Hatch 349	Catfish Breeding, Production, and Marketing (contributing to Regional Proj. S-83).

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.

Southern Blight Control in Pepper with Soil Fungicides. Tennessee Farm and Home Science Progress Report 89, March 1974.

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

Control of White Rust of Spinach with Fungicides. Tennessee Farm and Home Science Progress Report 90, June 1974.

Chambers, A. Y.

Lima Bean (*Phaseolus lunatus*) Stem Anthracnose; *Collectotrichum truncatum*. Fungicide and Nematicide Tests Results of 1974, American Phytopathological Society 29:99-100, 1974.

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

Observations and Research on Cotton Boll Rot in 1973. Proceedings: 1974 Beltwide Cotton Production Research Conferences, p. 11.

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

Field Evaluation of Soil Fungicide Treatment in Later Plantings of Cotton. Proceedings: 1974 Beltwide Cotton Production Research Conferences, pp. 26-28.

Cherry, E. T.

Effect of Plant Bugs on Cotton in West Tennessee. Tennessee Farm and Home Science Progress Report 90, June 1974.

Cherry, E. T.

Monitoring Boll Weevil Movement with Pheromone Traps. Tennessee Farm and Home Science Progress Report 90, June 1974.

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

Boll Weevil Management Studies. Tennessee Farm and Home Science Progress Report 90, June 1974.

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

Chemical Control of Snapbean Rust. Fungicide and Nematicide Tests Results of 1974, American Phytopathological Society 30:60.

Johnson, L. F.

Methods of Studying Soil Microorganisms. In (G. C. Papvizas, Ed.) The Relation of Soil Microorganisms to Soilborne Plant Pathogens. Southern Cooperative Series Bulletin 183, Virginia Polytechnic and State University, pp. 3-6, 1974.

Johnson, L. F.

Effect of Organic Amendments on Nematodes. In (G. C. Papvizas, Ed.) The Relation of Soil Microorganisms to Soilborne Plant Pathogens. Southern Cooperative Series Bulletin 183, Virginia Polytechnic and State University, pp. 31-33, 1974.

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

Isolation and Identification of Three Species of *Phythium* That Cause Cotton Seedling Blight. Proceedings: 1974 Beltwide Cotton Production Research Conferences, p. 10.

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 Di-
sease Reporter 58(7):633-636, 1974.
- 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
Disease Reporter 58(7)630-633, 1974.
- Moody, E. H., G. A. Paxman, A. R. Maggenti, and W. H. Hart
A New Genus and Species of Gall-Forming Nematode from *Dan-
thonia californica*, with a Discussion of Its Life History. Nematol-
ogica 19(4):491-497, 1974.
- Newman, M. A. and A. Y. Chambers
Cotton Diseases and Their Control. University of Tennessee Agri-
cultural Extension Service Publication E. C. 809 (Revised), 1974.
- 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
30:109, 1974.
- Reed, H. E. and A. Y. Chambers
Barley Loose Smut (*Ustilago nuda*). Fungicide and Nematicide Tests
Results of 1974, American Phytopathological Society 30:130, 1974.

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Proj. No.	Research Project Titles
Hatch 283	Potentials of the Beef Production Industry in the South (contributing to Regional Proj. S-67).
Hatch 303	Regional Income and Employment Effects of Investments in Natural Resources (contributing to Regional Proj. S-71).
Hatch 304	Market Organization, Power and Policies and Programs in the Dairy Industry (contributing to Regional Proj. SM-40).

-
- | | |
|-----------|---|
| 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 368 | Effect of Alternative Resource Management Systems in the Obion-Forked Deer River Basin. |
| 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. |

Hatch 388	Social and Psychological Factors Related to Managerial Success.
Hatch 422	Present Impact and Development of the Craft Industry in Rural Tennessee.
Hatch 424C	Evaluation of Dairy Waste Management Systems.
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
An Economic Survey of the Obion-Forked Deer River Basin Area.
Tennessee Agricultural Experiment Station Bulletin 532, May 1974.
- Badenhop, M. B. and M. Dewayne Trail
Expenditure Patterns for Landscape Plants, Lawn Materials, and Related Supplies by Homeowners in Metropolitan Areas in Tennessee.
Tennessee Agricultural Experiment Station Bulletin 524, January 1974.
- 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
Expenditure Patterns by Southern Homeowners for Plantings, Lawn. Southern Florist and Nurserymen 87(4):10-13.
- Badenhop, M. B. and Cecil N. Smith
Expenditure Patterns for Landscape Plantings and Lawns by Homeowners in the South. Florida Agricultural Experiment Station Journal Series No. 5179, Proceedings: Florida State Horticultural Society 86:493-497, 1974.
- Badenhop, M. B. and T. Morris Jones
Fire Protection Services in Rural Areas and Fire Insurance Coverage of Rural Properties in Tennessee. Tennessee Farm and Home Science Progress Report No. 92, December 1974.

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.

Forward Contracting of Cotton in Tennessee: Attitudes of Growers, Ginners, and Buyers. Tennessee Farm and Home Science Progress Report 91, September 1974.

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.

Beef Brood Cow Herd Size in Tennessee. Tennessee Farm and Home Science Progress Report 89, March 1974.

Deaton, Brady J. and Dan Gunter

The Influence of Community Characteristics on Industrial Plant Location and Expansion: A Preliminary View. Tennessee Farm and Home Science Progress Report 91, September 1974.

Dubov, Irving

Marketing and Competition Research in the Southern Region: Problems and Priorities for Agriculture. Conference Proceedings: Joint Task Force on Marketing and Competition Research, p. 37, September 1974.

Dubov, Irving and E. L. Rawls

American Farm Price and Income Policies: Main Lines of Development, 1920-1973. Tennessee Agricultural Experiment Station Bulletin 539, December 1974.

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

Southern Homeowners' Expenditures and Use of Landscape Plants and Lawns. Proceedings: Southern Nurserymen's Research Conference, pp. 124-126, 1974.

Keller, Luther H. and Robert Ray

Farm Machinery Custom Rates by Crop Reporting Districts in Tennessee. Tennessee Agricultural Station Bulletin 525, January 1974.

Keller, Luther H.

Priorities for Farm Management Research and Use of Results in Extension. Proceedings of joint meeting of Southern Agricultural Management Research Work Group and Southern Extension Farm Management Committee, pp. 1-18, April 1974.

Martin, Joe A.

Agriculture Outlook, Tennessee Economic Outlook/1975—Part III. Tennessee Survey of Business, p. 21, November and December 1974.

McManus, B. R.

Leadership in Farm Credit. Tennessee Farm and Home Science Progress Report 92, December 1974.

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

Pricing Burley Tobacco Quota. Tennessee Farm and Home Science Progress Report 92, December 1974.

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

Culling Beef Cows. Tennessee Farm and Home Science Progress Report 92, December 1974.

Sappington, Charles

Estimated Returns From Feeding Out Purchased Feeder Pigs in Tennessee With and Without Using the Futures Market. Tennessee Agricultural Experiment Station Bulletin 526, January 1974.

Sappington, Charles

Long Run Prospects for Beef Prices. Tennessee Survey of Business, pp. 3, 4, and 16, June 1974.

Smith, Cecil N. and M. B. Badenhop

Expenditure Patterns for Landscape Plantings and Lawns by Homeowners in Florida. Florida Agricultural Experiment Station Journal Series No. 5182, Proceedings: Florida State Horticultural Society 86:466-470, 1974.

Trevena, Billy J. and Luther H. Keller

Estimating the Investment Behavior of Farm Firms Using the Concept of Rational Distributed Lag Functions. Southern Journal of Agricultural Economics, July 1974.

Trevena, Billy J.

Income and Investment: A Comparison by Farm Types. Farm and Home Science Progress Report 92, December 1974.

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 366	Measurement of Standard Cotton Fiber Properties.
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
Roof vs. No-Roof Silos: In Unloader Performance, Coating Durability, and Silage Consumption by Dairy Cows. Tennessee Farm and Home Science Progress Report 92, December 1974.
- Cheng, C. C. and K. E. Duckett
Azimuthal Intensity Profiles of Scattered Light from the Surface of Convuluted Cotton Fibers. Textile Research Journal 44:650-658, 1974.
- Cheng, C. C., J. L. White, and K. E. Duckett
A Continuum Mechanics Approach to Twisted Yarns. Textile Research Journal 44:798-803, 1974.
- Duckett, K. E. and C. C. Cheng
Humidity and Heat Effects on the Coefficient of Energy Dissipation. Textile Research Journal 44:365-370, 1974.
- Duckett, K. E.
Cotton Fiber Instrumentation Research in Tennessee. Tennessee Agricultural Experiment Station Bulletin 536, November 1974.
- Henry, Z. A. and W. H. Allen
Use of Hydrostatic Pressure in Development of Stress-Strain Information for Tomato Skins. Transactions of the American Society of Agricultural Engineers 17(4):787-789, 792, 1974.
- Lawson, Reba and K. L. Hertel
Effect of Sodium Hydroxide Concentrations on Selected Cotton Fiber Properties. Textile Research Journal 44:975-980, 1974.
- Mullins, James A., Joseph R. Overton, and Larry S. Jeffery
Response of Soybeans and Johnsongrass to Glyphosate Applications. Tennessee Farm and Home Science Progress Report 90, June 1974.
- Mullins, James A., Joseph R. Overton, and Larry S. Jeffery
Incorporation of Treflan for Controlling Johnsongrass in Soybeans. Tennessee Farm and Home Science Progress Report 90, June 1974.
- Mullins, J. A., Tom McCutchen, W. L. Parks, F. F. Bell, and Steve Parks
A 5-Year Comparison of Seedbed Preparation Systems for Cotton on Memphis and Collins Silt Loams. Tennessee Farm and Home Science Progress Report 92, December 1974.
- Ramey, H. H., Jr. and R. S. Krowicki
Data from Fiber and Spinning Tests. (Abstract). Proceedings: Cotton Production Research Conferences, p. 81, 1974.
- Ramey, H. H., Jr., J. H. Turner, Jr. and S. Worley, Jr.
1971 Regional Cotton Variety Tests. USDA ARS-S-33, 1974.

Ramey, H. H., Jr.

The Qualities of Cotton Produced in the U.S. Modern Textiles 55(10): 58, 60, 68, 1974.

Ramey, H. H., Jr.

A Systems Analysis Approach to Establishing Research Objectives for Control of Aflatoxin Production in Cotton Seed. Phytopathology 64:1451-1454, 1974.

Sewell, John I.

Surface and Subsurface Water Supplies and Groundwater Recharge. M. C. Blount (Ed.), Water Resources, Utilization and Conservation in the Environment, Taylor County Printing Company, Reynolds, Georgia, pp. 33-45, 1974.

Sewell, John I. and C. H. Shelton

Effects of Waste Management and Land Use Practices on Quality and Yield of Water from Agricultural Lands. Proceedings: Irrigation and Drainage Specialty Conference of American Society of Civil Engineers, Biloxi, Mississippi, August 14-16, 1974, pp. 44-56.

Sewell, John I. and William H. Allen

Visible and Infrared Remote Sensing in Soil Determination. F. Shahrokhi (Ed.). Remote Sensing of Earth Resources II:689-702, 1973. (Not previously listed.)

ANIMAL SCIENCE

Proj. No.

Research Project Titles

Hatch 52	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.
Hatch 61	The Improvement of the Producing Ability of Beef Cattle; cooperative with the Aluminum Company of America (contributing to Regional Proj. S-10).
Hatch 92	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).
Hatch 155	The Influence of Light Upon Performance of Domestic Chickens.
Hatch 161	Effect of Stage of Maturity of Corn Silage at Harvest or Yield Component and Its Relation to Resulting Milk Production.
Hatch 233	The Nutrition of Egg-Production-Type Chickens.

Hatch 268	The Identification and Control of Factors Affecting Reproductive Performance in the Bovine Female.
Hatch 284	Factors Affecting the Rate of Genetic Improvement of Dairy Cattle.
Hatch 297	Feed Requirements for Growth of Heifers.
Hatch 298	Bovine Mammary Gland Development During Gestation and Initial Stages of Lactation.
Hatch 300	Role of the Ultimobranchial Gland in Avian Osteoporosis.
Hatch 306	Breeding Methods for Beef Cattle in the Southern Region; cooperative with the U.S. Department of Agriculture (contributing to Regional Proj. S-10).
Hatch 307	Efficiency of Beef Production—Amount of Variation and Criteria for Improvement; cooperative with the U.S. Department of Agriculture.
Hatch 310	The Relationship of Body Length to Economically Important Traits in Meat-Type Swine.
Hatch 317	Feeding Programs for Maximum Efficiency and Optimum Body Composition.
Hatch 321	Hypomagnesia Relationship to Grass Tetany in Ruminant Animals.
Hatch 323	Relationship Between Properties of Southern Forages and Animal Response (contributing to Regional Proj. S-45).
Hatch 325	Endocrinology of Reproduction in Cattle.
Hatch 339	Mineral Studies in Large Animals Using Radiation and Radioisotope Tracers.
Hatch 342	The Mineral Nutrition of Egg-Production-Type Laying Hens.
Hatch 345	Evaluation of Beef Cow-Calf Management Systems as Measured by Production on Various Grazed and Harvested Forages.
Hatch 347	Evaluation of Pasture Mixtures and Pasture Management. Practices for Beef Production.
Hatch 351	Effect of Silage Quality on the Performance of Slaughter Animals.
Hatch 371	Stress and Laying Hen Performance.
Hatch 390	Micro and Macro Elements in Animals.

Hatch 424A	Dairy Waste Management Systems.
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

Hatch 309	Nutrition of the Gravid Gilt with Emphasis on Gestation Effects Upon Progeny Performance.
-----------	---

Bulletins, Articles, and Reports—1974

- Al-Khazraji, A. K., H. A. Al-Fayadh, and H. V. Shirley
Restrictions of Feed and Water to Layers. Tennessee Farm and Home Science Progress Report 91, September 1974.
- 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
Nutrient Digestibility and N Metabolism by Cattle Fed Rations Based on Urea and Corn Silage. Journal of Animal Science 39:408, 1974.
- Barth, Karl M., S. W. Coleman, J. A. Corrick, and P. E. Shumway
Effects of Level of Urea and Urea Plus Limestone on N Metabolism of Corn Silage-Based Rations by Cattle. Journal of Animal Science 38:687, 1974.
- Baxter, Harold D., J. C. Derbyshire, M. J. Montgomery, and J. R. Owen
Wheat and Corn Silages With and Without Formic Acid Treatment for Lactating Cows. Journal of Dairy Science 57:142, 1974.

- Bell, Marvin Carl and W. F. Byrne
Fallout Facts for Sheep Producers. USDA-ES, RCD-9, 1974.
- Bell, Marvin Carl and W. F. Byrne
Fallout Facts for Swine Producers. USDA-ES, RCD-8.
- Dowlen, Henry H., D. B. Batson, R. L. Murphree, and D. O. Richardson
Progesterone Levels in Cows Suspected of Embryonic Mortality.
Journal of Dairy Science 57:136, 1974.
- Jones, J. E., K. M. Barth, and S. W. Coleman
Effect of Pasture Type and Wintering Level on Gains of Slaughter
Heifers. Tennessee Farm and Home Science Progress Report 91, Sep-
tember 1974.
- Mascola, Joseph J., Karl M. Barth, and James B. McLaren
Fluoride Intake of Cattle Grazing Fluoride-Contaminated Forage, as
Determined by Esophageal-Fistulated Steers. Journal of Animal
Science 38:1298, 1974.
- Masincupp, Frank B.
The Effect of Zinc-Proteinate Added to Swine Finishing Rations.
Tennessee Farm and Home Science Progress Report 89, March 1974.
- Masincupp, Frank B. and Calvin F. Prince, Jr.
Effect of Various Levels of Bird-Resistant Grain Sorghum on the
Live Performance and Carcass Characteristics of Meat Type Swine.
Tennessee Farm and Home Science Progress Report 91, September
1974.
- Montgomery, Monty J., H. A. Fribourg, W. M. Hopper, and J. R. Overton
Effect of Maturity of Corn on Silage Quality and Milk Production.
Journal of Dairy Science 57:698-703, 1974.
- Moore, Ed D., H. H. Dowlen, J. R. Owen, and D. O. Richardson
Selection Among Jersey Artificial Insemination Bulls for Maximum
Milk Yield. Journal of Dairy Science 57:136, 1974.
- Moore, Ed D., H. H. Dowlen, S. L. Hansard, J. R. Owen, and D. O.
Richardson
Loss of Replacement Dairy Heifers Born 1958 through 1971 in a
Closed Herd. Journal of Dairy Science 57:140, 1974.
- Moore, Ed D., H. H. Dowlen, and J. R. Owen
Freeze Branding Methods for Permanent Identification of Dairy Ani-
mals. Journal of Dairy Science 57:140, 1974.
- Moore, Ed D., S. E. Bennett, H. H. Dowlen, L. D. Haws, J. R. Owen, and
D. O. Richardson
Comparison of Anthelmintic Treatments for Replacement Dairy
Heifers and Dairy Cows. Journal of Dairy Science 57:145, 1974.
- Neel, J. B., J. A. Corrick, Jr., and W. T. Butts, Jr.
The Influence of Initial Cow Weight on Calf Performance and TDN
Efficiency In Production of Slaughter Cattle. Tennessee Farm and
Home Science Progress Report 89, March 1974.

- Tebong, Emmanuel and H. V. Shirley
Growing Broilers in Cages in Darkness. Tennessee Farm and Home Science Progress Report 91, September 1974.
- Tracy, James, Jr., J. B. McLaren, and James O'Neal
Performance of Feeder Pigs of Various Grades. Tennessee Farm and Home Science Report 89, March 1974.
- Shirley, H. V.
Calcium and Phosphorus in Rations of Laying Stocks. Tennessee Farm and Home Science Progress Report 91, September 1974.
- Shirley, H. V.
The Seventeenth Tennessee Random Sample Laying Test, Final Report, 1974. Tennessee Random Sample Laying Test, University of Tennessee.
- Shrode, Robert R.
Heredity and How it Works. H. H. Cole and M. Ronning, eds. **Animal Agriculture**. San Francisco: W. H. Freeman and Co. pp. 239-57, 1974.
- Swanson, Eric W. and Eitard Imaizumi
How to Grow Heifers More Efficiently. Tennessee Farm and Home Science Progress Report 92, December 1974.

CHILD AND FAMILY STUDIES

Proj. No.	Research Project Titles
Hatch 265	Influences on Occupational Goals of Young People (contributing to Regional Proj. S-63).
Hatch 354	Assessment of Family Functioning in Rural Areas of Tennessee.
Hatch 405	Vocational and Educational Aspirations of Rural School Children and their Mothers.

Projects Concluded in 1974

Hatch 265	Influences on Occupational Goals of Young People.
-----------	---

Bulletins, Articles, and Reports—1974

Influences on Occupational Goals of Young People in Three Southern Subcultures. Research Report: Baseline and Experimental Phases. Information Series No. I. Southern Regional Research Project S-63.

**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.

Bulletins, Articles, and Reports—1974

- Carruth, K. B. and J. T. Smith
The Effect of Dietary Sulfate on Rat Tissue Glutathione Levels.
Federation Proceedings: 33:682, 1974.
- Smith, J. T. and R. S. Verma
Relative Conjugation of Glycine and Taurine with Cholic Acid in Rat Liver Microsome Preparations. Federation Proceedings: 33:689, 1974.
- Tucker, S. M., R. L. Mason and R. E. Beauchene
Effect of Feed Restriction on Kidney Function of Aging Male Rats.
The Gerontologist 14:40, 1974.
- Whittle, B. and J. T. Smith
Effect of Dietary Sulfur on Taurine Excretion by the Rat. Journal of Nutrition 104:666, 1974.

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.

Bulletins, Articles, and Reports—1974

- Baker, C. H., M. R. Johnston, and W. D. Barber
Cherry Plum Pigment as a Natural Red Food Colorant: Instrumental Evaluation. Food Product Development 8:3, April 1974.
- Baker, C. H., M. R. Johnston, and W. D. Barber
Cherry Plum Pigment as a Natural Red Food Colorant: Sensory Evaluation and Mutagenicity Testing. Food Product Development 8:4, May 1974.
- Demott, B. J. and J. R. Park
Effect of Processing Milk Upon Association of Added Iron with Different Protein Fractions. Journal of Dairy Science 57:121-123, January 1974.
- Eisele, G. R., F. R. Mraz, and M. R. Johnston
Effects of Whole-Body Gamma Irradiation on Various Chemical Properties of Muscle. Journal of Animal Science 38:1, 1974.

Jaynes, H. O. and C. T. Chiang

High Protein Snack Utilizes Whey Protein Concentrate. Food Product Development 8(9):32, 1974.

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

Yellow Squash Pickles. Tennessee Farm and Home Science Progress Report 91, September 1974.

Overcast, W. W. and Krishnaswamy Atmaram. The role of *Bacillus Cereus* in Sweet Curdling of Fluid Milk. Journal of Milk and Food Technology 37:5, May 1974.

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

Deoxyribonucleic Acid Hybridization Studies Among Some Strains of Group D and Group N Streptococci. International Journal of Systematic Bacteriology 24:3, July 1974.

FORESTRY

Proj. No.	Research Project Titles
Hatch 102	Forest Management.
Hatch 107	Relationship of Soil and Other Site Factors to Forest Composition and Productivity.
Hatch 185	Forest Tree Genetics (contributing to Regional Proj. S-23).
Hatch 207	Forest Tree Fertilization; cooperative with the Hiwassee Land Company.
Hatch 271	Forest Tree Breeding.
Hatch 280R	Atmospheric Influences on Ecosystems and Satellite Sensing; cooperative with the Agricultural Biology, Agricultural Engineering, and Plant and Soil Science Departments.
MS 2	Effects of Fertilization and Irrigation on Tree Growth.
MS 3	Quail Management on Forest and Associated Lands in West Tennessee.
MS 6	Wood Duck Ecology on Rivers and Impoundments.
MS 7	Blight Resistance in American Chestnut.
MS 8	Christmas Tree Breeding.
MS 9	Characteristics of Juvenile and Branch Wood in Hardwoods.
MS 10	Economics of Alternative Timber-Growing Practices in Tennessee Hardwood Stands.

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

Homing by Black Bears in the Great Smoky Mountains National Park. Proceedings: 3rd International Conference on Bear Research and Management. IUCN New Series Publication, Morges, Switzerland.

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

Use of Etorphine M99 for Immobilizing Black Bears. *Journal of Wildlife Management* 38(3):568-569, 1974.

Buckner, Edward R. and E. Thor

Fertilizer Favors Yellow-Poplar in a Mixed Plantation. Proceedings: 2nd Annual Hardwood Symposium of the Hardwood Research Council, Cashiers, North Carolina, 6 pp., 1974.

Dimmick, Ralph W.

Populations and Reproductive Effort Among Bobwhites in Western Tennessee. Proceedings: Southeastern Association of Game and Fish Commissioners Annual Conference 28:6, 1974.

- Eagar, Daniel C. and Steve Stafford
A Bibliography of the Black Bear (*Ursus americanus*) in North America: 1960-1973. Proceedings: 2nd Eastern Workshop on Black Bear Research and Management, Gatlinburg, Tennessee, 9 pp., 1974.
- Eubanks, Thomas R. and Ralph W. Dimmick
Dietary Patterns of Bobwhite Quail on Ames Plantation: Implications for Management. Tennessee Agricultural Experiment Station Bulletin 534, 1974.
- Hay, Ronald L. and Frank W. Woods
Root Deformation Correlated with Sampling Size for Loblolly Pine. Journal of Forestry 72(3):143-145, 1974.
- Hay, Ronald L. and Frank W. Woods
Shape of Root Systems Influences Survival and Growth of Loblolly Seedlings. Tree Planters' Notes 25(3): 1-2, 1974.
- Marcum, Larry C., Michael R. Pelton, and Larry E. Beeman
Prebaiting and the Use of Foot Snares for the Capture of Black Bears. Proceedings: 3rd International Conference on Bear Research and Management. IUCN New Series Publication, Morges, Switzerland, 1974.
- Minser, William G. III
Fee Dove Hunting. The Tennessee Conservationist 60(11):13, 1974.
- Minser, William G. III and J. M. Dabney
A Comparison of Day and Night Float Counts for Wood Duck Broods on the Holston River in East Tennessee. Proceedings: 27th Annual Conference of Game and Fish Commissioners. pp. 311-315, 1974.
- Minser, William G. III
Night vs. Day Float Counts for Wood Duck Broods. Minutes of the Mississippi River Flyaway Council. Technical Section, February 1974.
- Nichols, Robert G. and Michael R. Pelton
Fat in the Mandibular Cavity as an Indicator of Condition in Deer. Proceedings: Southeastern Game and Fish Commissioners Conference, White Sulphur Springs, West Virginia, 1974.
- Pelton, Michael R., Charles D. Scott, and Gordon M. Burghardt
Attitudes and Opinions of Persons Experiencing Property Damage and/or Personal Injury by Black Bears in the Great Smoky Mountains National Park. Proceedings: 3rd International Conference on Bear Research and Management. IUCN New Series Publication, Morges, Switzerland, 1974.
- Rennie, J. C. and E. E. Birth
Use of ERTS-1 Imagery in Forest Inventory. 3rd Annual Remote Sensing of Earth Resources Conference, The University of Tennessee Space Institute, Tullahoma 3:671-684, 1974.

Rennie, J. C.

Some Effects of Competition and Density on Dry Weight Produced. *Annals of Botany* 38:1003-1012, 1974.

Rink, George and E. Thor

Needle Retention and Customer Acceptance of Three Spruce Species. *American Christmas Tree Journal* 18(1): 3-5, 1974.

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

Breeding Virginia Pine for Better Growth on Acid Soil. *Proceedings: 2nd Research and Applied Technology Symposium on Mined-Land Reclamation*. pp. 168-174, 1974.

Thor, E. and P. E. Barnett

Taxonomy of *Abies* in the Southern Appalachians: Variation in Balsam Monoterpenes and Wood Properties. *Forest Science* 20(1): 32-40, 1974.

Thor, E.

White Pines from the Southern Appalachians. *Proceedings: 9th Central States Forest Tree Improvement Conference, Ames, Iowa*. pp. 145-152, 1974.

Thor, E. and G. M. Nichols

Some Effects of Fires on Litter, Soil, and Hardwood Regeneration. *Proceedings: Tall Timbers Fire Ecology Conference* 13:317-329, 1974.

Welborn, Thomas C.

A Checklist of Birds of the Tennessee Valley. Tennessee Valley Authority Publications, Division of Forestry, Fisheries and Wildlife Development, Norris, Tennessee, 1974.

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

An Approach to Allocating Forestry Incentive Program Funds. Tennessee Farm and Home Science Report 92. December 1974.

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

Assessment of Tennessee Timberland: A Guide to Implementing the Productivity Approach. Tennessee Agricultural Experiment Station Bulletin 527, 1974.

Woods, Frank W. and L. Barden

Characteristics of Lightning Fires in Southern Appalachian Forests. *Proceedings: 1973 Tall Timbers Fire Ecology Conference* 13:345-361, 1974.

Woods, Frank W. and W. T. Lawhon

Gamma Densitometry of Increment Cores. *Forest Science* 20:269-271, 1974.

ORNAMENTAL HORTICULTURE AND LANDSCAPE DESIGN

Proj. No.	Research Project Titles
Hatch 370	Shade Tree Cultivars.
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 Phytotoxicity 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.

Bentgrass Research in the South. Proceedings: 1974 Southern Turfgrass Conference, pp. 3-6.

Callahan, Lloyd M.

Plastic Mulches for Golf Greens. Proceedings: 1974 Annual Tennessee Turfgrass Conference, 8: 27-30.

PLANT AND SOIL SCIENCE

Proj. No.	Research Project Titles
Hatch 186	Forage Crops Management; Establishment, Persistence, and Productivity.
Hatch 211	Forage Crop Breeding.
Hatch 255	Fertilization, Soil and Crop Management Systems, Cultural Practices, and Plant Bed Management Systems for Burley Tobacco.

Hatch 256	Burley Tobacco Breeding.
Hatch 296	Environment-Management Interactions in Forage Crops Ecological Systems.
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.
Hatch 428	Soil Survey and Its Relation to Behavior of Different Soils Under Various Uses.

Proj. No.	Projects Concluded in 1974
------------------	-----------------------------------

Hatch 28	Moisture Sorption Characteristics of the Major Soils of Tennessee and the Relation of Moisture Tensions to Plant Growth and Fertilizer Utilization.
Hatch 33	Evaluation of the Performance of Varieties of Field Crops.
Hatch 34	Corn Improvement; cooperative with the Agricultural Biology Department.
Hatch 42	Potassium Fertilization of Farm Crops on Different Soil Series in Tennessee.
Hatch 48	Soil Survey of Tennessee to Help Determine Crop Adaptation and Management Requirements; cooperative with the U.S. Department of Agriculture.
Hatch 56	Trace Elements in Tennessee Agricultural Crops.
Hatch 79	Production and Improvement of Cotton Varieties Suitable to Tennessee Conditions; cooperative with the U.S. Department of Agriculture.
Hatch 123	Mineral Nutrition of Vegetable Crops.
Hatch 125	Mineral Nutrition of Fruit Crops.
Hatch 126	Vegetable Variety Investigations.
Hatch 127	Fruit Variety Investigations.
Hatch 163	Culture of Dark Tobacco.
Hatch 164	Nitrogen Fertilization of Farm Crops.
Hatch 183	Crop Response to Liming.
Hatch 208	Breeding for Improvement in Small Grain (Wheat, Oats, Barley and Rye); cooperative with the Agricultural Biology Department.
Hatch 224	Physiological Responses of Forage Crops to Management and Environment.

Hatch 237	The Disposition of Pesticides in the Soil (contributing to Regional Proj. S-62).
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.

Bulletins, Publications and Reports—1974

- Arnold, J. M., L. M. Josephson, W. L. Parks, and H. C. Kincer
Influence of Nitrogen, Phosphorus, and Potassium Applications on Stalk Quality Characteristics and Yield of Corn. *Agronomy Journal* 66:605-608, 1974.
- Brown, J. F. and H. D. Swingle
Controlling Virginia Copperleaf in Lima Beans. *Tennessee Farm and Home Science Progress Report* 89, March 1974.
- Buntley, G. J.
Top-level Management will be the Name of the Farming Game in 1975. *Tennessee Farmer*, December 1974.
- Buntley, G. J. and L. L. Bauer
Soybean Production on Some Major Tennessee Soils. *Tennessee Agricultural Experiment Station Bulletin No. 537*, November 1974.
- Carmona, B. Carlos, and L. S. Jeffery
Control Químico de Malezas en Papa en la Subestacion Agrope Cuaria Experimental "La Selva." (Chemical Weed Control in Potatoes at the Agricultural Experiment Substation of La Selva.) *Revista Facultad Nacional de Agronomia* 28:27-37, 1974.
- Coffey, D. L. and C. A. Mullins
Nitrogen Fertilization of Bush Blue Lake Snap Beans. *Tennessee Farm and Home Science Progress Report* 90, June 1974.

Coffey, D. L. and J. F. Brown

Enhancing Pepper Emergence by Seed Treatments. Tennessee Farm and Home Science Progress Report 89, March 1974.

Edwards, M. J., J. A. Elder, and M. E. Springer

The Soils of the Nashville Basin. Tennessee Agricultural Experiment Station Bulletin 499, August 1974.

Fribourg, H. A.

Fertilization of Summer Annual Grasses and Silage Crops. In Forage Fertilization, D. A. Mays (Ed.). American Society of Agronomy, Madison, Wisconsin, pp. 189-211, 1974.

Fribourg, H. A.

Quality Environment and Agriculture (Kaliteli Cevre ve Tarim). Proceedings: Ankara Symposium on Environmental Problems. (Cevre Sorunlari ve Cozum Yollari Sempozyumu) USIS, Ankara, Turkey, 1974.

Graves, C. R.

1974 Performance of Field Crop Varieties. Tennessee Agricultural Experiment Station Bulletin 538, December 1974.

Graves, Charles R., and J. A. Mullins, et al.

Production of Sunflowers in Tennessee. Tennessee Agricultural Experiment Station Bulletin 494, April 1972 (reprinted January 1974).

Graves, C. R., L. M. Safley, and B. N. Duck

Selected Corn Hybrids Evaluated in Tennessee. Tennessee Agricultural Experiment Station Bulletin 529, January 1974.

Graves, C. R. and W. L. Parks

Funk G-4808 and Pioneer Brand 3369A Evaluated at Four Nitrogen Placements and Two pH Levels in 1973 at Knoxville. Tennessee Farm and Home Science Progress Report 90, June 1974.

Graves, Charles R., Tom McCutchen, and Larry S. Jeffery

Lee 68 and Tracy Soybeans Evaluated for Yield Reduction When 2,4-DB was Applied Overtop. Tennessee Farm and Home Science Progress Report 91, September 1974.

Gupton, C. L., P. D. Legg, H. F. Ross, and L. A. Link

Genotype x Environment Interactions in Burley Tobacco Variety Tests. Crop Science 14:811-814, 1974.

Gupton, C. L. and M. O. Neas

Burley 64 Tobacco Variety. Tennessee Agricultural Experiment Station Bulletin 530, February 1974.

Gupton, C. L. and M. O. Neas

Registration of Burley 64 Tobacco. Crop Science 14:607, 1974.

Gupton, C. L. and L. G. Burk

Location of the Factor for Resistance to Potato Virus Y in Tobacco. Journal of Heredity 64:289-290, 1974.

- Hickey, J. S. and W. A. Krueger
Alachlor and 1,8-naphthalic Anhydride Effects on Corn Coleoptiles.
Weed Science 22:250-252, 1974.
- Hickey, J. S. and W. A. Krueger
Alachlor and 1,8-naphthalic Anhydride Effects on Sorghum Seedling Development. Weed Science 22:86-90, 1974.
- Hoskinson, P. E., J. A. Mullins, and Tom McCutchen
Narrow Row Cotton in Tennessee. Tennessee Agricultural Experiment Station Bulletin 535, November 1974.
- Hoskinson, P. E.
1973 Performance of Cotton Varieties. Tennessee Agricultural Experiment Station Bulletin 528, February 1974.
- Hoskinson, P. E. and Smith Worley, Jr.
Cultivar x Environment Interaction for Some Fiber Traits. Proceedings: Beltwide Cotton Production Research Conference, pages 70-71, 1974.
- Hoskinson, P. E., C. R. Graves, and Tom McCutchen
Effects of Four Harvest Dates on Agronomic and Fiber Properties of Cotton. Tennessee Farm and Home Science Progress Report 89, March 1974.
- Josephson, L. M. and J. W. Hilty
Sorghum Downy Mildew—A New and Potentially Serious Disease of Corn in Tennessee. Tennessee Farm and Home Science Progress Report 89, March 1974.
- Josephson, L. M. and H. C. Kincer
Tcms Restoring Genes in Open-pollinated Varieties. Maize Genetics Cooperative News Letter 48:146, 1974.
- Josephson, L. M. and H. C. Kincer
Conversion of Inbreds T¹¹⁵ and T²⁰² to Non-restoration of Tcms. Maize Genetics Cooperative News Letter 48:147, 1974.
- Josephson, L. M. and H. C. Kincer
Conversion of Virus-resistant Inbreds to Various Male-sterile Cytoplasms. Maize Genetics Cooperative News Letter 48:147, 1974.
- Josephson, L. M. and M. J. Constantin
Attempts to Modify Cell Organelles of Tcms by Irradiation. Maize Genetics Cooperative News Letter 48:148, 1974.
- Krueger, W. A., L. M. Josephson, and J. W. Hilty
Response of Mitochondria from Corn Cytoplasms to the Pathotoxin of *Helminthosporium maydis* Race T. Phytopathology 64:735-737, 1974.
- Lessman, G. M.
Differential Response of Plant Genotypes to Magnesium Fertilization. In Magnesium in the Environment, J. B. Jones, Jr. (Ed.). Taylor County Printing Co., Reynolds, Georgia, p. 177-190, 1974.

Morgan, T. H., Jr. and C. R. Graves

Silage Yields of Sweet Sorghum x Grain Sorghum Varieties. Tennessee Farm and Home Science Progress Report 91, September 1974.

Mullins, C. A.

Apple Variety Performance on the Cumberland Plateau of Tennessee. Tennessee Agricultural Experiment Station Bulletin 531, March 1974.

Mullins, C. A.

Performance of an 8-Year-Old Hedgerow Orchard on the Tennessee Cumberland Plateau. Tennessee Farm and Home Science Progress Report 91, September 1974.

Overton, J. R., J. A. Mullins, and L. S. Jeffery

Combination of Practices to Control Johnsongrass in Soybeans. Tennessee Farm and Home Science Progress Report 90, June 1974.

Overton, J. R., J. A. Mullins, and L. S. Jeffery

Control of Johnsongrass in Soybeans with Preplant Incorporated Herbicides. Tennessee Farm and Home Science 90, June 1974.

Overton, J. R., J. A. Mullins, L. S. Jeffery, and John Measells

Date of Planting Soybeans as Affected by Time of Applying Treflan for Johnsongrass Control. Tennessee Farm and Home Science Progress Report 90, June 1974.

Overton, J. R. and Frank F. Bell

Productivity of Soils on the West Tennessee Experiment Station for Corn. Tennessee Farm and Home Science Progress Report 90, June 1974.

Parameswarappa, R., L. M. Josephson, and E. E. Hartwig

Inheritance of Spider Mite Damage in Soybeans. Journal of Heredity 65:379-380, 1974.

Parks, W. L., S. D. Livingston, and J. R. Overton

Effects of Water and Light on Soybean Yield. Soybean Production, Marketing, and Use, TVA Bulletin Y-69:33-38, 1974.

Parks, W. L., J. I. Sewell, J. W. Hilty, and J. C. Rennie

Utilizing ERTS Imagery to Detect Plant Diseases and Nutrient Deficiencies, Soil Types, and Soil Moisture Levels. Final Report, NASA Contract No. NAS5-21873, 1974.

Reynolds, J. H. and C. R. Graves

Kenstar, A New Red Clover Variety Added to Recommended List. Tennessee Farm and Home Science Progress Report 89, March 1974.

Reynolds, J. H., C. R. Graves, C. R. Leslie, and S. E. Bennett

Alfalfa Weevil Resistance in Four Alfalfa Varieties When Sprayed and Unsprayed. Tennessee Farm and Home Science Progress Report 90, June 1974.

- Safley, J. M., Jr., H. A. Fribourg, J. V. Vaiksnoras, and R. H. Strand
Probability of Sequences of Wet and Dry Days for Tennessee. NOAA
Technical Memo. EDS 22, 1974.
- Safley, J. M., Jr. and W. L. Parks
Agricultural Drouth Probabilities in Tennessee. Tennessee Agricultural
Experiment Station Bulletin 533, August 1974.
- Sparks, Darrell, J. W. Chapman, and D. W. Lockwood
Stratification Promotes Germination. The Pecan Quarterly 8(1):13,
1974.
- Steffans, G. L., B. C. Nichols, and Heinz Seltmann
1973 Advanced Regional Tobacco Growth Regulator Field Tests—
Effects of Chemical Agents on Plant Development, Sucker Growth,
and Cured Leaf Yield and Value. Progress Report, USDA, ARS,
Plant Physiology Institute Report No. 5, 1974.
- Steffans, G. L., Heinz Seltmann, and B. C. Nichols
Evaluations of 1973 Regional Tobacco Growth Regulator Tests—
Chemical and Physical Properties, Cured Leaf Appraisals and Smoke
Taste Evaluations of Flue-cured and Burley Tobacco. USDA, ARS,
Plant Physiology Institute Research Report, 1974.
- Springer, M. E.
Soil Survey of Meigs County, Tennessee. Soil Conservation Service,
USDA, and Tennessee Agricultural Experiment Station, 71 pages,
1974.
- Stewart, James McD. and Thomas Kerr
Relationship Between Fiber-length Increase and Seed-Volume In-
crease in Cotton (*Gossypium hirsutum* L.). Crop Science 14:118-120,
1974.
- Tabor, R. L., F. F. Bell, G. J. Buntley, H. A. Fribourg, and M. E. Springer
Agronomic Productivity of the Landscapes of Three Soil Associa-
tions in Maury County, Tennessee: An Analysis. Journal of Soil
and Water Conservation, Volume 29, 1974.
- Turner, J. H., E. G. Smith, and David Ferguson
Selecting for Productivity Within a Strain of Cotton in Three En-
vironments. Theoretical and Applied Genetics 45:86-89, 1974.
- Worley, Smith, Jr., T. W. Culp, and D. C. Harrell
The Relative Contributions of Yield Components to Lint Yield of
Upland Cotton *Gossypium hirsutum* L. Euphytica 23(2):399-403,
1974.
- El-Sourady, Abdel S., Smith Worley, Jr., and Lee S. Stith
The Relative Contributions of Fiber Properties to Variations in Yarn
Strength in Upland Cotton. Textile Research Journal 44:(4):301-
306, 1974.

TEXTILES AND CLOTHING

Proj. No.	Research Project Titles
State 65	The Effects of Mold Fungus and Bleach on Two Flame Retardant Fabrics.
Hatch 358	Performances of Selected Fabrics Treated with Flame Retardant Finishes.
Hatch 434	An Evaluation of Selected Laundry Variables on Commercially Available Flame Retardant Children's Sleepwear Garments.

UT—COMPARATIVE ANIMAL RESEARCH LABORATORY

Proj. No.	Research Project Titles
1	Effects of Radiation on Development and Reproduction.
2	Somatic Cell Genetics, Mutagenesis, and Morphogenesis in Angiospermae.
3	Metabolism of Internally-Deposited Radionuclides.
4	Biodeling.
5	Cytological Studies in Irradiated Mammals.
6	Late Somatic Effects of Radiation.
Hatch 369	New Plants: Their Introduction, Multiplication, Evaluation, and Preservation (contributing to Regional Proj. S-9).
Hatch 390	Comparative Metabolism of Micro- and Macro-Elements in Animals.
Hatch 401	Mutagenesis and the Development of Mutant Germ Plasm in Economic Plants.
Hatch 410	Species Comparisons of Pre- and Post-Natal Utilization of Mineral Elements.

Bulletins, Articles, and Reports—1974

Bell, M. C. and W. F. Byrne

Fallout Facts for Swine Producers. Pamphlet prepared by the Comparative Animal Research Laboratory in cooperation with the University of Tennessee, the USDA, and the DCPA, 1974.

Byrne, W. F. and M. C. Bell

Fallout Facts for Sheep Producers. Pamphlet prepared by the Comparative Animal Research Laboratory in cooperation with the University of Tennessee, the USDA, and DCPA, 1974.

Conger, B. V. and M. J. Constantin

The Effectiveness of Fission Neutrons, 14.7 MeV Monoenergetic Neutrons and ^{60}Co Gamma Radiation on Seedling Growth Reduction and Induction of Chlorophyll-Deficient Mutations in Barley. In *Biological Effects of Neutron Irradiation*. International Atomic Energy Agency, 1974.

Conger, B. V., M. J. Constantin, and P. J. Bottino

Chlorophyll-Deficient Mutation Frequency in Barley Following Continuous Gamma Irradiation Over a Wide Range of Exposures Throughout the Life Cycle. *Mutation Research* 23:372-335, 1974.

Constantin, M. J., D. D. Killion, and A. C. Blake

Fallout Facts for Corn Products Producers. Pamphlet prepared by the Agricultural Extension Service and Comparative Animal Research Laboratory in cooperation with DBER, USDA, and DCPA, 1974.

Constantin, M. J., B. V. Conger, J. B. Chowdhury, and R. T. Ramage

Chlorophyll-Deficient Mutants in Barley: Effects of Chemical Mutagens on Irradiated and Non-Irradiated Seeds After Various Periods of Presoaking. In *Polyploidy and Induced Mutations in Plant Breeding*. International Atomic Energy Agency, 1974.

Eisele, G. R.

Bacterial and Biochemical Studies on Gamma-Irradiated Swine. *American Journal of Veterinary Research* 35:1305-1308, 1974.

Eisele, G. R., F. R. Mraz, and M. R. Johnston

The Effects of Whole-Body Gamma Irradiation on Various Chemical Properties of Muscle. *Journal of Animal Science* 38:20-23, 1974.

Eisele, G. R. and H. E. Walburg

International Emitter Data Retrieval System—A New Approach. *Proceedings: Fifth International Congress of Radiation Research*, 1974.

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

Effects of Separate and Combined Beta and Gamma Irradiation on the Soybean Plant. *Radiation Botany* 14:91-99, 1974.

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

Chromosome Aberration Persistence in Swine Leukocytes Following Exposure to Fission Neutrons. *Mutation Research* 23:79-86, 1974.

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

Chromosome Aberrations in the Leukocytes of Partial-Body and Whole-Body-Irradiated Swine. *Radiation Research* 60:165-172, 1974.

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

Effect of Thyroid Status on Digestive Tract Fill and Flow Rate of Undigested Residue in Cattle. *Journal of Dairy Science* 57:193-197, 1974.

- Miller, J. K., E. W. Swanson, G. E. Spalding, W. A. Lyke, and R. F. Hall
The Role of the Abomasum in Recycling of Iodine in the Bovine.
Proceedings: Second International Symposium Trace Element Metabolism in Animals, 1974.
- Moss, B. R., F. C. Madsen, S. L. Hansard, and G. T. Gamble
Maternal-Fetal Utilization of Copper by Sheep. Journal of Animal Science 38:475-479. 1974.
- Sasser, L. B., L. Wade, Jr., and M. C. Bell
Effect of Radiation on Metabolism of Selected Minerals in Cattle.
Journal of Animal Science 38:178-185, 1974.

THE UNIVERSITY OF TENNESSEE AT MARTIN

AGRICULTURE DEPARTMENT

Proj. No.	Research Project Titles
Hatch 33	Evaluation of the Performance of Varieties of Field Crops; cooperative with the Plant and Soil Science Department.
Hatch 161	Evaluation of Forages for Dairy Cattle; cooperative with the Animal Science Department.
Hatch 211	Breeding and Genetics of Forage Crops; cooperative with the Plant and Soil Science Department.
Hatch 302	Corn Disease Monitoring Program; cooperative with the Agricultural Biology Department.
Hatch 296	Phenology of Selected Indicator Plants; cooperative with the Plant and Soil Science Department.
Hatch 323	Relationship Between Properties of Southern Forages and Animal Response; cooperative with the Animal Science Department.

STATION PERSONNEL—1974

**The University of Tennessee
Agricultural Experiment Station
Knoxville, Tennessee 37901**

AGRICULTURAL COMMITTEE**Board of Trustees**

Edward J. Boling, President of the University
Clyde M. York, Chairman Ben Douglass, Vice Chairman
Wayne Fisher, Harry W. Laughlin, Don O. Shadow
Guilford Thornton, Commissioner of Agriculture

STATION OFFICERS**Administration**

Edward J. Boling, President
Webster Pendergrass, Vice President for Agriculture
E. J. Chapman, Assistant Vice President
J. A. Ewing, Dean
D. M. Gossett, Assistant Dean
T. J. Whatley, Assistant Dean
O. Clinton Shelby, Director of Business Affairs
W. H. Jones, Accountant
William L. Sanders, Statistician

AGRICULTURAL BIOLOGY

Carroll J. Southards, Head of Department	John R. Evans, Graduate Research, Assistant
Gayle F. Bailey, Graduate Research Assistant	Margaret L. Hedrick, Graduate Research Assistant
Albert Y. Chambers, Associate Professor, Jackson	James W. Hilty, Associate Professor
Robert J. Cox, Graduate Research Assistant	Leander F. Johnson, Professor
Marion D. Ellis, Graduate Research Assistant	Lavone Lambert, Graduate Re- search Assistant
James M. Epps, Associate Professor, Jackson ¹	Dennis H. Latham, Associate Professor, Springfield
	Gary L. Lentz, Assistant Professor, Jackson

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

Donny McFall, Graduate Research Assistant	N. B. Shamiyeh, Research Assistant
Eugene H. Moody, Assistant Professor	Joe D. Simpson, Graduate Research Assistant
James W. Mullins, Graduate Research Assistant	Robert P. Smith, Graduate Research Assistant
Gayle V. Parrish, Graduate Research Assistant	Melvin Warren, Graduate Research Assistant
Charles D. Pless, Associate Professor	James L. Wilson, Associate Professor
Howard E. Reed, Associate Professor	William B. Wyatt, Graduate Research Assistant

AGRICULTURAL COMMUNICATIONS

Fletcher Sweet, Head of Department	C. A. Reinhardt, Associate Professor
F. E. Berggren, Assistant Professor	
A. H. Mitchell, Agricultural Librarian	

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

J. A. Martin, Head of Department	J. L. Garrett, Graduate Research Assistant
D. D. Asbridge, Graduate Research Assistant	M. D. Gray, Graduate Research Assistant
M. B. Badenhop, Professor	T. D. Hewitt, Graduate Research Assistant
L. L. Bauer, Associate Professor	H. A. Hutsell, Graduate Research Assistant
J. R. Brooker, Assistant Professor	L. H. Keller, Professor
D. W. Brown, International Professor	T. H. Klindt, Assistant Professor
C. L. Cleland, Professor and Ombudsman	T. H. Lederer, Graduate Research Assistant
W. T. Coyle, Graduate Research Assistant	F. O. Leuthold, Associate Professor
J. A. Culver, Graduate Research Assistant	Gonzalee Martin, Graduate Research Assistant
C. M. Cuskaden, Assistant Professor	B. R. McManus, Associate Professor
Raymond Daniel, Associate Professor	L. C. Morgan, Assistant Professor
B. J. Deaton, Assistant Professor	S. D. Mundy, Assistant Professor
J. M. Devine, Graduate Research Assistant	W. D. Pitt, Jr., Graduate Research Assistant
Irving Dubov, Professor	R. M. Ray, Assistant Professor
F. H. Fox, Jr., Graduate Research Assistant	Jerome Reece, Graduate Research Assistant

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

C. D. Safley, Graduate Research Assistant
C. B. Sappington, Associate Professor
J. G. Snell, Associate Professor

B. J. Trevena, Assistant Professor
E. M. Wimbish, Graduate Research Assistant
M. J. Yetley, Assistant Professor

AGRICULTURAL ENGINEERING

D. H. Luttrell, Head of Department
D. O. Baxter, Assistant Professor
B. L. Bledsoe, Associate Professor
R. G. Carpenter, Graduate Research Assistant
K. E. Duckett, Associate Professor
P. R. Ewald, Associate Professor¹
J. L. Goodenough, Assistant Professor¹
Z. A. Henry, Associate Professor
J. S. Jablonski, Graduate Research Assistant
R. S. Krowicki, Assistant Professor¹
Reba Lawson, Assistant Professor¹
J. R. Lehman, Graduate Research Assistant
J. K. McDonald, Graduate Research Assistant

A. H. Morgan, Associate Professor
J. A. Mullins, Professor, Jackson
H. H. Ramey, Professor¹
D. R. Robertson, Graduate Research Assistant
J. I. Sewell, Professor and Associate Head
C. H. Shelton, Associate Professor
J. D. Simmons, Graduate Research Assistant
R. B. Stone, Associate Professor¹
J. E. Temple, Graduate Research Assistant
F. D. Tompkins, Assistant Professor
L. R. Wilhelm, Assistant Professor

ANIMAL SCIENCE

R. R. Johnson, Head of Department
W. R. Backus, Associate Professor
J. A. Bacon, Instructor
K. M. Barth, Associate Professor
B. J. Bearden, Assistant Professor
M. C. Bell, Professor
J. K. Bletner, Professor
G. D. Boyd, Instructor
W. T. Butts, Jr., Associate Professor¹
L. A. Carver, Graduate Research Assistant
C. C. Chamberlain, Professor
H. M. Crowder, Instructor
H. H. Dowlen, Assistant Professor
T. M. Estes, Graduate Research Assistant

M. E. Fryer, Instructor
H. C. Goan, Assistant Professor
J. Herr, Graduate Research Assistant
J. F. Holbert, Graduate Research Assistant
J. C. Hodges, III, Graduate Research Assistant
R. Ingram, Graduate Research Assistant
H. M. Jamison, Professor
E. R. Lidvall, Associate Professor
W. D. Ligon, Graduate Research Assistant
W. A. Lyke, Instructor
G. C. McGhee, Laboratory Assistant

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

J. R. McCurley, Graduate Research Assistant	D. O. Richardson, Associate Professor
J. B. McLaren, Associate Professor	H. V. Shirley, Associate Professor
F. B. Masincupp, Assistant Professor	R. R. Shrode, Professor
M. J. Montgomery, Associate Professor	J. D. Smalling, Assistant Professor
R. L. Murphree, Professor	E. W. Swanson, Professor
D. O. Onks, Graduate Research Assistant	R. L. Tugwell, Professor
Jeanette I. Poffenbarger, Graduate Research Assistant	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	Marjorie P. Penfield, Assistant Professor
Mia M. Armitage, Graduate Research Assistant	Doris E. Phillips, Graduate Research Assistant
Roy E. Beauchene, Professor	John T. Smith, Professor
Ada M. Campbell, Professor	Martha B. Stone, Graduate Research Assistant
Gail W. Disney, Assistant Professor	Verdis L. Taylor, Graduate Research Assistant
Janet S. Kurzynske, Graduate Research Assistant	Elizabeth A. Yetley, Assistant Professor
Rossie L. Mason, Assistant Professor	

FOOD TECHNOLOGY AND SCIENCE

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

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 | T. E. Morgan, Graduate Research Assistant |
| B. V. Conger ² , Associate Professor, Oak Ridge | S. L. Morris, Graduate Research Assistant |
| J. T. Connell, Assistant Professor, Grand Junction | C. A. Mullins, Assistant Professor, Crossville |
| M. B. Donoho, Graduate Research Assistant | B. C. Nichols ¹ , Associate Professor, Greeneville |
| H. A. Fribourg, Professor | J. R. Overton, Associate Professor, Jackson |
| C. R. Graves, Associate Professor | W. L. Parks, Professor |
| C. L. Gupton ¹ , Associate Professor, Greeneville | D. L. Reasons, Graduate Research Assistant |
| D. B. Hannaway, Graduate Research Assistant | V. H. Reich, Assistant Professor |
| B. G. Harville, Graduate Research Assistant | J. H. Reynolds, Associate Professor |
| P. E. Hoskinson, Associate Professor, Jackson | L. D. Robertson, Graduate Research Assistant |
| L. S. Jeffery, Assistant Professor | R. H. Rogers, Graduate Research Assistant |
| L. M. Josephson, Professor | C. E. Sams, Graduate Research Assistant |
| H. C. Kincer, Assistant Professor | J. B. Sikes, Jr., Graduate Research Assistant |
| W. A. Krueger, Assistant Professor | L. W. Skinner, Graduate Research Assistant |
| G. M. Lessman, Assistant Professor | L. N. Skold, Professor |
| R. J. Lewis, Associate Professor | H. C. Smith, Associate Professor |
| D. W. Lockwood, Assistant Professor | M. E. Springer, Professor |
| R. W. Loveland, Graduate Research Assistant | J. M. Stewart ¹ , Assistant Professor |
| A. R. McDaniel, Graduate Research Assistant | H. D. Swingle, Professor |
| W. Miller, Graduate Research Assistant | J. Turner ¹ , Associate Professor |
| T. H. Morgan, Jr., Assistant Professor, Spring Hill | S. Worley ¹ , Associate Professor |

TEXTILES AND CLOTHING

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

UT—COMPARATIVE ANIMAL RESEARCH LABORATORY

- | | |
|---------------------------------------|---|
| H. E. Walburg, Laboratory Director | J. M. Bird, Superintendent |
| D. M. Robie, Administrative Assistant | B. V. Conger ² , Associate Professor |
| | M. J. Constantin, Professor |

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

²In cooperation with the UT-Comparative Animal Research Laboratory.

E. B. Darden, Professor
 G. R. Eisele, Assistant Professor
 C. Joan Ellis, Editor
 B. H. Erickson, Professor
 E. T. Graham, Associate Professor
 S. L. Hansard, Professor
 D. F. Johnson, Jr., Professor
 B. J. Kelman, Postdoctoral
 Research Associate
 D. D. Killion, Assistant Professor
 W. D. Klobe, Assistant Professor
 W. J. Kopp, Professor
 A. F. McFee, Associate Professor
 F. C. Madsen, Postdoctoral
 Research Associate

Polly G. Martin, Associate
 Professor
 J. K. Miller, Associate Professor
 F. R. Mraz, Professor
 R. L. Murphree, Professor
 T. R. Noonan, Professor
 R. A. Reynolds, Assistant Professor
 L. B. Sasser, Assistant Professor
 G. E. Spalding, Associate Professor
 D. L. Stoddard, Assistant Professor
 K. M. Wallace, Applied Health
 Physicist
 J. F. Weiss, Assistant Professor
 J. L. West, Professor
 Wei-O Wong, Biostatistician

THE UNIVERSITY OF TENNESSEE AT MARTIN

AGRICULTURE DEPARTMENT

H. J. Smith, Dean, School of
 Agriculture
 E. W. Culvahouse, Associate
 Professor of Dairying
 B. N. Duck, Assistant Dean and
 Professor of Agronomy

B. R. Hathcock, Associate Professor
 of Agronomy
 H. A. Henderson, Farm Manager
 N. W. Robinson, Professor of
 Animal Science

MAIN STATION, KNOXVILLE

J. N. Odom, Superintendent of Farms

BRANCH STATIONS

Dairy Experiment Station¹, Lewis-
 burg, J. R. Owen¹, Superinten-
 dent
 Highland Rim Experiment Station,
 Springfield, L. M. Safley, Super-
 intendent
 Middle Tennessee Experiment Sta-
 tion, Spring Hill, J. W. High, Jr.,
 Superintendent

Plateau Experiment Station, Cross-
 ville, R. D. Freeland, Superinten-
 dent; R. Q. Snider, Manager
 Tobacco Experiment Station¹,
 Greeneville, Donald D. Howard,
 Superintendent
 West Tennessee Experiment Sta-
 tion, Jackson, H. W. Luck,
 Superintendent

FIELD STATIONS

Ames Plantation, Grand Junction,
 James M. Bryan, Superintendent
 Forestry Field Stations at Tulla-
 homa, Wartburg, and Oak Ridge,
 Richard M. Evans, Superinten-
 dent

Milan Field Station, Milan, T. C.
 McCutchen, 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. Robinson, 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

- 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. Constantin, Professor, UT-Comparative Animal Research Laboratory, August 29, 1974

RETIREMENTS

- J. Hugh Felts, Superintendent¹, Tobacco Experiment Station¹, 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
- Leo J. Hardin, Retired Associate Professor, Plant and Soil Science Department, January 10, 1974
- Bernadine Helen Meyer, Professor, Food Science and Food Systems Administration Department, June 5, 1974

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