



1983

Annual Report of the Tennessee Agricultural Experiment Station, 1983

University of Tennessee Agricultural Experiment Station

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Annual Report of the

*Tennessee
Agricultural
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1983*

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The University of Tennessee
Knoxville

**Ninety-Sixth
Annual Report
1983**

**Tennessee
Agricultural Experiment Station**

Edward J. Boling President of the University
W. W. Armistead Vice President for Agriculture
B. H. Pentecost Assistant Vice President for Agriculture
D. M. Gossett Dean
T. J. Whatley Associate Dean
John I. Sewell Assistant Dean

**The University of Tennessee
Knoxville**

LETTER OF TRANSMITTAL

Knoxville, Tennessee
January 2, 1984

To His Excellency, Lamar Alexander
Governor of Tennessee:

SIR: I have the honor transmitting herewith, on behalf of the Board of Trustees of the University of Tennessee, a report of the work and expenditures of the Agricultural Experiment Station for the year 1983.

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

Respectfully submitted,
Edward J. Boling, President

CONTENTS

Foreword	3
Active Projects	3
Projects Terminated	3
Publications	3
Financial Statement	4
Map	5
Agricultural Economics and Rural Sociology	6
Agricultural Engineering	10
Animal Science	12
Child and Family Studies	16
Communications	17
Entomology and Plant Pathology	17
Food Technology and Science	20
Forestry, Wildlife, and Fisheries	22
Nutrition and Food Science	26
Ornamental Horticulture and Landscape Design	28
Plant and Soil Science	30
Rural Practice	35
Textiles, Merchandising, and Design	35
Station Personnel	36
Personnel Changes	43

Ninety-Sixth Annual Report of the Tennessee Agricultural Experiment Station 1983

FOREWORD

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

- 1) Research projects active as of December 31, 1983;
- 2) Research projects terminated during the calendar year, 1983;
- 3) Bulletins, articles, and reports prepared by Experiment Station staff members and published during the calendar year 1983.

In addition, this report contains the financial statement for the Agricultural Experiment Station covering the period July 1, 1982 to June 30, 1983. Also included is a list of the Experiment Station personnel for the calendar year 1983.

Active Projects

As of December 31, 1983, there were 167 Hatch (TN) projects and five State (S) projects. Hatch projects are supported in part with Federal-Grant funds made available by Congress to the Agricultural Experiment Stations of the country under the Hatch Act Amended. State projects are supported entirely by University funds. There were 12 McIntire-Stennis (forestry) projects.

The headquarters of the Tennessee Agricultural Experiment Station is located on the agricultural campus of the University of Tennessee at Knoxville. In addition, there are other research centers which represent soil and climate conditions in the major regions of Tennessee. These other research centers are listed at the end of this report, and their locations are shown on the inside front cover.

Projects Terminated

During 1983, 21 projects were terminated. Reports on these projects have either been published or are being prepared for publication.

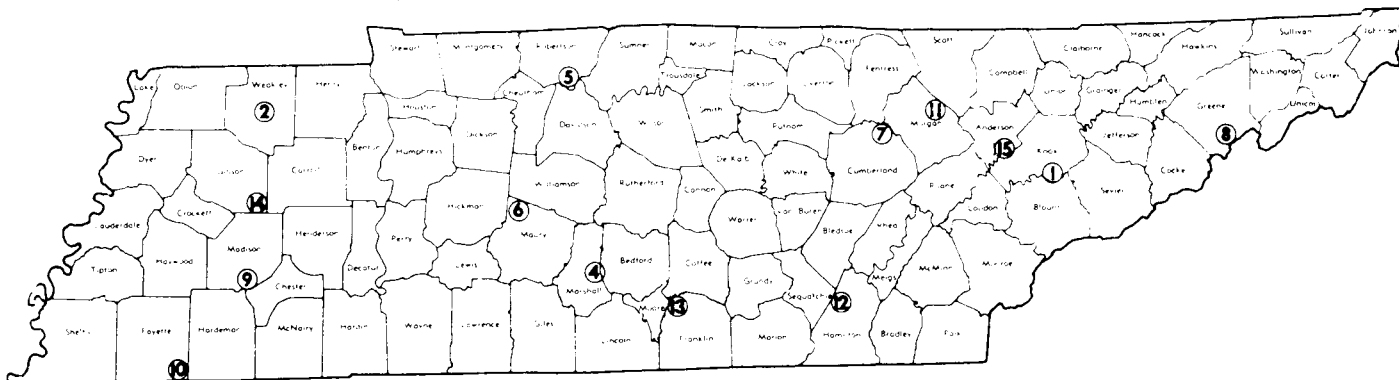
Publications

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 16 Station Bulletins, 15 Research Reports, two International Reports, and four regional bulletins published during the year. These publications and other technical, semi-technical, and special reports prepared and published during 1983 are listed in this annual report.

FINANCIAL STATEMENT
July 1, 1982 — June 30, 1983
The University of Tennessee Agricultural Experiment Station

Balance June 30, 1982			\$ 566,684.81
	Restricted	Unrestricted	
Revenues:			
Federal Appropriation		\$ 4,146,956.73	4,146,956.73
State Appropriation	\$1,571,602.16	5,478,000.00	7,049,602.16
Federal Grants & Contracts	387,695.46	21,186.79	408,882.25
State Grants & Contracts	83,281.93	1,248.58	84,530.51
Private Gifts, Grants & Contracts	374,298.33	7,408.84	381,707.17
Endowment Income	9,259.07		9,259.07
Sales & Services		3,423,933.23	3,423,933.23
Other Sources		<u>26,872.74</u>	<u>26,872.74</u>
Total Revenues	\$2,426,136.95	\$13,105,606.91	\$15,531,743.86
Total Funds Available			\$16,098,428.67
Expenditures & Transfers:			
Research	\$2,221,119.47	\$11,998,094.48	\$14,219,213.95
Institutional Support	<u>205,017.48</u>	<u>896,213.53</u>	<u>1,101,231.01</u>
Total Expenditures & Transfers	\$2,426,136.95	\$12,894,308.01	\$15,320,444.96
Balance June 30, 1983			\$ 777,983.71

The University of Tennessee Agricultural Experiment Station



- 1 Knoxville Experiment Station
- 2 Martin Experiment Station

Branch Stations

- | | |
|---------------------------------------|---|
| 4 Dairy Experiment Station | 10 Ames Plantation |
| 5 Highland Rim Experiment Station | 11 Cumberland Forestry Field Station* |
| 6 Middle Tennessee Experiment Station | 12 Friendship Forestry Field Station* |
| 7 Plateau Experiment Station | 13 Highland Rim Forestry Field Station* |
| 8 Tobacco Experiment Station | 14 Milan Experiment Station |
| 9 West Tennessee Experiment Station | 15 Oak Ridge Forest and Arboretum* |

*Forestry Experiment Station

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 553(S-141)	Housing for Low and Moderate Income Families
TN 554	Rural Economics and the Structure of the Agricultural Production Sector in Tennessee
TN 603(S-148)	Changing Structure of Agriculture: Causes, Consequences and Policy Implications
TN 609	Migration and Other Demographic Changes of the Tennessee Rural Population
TN 619	Economics of Tobacco Production in Tennessee
TN 626	Alternative Systems of Swine Production
TN 633(S-153)	An Economic Analysis of Alternative Marketing Strategies for Cotton Producers
TN 635	Changing Population and Agriculture in Tennessee, 1970-1980
TN 641	Utilization and Control of Land In and Around Rural Communities in Tennessee
TN 642	An Economic Analysis of Livestock Auction Markets in Tennessee
TN 648(S-166)	The Impact of Changing Costs, Institutions and Technology on the Southern Dairy Industry
TN 651(S-158)	Improving Community Services in Nonmetropolitan Counties in the South
TN 654	Alternative Pricing Methods for Tennessee Livestock Producers
TN 658	Health Care Services in Rural Tennessee
TN 671	Strategies for Improving the Effectiveness of Soil Erosion Control and Rural Water Quality
TN 677	Use of No-Tillage and Other Agricultural Practices by Tennessee Farm Operators
TN 681(S-103)	Regional Advantages in Producing and Marketing Woody Ornamentals
TN 683(S-172)	The Economics of Improving Productivity in the Livestock-Meat Systems in the South
TN 685(S-176)	Marketing Systems for Grains and Soybeans
TN 691	Farm Business Performance
TN 694(S-178)	Structural and Operational Efficiency of the Fruit and Vegetable Production-Marketing System
TN 699	Business Organization Strategies for Management, Growth, and Intergenerational Transfer - Farm/Business
TN 713	Economic Evaluation of Technological and Institutional Changes on Farmers in Tennessee

- TN 725(S-190) Disturbances to Price Discovery—Risk Management by Marketing Firms in Southern Agriculture

Projects Concluded in 1983

- TN 553 (S-141) Housing for Low and Moderate Income Families
TN 554 Rural Economics and the Structure of the Agricultural Production Sector in Tennessee
TN 663 (S-148) Changing Structure of Agriculture: Causes, Consequences, and Implications
TN 609 Migration and Other Demographic Changes of the Tennessee Rural Population
TN 654 Alternative Pricing Methods for Tennessee Livestock

***Tennessee Agricultural Experiment Station
Bulletins and Reports—1983***

- Badenhop, M.B. 1) Performance Report and 2) Financial Reports of: Fulbright-Hays Group Project Abroad to India, "Seminar on Agriculture, Energy and the Indian Society," June 9-July 21.
- Badenhop, M.B., and Neal Walker. Thai Project 1983, End-of-Tour Report, December (forthcoming).
- Badenhop, M.B., and Travis D. Phillips. Costs of Producing and Marketing Container-Grown Woody Landscape Plants: The Pfister Juniper, Southern Cooperative Series Bulletin No. 299.
- Blisard, Noel, and Luther H. Keller. An Economic Analysis of Terraces as an Erosion Control Alternative on West Tennessee Farms, Bulletin No. 628.
- Brooker, John R. Purchasing Practices of Wholesale Produce Handlers in Tennessee, Research Report No. 83-03, March.
- Brooker, John R., James E. Epperson, Jerry W. Law, and Lanny Bateman. Market Access Considerations Regarding Produce Sales from Growers to Wholesale Handlers, Southern Cooperative Series Bulletin No. 295, November.
- Dickerson, W.L., M.B. Badenhop, and J.W. Day. Cost of Producing and Marketing Rooted Cuttings of Three Woody Ornamental Species in Tennessee, 1980, Bulletin No. 624, April.
- Dodson, C.B., and D.L. McLemore. An Economic Analysis of Alternative Grain Purchase and Storage Strategies for Tennessee Hog Producers, Bulletin No. 623, April.
- Holloway, J.W., W.T. Butts, and D.L. McLemore. Phenotype X Nutritional Environmental Interaction in Economic Efficiency of Angus Cows Grazing Fescue-Legume or Fescue Pastures, Bulletin No. 626, November.
- Hunter, David L., and Luther H. Keller. Economic Evaluation of Alternative Crop and Soil Management Systems for Reducing Soil Erosion Losses on West Tennessee Farms, Bulletin No. 628, November.
- Iniodu, Peter, and M.B. Badenhop. Credit and Agricultural Development: The Case of Cross River State, Nigeria, International Report No. 2, pp. 1-33.

- McManus, B.R., and Donald A. Cunningham. Economic Trends in the Tennessee Cattle Industry, Research Report No. 83-11, August, 57 pp.
- Morris, Don, Alan Miller, and C.M. Cuskaden. Soybean Production Systems in Tennessee Bulletin No. 629.
- Parker, Russell, and Luther H. Keller. Factors Affecting the Optimum Size of Liquid Manure Storage Systems on Dairy Farms, Bulletin No. 614, April.
- S-103 Technical Committee. Costs of Establishing and Operating Container Nurseries Differentiated by Size of Firm and Species of Plant in USDA Climatic Zone Six, Southern Cooperative Series Bulletin No. 301, November.
- Spielman, Kimberly, Dan McLemore, and Glen Whipple. Cost of Operation of Tennessee Livestock Auction Markets, Bulletin No. 620, March.
- Todd, R.W. The Federal Gift and Estate Tax Structure, Bulletin No. 617, April, 27 pp.
- Walker, Neal, and Robert H. Orr. Farmers Problems and the Role of Government in Agriculture as Viewed by Tennessee Farmers, Bulletin No. 622, April.
- Whipple, G.D., and M.D. Gray. Welfare Effects of Lowered Dairy Price Support Levels, Research Report No. 83-13, November.
- Whipple, Glen D., Philip M. Davison, and Ola G. Sanders. Consumer Acceptability of Reconstituted Fluid Milk, Bulletin 613, April.
- Williams, Robert, John Adrian, Morris White, Irving Dubov, *et al.* Price Discovery at the First Buyer State of the Soybean Market System in the South, Southern Cooperative Series Bulletin No. 287, August.

Tennessee Farm and Home Science Articles

- Leuthold, Frank O. "Commuting Patterns of Tennessee Residents," No. 126.
- Leuthold, Frank O. "Stabilization of Tennessee Agricultural Employment," No. 127.
- Orr, Robert H., and Maryanne Lynch. "Rural Public Transportation—Profile of Potential Client Characteristics Among Rural Elderly," No. 125.

Journal Articles

- Brooker, John R. "Procurement and Marketing Practices of Independent Fruit and Vegetable Wholesalers," *Journal of Food Distribution Research*, Vol. XIV, No. 3, Food Distribution Research Society, September.
- Hunter, David L., and Luther H. Keller. "Economic Evaluation of Alternative Crop and Soil Management Systems for Reducing Soil Erosion on West Tennessee Farms," *Southern Journal of Agricultural Economics*, Vol. 15, No. 1, July (abstract).
- McLemore, Dan, Glen D. Whipple, and Kimberly Spielman. "OLS and Frontier Function Estimates of Long Run Average Cost for Tennessee Livestock Auction Markets," *Southern Journal of Agricultural Economics*, Vol. 15, No. 2, December.
- Musser, Wesley N., Holly Tyan, and John R. Brooker. "An Econometric Analysis of Use of Forward Contracting by Southern Cotton Producers," *American Journal of Agricultural Economics*, Vol. 65 (abstract).

- Whipple, Glen D., P.M. Davidson, and O.G. Sanders. "Economic and Consumer Acceptability of a Reconstituted Fluid Milk Product," *Journal of Dairy Science*, Vol. 66, pp. 381-389, March.
- Whipple, Glen D. "An Analysis of Reconstituted Fluid Milk Pricing Policy," *American Journal of Agricultural Economics*, Vol. 65, pp. 207-213, May.
- Whipple, Glen D., and Morgan Gray. "Welfare Effects of Alternative Price Support Levels," *Southern Journal of Agricultural Economics*, Abstract, Vol. 15, p. 167, July.
- Whipple, Glen D. "Market Stability and the Welfare Effects of Dairy Market Regulation," *American Journal of Agricultural Economics*, Abstract, Vol. 65, December.

M.S. Theses

- Bishop, Michael B. "Alternative Models for Predicting the Futures Market Basis for Tennessee Feeder Cattle," under Dan L. McLemore, December.
- Clark, James E., Jr. "Analysis of Managerial Factors for Dairy Farmers," under B.R. McManus, June.
- Jamnick, Susan F. "A Logit Analysis of No-Till Users in Henry County, Tennessee," under Thomas H. Klindt, August.
- Morris Richard Donald. "Soybean Production Systems Used in West Tennessee: 1976 and 1981," under C. Mike Cuskaden, March, 90 pp.
- Sasscer, Carroll, Jr. "An Economic Analysis of Selected Insect Management Strategies for Burley Tobacco," under S. Darrell Mundy, June.
- Sawyer, David G. "An Evaluation of Targeting as a Strategy for Attaining Objectives of Conservation and Water Quality in the North Fork Forked Deer Watershed," under William M. Park, June.

Other Writings

Bulletins/Publications

- Dubov, Irving. "Agriculture," An Economic Report to the Governor of the State of Tennessee, Tennessee State Planning Office, Nashville.
- Dubov, Irving, *et al.* "Outlook for Specific Industry," Survey of Business, Center for Business and Economic Research, University of Tennessee, Vol. 18, No. 3.

Papers Presented and/or Proposed

- Badenhop, M.B., and Ronald Brown. "Institutional Development to Meeting Changing Agricultural Needs in Rural Areas of Thailand," working paper (proposal) for the Maejo Institute of Agricultural Technology, Chiang Mai, Thailand, January.
- Klindt, Thomas H., and William M. Park. "Agricultural Pressures on Forest Resources," paper presented at the annual meeting of the Tennessee-Kentucky Section of the Society of American Foresters, Knoxville, Tennessee.

- Klindt, Thomas H., and William M. Park. "Forestry and Agricultural Competition for Land in the Southeast," paper presented at the annual meeting of the Southern National Resource Economics Committee, Knoxville, Tennessee.
- Park, William M. "Agricultural Policy After PIK," paper presented at the annual meeting of the Tennessee Society of Farm Managers and Rural Appraisers, Knoxville, Tennessee.
- Park, William M. "Economic Issues in Solid Waste Management," paper presented at the annual meeting of the Southern Natural Resource Economics Committee, Biloxi, Mississippi.
- Park, William M., and David G. Sawyer. "An Analysis of Targeting Soil Erosion Control Efforts to and within a Critical Watershed," paper presented at the annual meeting of the American Agricultural Economics Association, West Lafayette, Indiana.
- Phillips, Travis D., and M.B. Badenhop. "South's Competitive Advantage in Producing Junipers," paper given at the Research Conference of the Southern Nurserymen's Association, Atlanta, Georgia, August 6-8. To be published in the 1983 Proceedings Issue of the Southern Nurseryman's Association.

Reports/Proceedings

- Park, William M. "Nonpoint Pollution—Implications of Its Nature and Interdependencies for Future Policy," Future Waves: Water Policy in the South, proceedings of a regional conference, Southern Rural Development Center in cooperation with the Farm Foundation, Mississippi State, Mississippi, pp. 93-105.
- Walker, Neal. "Problems in the Design, Implementation and Evaluation of Extension Programs for Transitional Targets—An Example from Thailand," proceedings of 1983 Farming Systems Symposium, Kansas State University (forthcoming).

AGRICULTURAL ENGINEERING

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 543	Management Practices for Erosion and Sedimentation Control
TN 546	Engineering Systems and Energy Needs for Cotton Production (contributing to Regional Project S-134)
TN 560	Animal Waste Utilization and Treatment Systems (contributing to Regional Project S-144)
TN 577	Curing, Storing and Feeding High Value Hay in Large Packages
TN 587	Use of the Earth as an Energy Source or Sink for Heating and Cooling Buildings
TN 602	Energy Reduction for On-Farm Processing of Agricultural Products (contributing to Regional Project S-147)

- TN 604 Optimize Efficiency of Energy Utilization in Agricultural Housing Systems (contributing to Regional Project S-149)
- TN 622 Energy Use Analysis and Application of Conservation Practices on Tennessee Farms
- TN 629 Energy Conservation in Harvesting and Curing Air Cured Tobacco
- TN 653 Energy Reduction for Crop Production Systems (contributing to Regional Project S-160)
- TN 661 The Application of Engineering Principles to Animal and Biological Systems
- TN 662 Physical Properties of Blended Yarns and Their Constituent Fibers
- TN 680 Effects, Mechanisms, and Control of Erosion and Sediment from Agricultural and Forest Land (contributing to Regional Project S-174)
- TN 701 Analysis of Sheet Erosion Detachment and Transport Processes
- TN 709 On-Site Wastewater Renovation

Bulletins, Articles, and Reports—1983

- Bledsoe, B.L., K.L. Pierce, Jr., D.K. Rosen and B.A. McGraw. Design Changes Suggested by Construction and Evaluation of a Multi-Use Solar Dryer for Hay. Proceedings of 3rd Annual Solar and Biomass Workshop, Atlanta, GA. USDA Southern Agricultural Energy Center, Tifton, GA. 1983.
- Bledsoe, B.L. Looking for a Better Way—UT Ag Engineering Research. Tennessee Farmer, XXXI: 11, pp. 6, 8, 24. 1983.
- Henry, Z.A. and D.G. Mundy. Forced Air Curing of Close-spaced, Stalk-cut Burley Tobacco. The 30th Tobacco Workers Conference. 1983.
- Shelton, C.H., F.D. Tompkins, and D.D. Tyler. Soil Erosion from Five Soybean Tillage Systems. Journal of Soil and Water Conservation 38(5): 425-428. 1983.
- Smith, Horace, Z.A. Henry, and D.M. Mundy. Journal of Tobacco Producers Delegation to the Peoples Republic of China. People to People International. Spokane, Washington. 1983.
- Tompkins, F.D. Innovations in No-till Planting and Spraying Equipment. Proceedings of the Sixth Annual Southeastern No-Till Systems Conference. pp. 47-50. 1983.
- Tompkins, F.D. Looking for a Better Way—UT Ag Engineering Research. Tennessee Farmer XXXII: 1. pp. 18, 20, 24. 1983.
- Tompkins, F.D., D.J. Canary, C.A. Mullins, and J.W. Hilty. Effect of Application Rate, Spray Pressure, and Nozzle Arrangement on Coverage of Plant Foliage and Control of Snap Bean Rust with Chlorothalonil. Plant Disease 67(9): 952-953.
- von Bernuth, R.D. and J.R. Gilley. Evaluation of Center Pivot Application Packages Considering Droplet Induced Infiltration Reduction. Paper No. 83-2516-ASAE Winter Meeting, Chicago, ILL. 1983.

- von Bernuth, R.D. How to Evaluate Drip Irrigation Systems. Lake Company, Bakersfield, CA. 1983.
- von Bernuth, R.D. Wheelmove Sprinkler Irrigation. Lake Company, Bakersfield, CA. 1983.
- von Bernuth, R.D. Drip Irrigation. Lake Company, Bakersfield, CA. 1983.
- von Bernuth, R.D. Mini-Micro Sprinkler Irrigation. Lake Company, Bakersfield, CA. 1983.
- Wilhelm, L.R., F.D. Tompkins, and C.A. Mullins. Air Flow Resistance of Bean and Pea Pods. Transactions of the ASAE 26 (3): 946-949. 1983.

ANIMAL SCIENCE

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 511(S-131)	Eggshell Quality in Avian Species
TN 528	Factors Affecting Nutrient Consumption and Digestibility of Grazed and Harvested Forages
TN 529	Flexibility in Beef Production from Forage in Tennessee
TN 535	Absorption of Minerals in Large Animals
TN 538	Effect of Heterosis on Nutritional Efficiency of Beef Production
TN 559(S-145)	Nutritional Systems for Swine to Increase Reproductive Efficiency
TN 563	Management of Purchased Feeder Pigs
TN 586	Magnesium-Potassium-Carbohydrate-Hormonal Interrelationships to Hypomagnesemia in Ruminants
TN 598	Adrenocorticotrophin Involvement in Stress Related Early Embryonic Mortality in Swine
TN 607	Development of Low Protein Broiler Diets
TN 614	The Effect of Ketone Bodies on Lipolysis During Fasting, Pregnancy and Lactation in Ruminants
TN 627	Genetic Variation in Nutrient Intake and Utilization of Grazing Beef Females as Related to Genotype x Environment Interaction
TN 630	Improved Sorting Techniques for Plain Feeder Calves
TN 631	Factors Influencing Marked-Transit and Post-Transit Health and Performance of Southeastern Feeder Calves
TN 637	Alternative Systems of Swine Production
TN 639(S-10)	Breeding Methods for Beef Cattle in the Southern Region
TN 640(S-49)	Genetic Methods of Improving Dairy Cattle for the South
TN 643	Evaluation of Various Forage Systems in Reducing Cost of Milk Production
TN 644	Effects of Confinement and Nutrition of Lactating and Dry Cows on Cow Health and Performance

- TN 657 Utilization of Conventional and By-Product Feeds in Total Mixed Rations for Dairy Cattle
- TN 667(S-121) Etiology and Control of Hypomagnesemic Tetany in Ruminants Utilizing Cool Season Grasses
- TN 670 The Effect of Different Kinds of Pasture and Grain Feeding Periods on Beef Carcass Quantitative and Qualitative Traits and Palatability Characteristics (in cooperation with Food Technology and Science Dept.)
- TN 673 Changes in Platelets and Hormones in Pregnant or Lactating Ewes
- TN 683(S-172) The Economics of Improving Productivity in the Livestock Meat Systems in the South
- TN 704 Improvement of Production Efficiency in Straightbred Beef Herds Through Heifer Selection
- TN 707 Management and Productivity of Fungus-free and Fungus-infested Fescue Pastures
- S 90 Use of Highly Prolific Breed x Mutton Breed Crosses to Improve Lamb Production in Tennessee

Projects Concluded in 1983

- TN 541 Relationship of Morphological Development of Joints and Long Bones to Skeletal Soundness of Growing Swine
- TN 551 The Etiopathology of Avian Glaucoma
- TN 552 Vitamin Injections for Beef Cows
- TN 613 Studies in Cysteine Bioavailability in Heat-Treated Proteins

Bulletins, Articles, and Reports—1983

- Abner, W.R., Jr., J.B. McLaren, W.A. Phillips, R.W. Wills and L.M. Safley. 1983. Influence of preshipment rate of gain on subsequent response to Ralgro implantation by market-transit stressed steers. *Tenn. Farm & Home Sci.* 127:5-9.
- Armstrong-Backus, C.S., F.M. Hopkins and H. Eiler. 1983. The uterotonic effect of Prostaglandin F₂-alpha and oxytocin on the postpartum cow. 64th Annual Meeting of the Conference of Research Workers in Animal Disease. Chicago, IL, No. 93.
- Baxter, J.D., M.J. Montgomery, D.R. Waldo and J.R. Owen. 1983. Effect of method of feeding protein and protein insolubility on milk production by Jersey cows. *J. Dairy Sci.* 66:2093-2099.
- Beaver, E.E., J.W. Holloway, W.R. Backus and W.T. Butts, Jr. 1983. Seasonal patterns in digestibility and intake for lactating cows grazing fescue legume or fescue pastures as estimated by two methods. *J. Anim. Sci.* 57(Suppl. 1):278.
- Bell, B.R. 1983. Understanding PD 82. *Dairy Herd Mgt.* 20(8): 19.
- Bell, M.C. 1983. Prevention of hypomagnesemia tetany in beef cattle. In *Proc. Internat. Sym on Mg. in An. Nutri.*, J.P. Fontenot, Ed., p. 197-210.
- Butts, W.T. 1983. Seventy-five years of progress in beef cattle breeding research in the Southern Region. *J. Anim. Sci.* 57 (Suppl. 1): 69.

- Carlisle, R.J., H.A. Fribourg and J.B. McLaren. 1983. Extending the grazing season for backgrounded steers using bermudagrass, tall fescue, and orchardgrass pasture combinations with clover or N fertilization. *Tenn. Farm & Home Sci.* 126:9-13.
- Dehority, B.A., W.S. Damron and J.B. McLaren. 1983. Occurrence of the rumen ciliate *Oligoisotrachi bubali* in domestic cattle (*Bos taurus*). *Applied and Envir. Micro.* 45:1394.
- Dowlen, H.H., D.O. Richardson and J.R. Owen. 1983. Effect of age and weight of Jersey heifers at first breeding on fertility, production and mature size. Annual Meeting of the Southern Division, American Dairy Science Association.
- Dowlen, H.H., R.L. Murphree, D.O. Richardson and J.R. Owen. 1983. Effect of immediate post-partum uterine treatment on subsequent reproductive efficiency. *Theriogenology* 19-6:811.
- Eiler, H., J.W. Oliver, A.M. Legendre and C.S. Armstrong-Backus. Cortisolemia response of hyperadrenocorticoid dogs to the combined dexamethasone suppression/ACTH stimulation test. 64th Annual Meeting of the Conference of Research Workers in Animal Disease. Chicago, IL, No. 102.
- Eiler, H. and W.A. Lyke. 1983. Retention of calcium in the intestinal wall of the rabbit by treatment with a glucocorticoid. *Am. J. Physiology* 245:E143-E147.
- Eiler H. and Cindy S. Armstrong. 1983. Clearance of exogenous L-Thyroxine and exogenous triiodothyronine in bovine ejaculate. Time-course relationship. Society for the Study of Reproduction. Sixteenth Annual Meeting, Cleveland, OH, No. 263.
- Erickson, B.H. and G.G. Hall. 1983. Stem-spermatogonia renewal and mitotic activity following γ -irradiation in mouse and rat. *Mut. Res.* 108:317-335.
- Fernandez, J.M. and R.N. Heitmann. 1983. Effects of β -hydroxybutyrate on ketogenesis in normal and diabetic sheep. *Fed. Prod.* 42:532.
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- Godkin, J.D. and Bazer, F.W. 1983. Interactions of conceptus protein with maternal uterine endometrium during early pregnancy. Society for the Study of Reproduction, 16th Annual Meeting, Cleveland, OH.
- Godkin, J.D., F.W. Bazer and R.M. Roberts. 1983. The effects of conceptus proteins on luteal function during early pregnancy in sheep. *J. Anim. Sci.* 57(Suppl. 1):339.
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- Hamlett, P.J., J.B. McLaren, J.R. Ford, L.M. Safley and L.G. Bettison. 1983. Supplemental potassium to reduce shipping shrink and aid feedlot adaptation. *J. Anim. Sci.* 57(Suppl. 1):395.
- Heitmann, R.N. and D.M. Britton. 1983. Digestibilities of whole stillage ensiled with mature fescue hay. *Tenn. Farm & Home Sci.* 127:13-15.

- Heitmann, R.N. and D.R. Metzler. 1983. Effects of β -hydroxybutyrate on plasma free fatty acids and insulin in mature wethers. *Fed. Proc.* 42:532.
- Henson, M.C., H.G. Kattesh, J.P. Hitchcock and S.A. Kincaid. 1983. The effects of dietary selenium on growth and selected reproductive parameters in young boars. *Anim. Prod.* 37:401-407.
- Hitchcock, J.P., F.B. Masincupp and R.L. Freeland. 1983. Effect of receiving diet and antibiotic and anthelmintic medication on performance of purchased feeder pigs. *J. Anim. Sci.* 57(Suppl. 1):396.
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CHILD AND FAMILY STUDIES

<i>Proj. No.</i>	<i>Research Project Title</i>
TN 623	The Familial Antecedents of Adolescent Independence
TN 682 (S-171)	Dynamics of Life Plans and Attainment of Low-Income Youth: A Longitudinal Analysis

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ENTOMOLOGY AND PLANT PATHOLOGY

Proj. No.

Research Project Titles

TN 557	Susceptibility of Cotton Cultivars to Seedling Pathogens
TN 571	Evaluation of Insecticides for Use on Minor Crops in Tennessee
TN 573	Control of Tobacco Insects
TN 578	Etiology & Control of Small Grain Diseases
TN 580	Diseases of Ornamentals and Nursery Crops
TN 590	Detection and Control of Soybean Diseases
TN 594	Etiology, Ecology, and Control of Cotton Diseases
TN 595	Biology, Ecosystem Dynamics, and Control of Soybean Diseases
TN 624(S-157)	Tactics for Management of Soybean Pest Complexes
TN 625(S-154)	Variability of Root-knot and Cyst Nematodes and Factors Influencing their Population Dynamics
TN 663	Investigation of the Leaf Rust Disease of Snapbean
TN 666	Biological Control of Scale Insects
TN 672	Ecology & Management of Cotton Insects
TN 92 (S-85)	Pesticide Impact Assessment Research & Data Analysis
TN 693	Pasture & Forage Insect Pest Ecology & Control
TN 700(S-181)	Integrated Arthropod Management for Livestock & Poultry in the Southern Region

- TN 714 Economic Thresholds Toxicology & Management of Fall Armyworm and European Corn Borer in Field Corn
- TN 715 The Ecological & Physiological Aspects of the Spread of *Morax-ella bovis* by *Musca autumnalis*
- TN 717 Insect Pest Management for Vegetable Crops
- TN 719 Distribution and ecology of Phytoparasitic Nematodes in Tennessee
- TN 722 Virus of Small Grains
- TN 726(S-186) Management of Soil Microorganisms affecting the Health and Vigor of Plants

Research Projects Concluded

- TN 525 (S-90) Rhizosphere Ecology as Related to Plant Health and Vigor
- TN 533 Identification & Pathogenicity of Selected Plant-Parasitic Nematodes in Tennessee
- TN 536 Role of Face Flies in Epidemiology of Infectious Bovine Keratoconjunctivitis (IBK)
- TN 537 Control of Lepidopterous Pests on Field Corn
- TN 544 Management of Vegetable Insect Pests
- TN 87 Pesticide Impact Assessment Research & Data Analysis
- TN 665 Biology & Ecology of Biting Flies in Tennessee

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FOOD TECHNOLOGY AND SCIENCE

Proj. No.
TN 592

Project Titles

Control of Aflatoxin and Related Mycotoxins in Agricultural Commodities Currently Processed in Finished Foods

- TN 596 Lipids and Their Relationship to Food Quality
- TN 600 Physical, Chemical and Histological Traits of Muscle Associated With Composition and Palatability
- TN 634 Utilization of Proteins and Fats from Unconventional Sources in Manufactured Meat Products
- TN 647 Maximizing the Use, Nutritive Quality and Consumer Acceptance of Sweet Potatoes and Their Products
- TN 659 Improvement of Honey Produced in Tennessee
- TN 670 Marketability and Acceptability of Beef Produced Under Forage and Forage-Grain Management Systems
- TN 676 Evaluation of the Quality of Fresh and Processed Fruit
- TN 698 Nutritive and Quality Evaluation of the Southern Pea (*Vigna unguiculata*) and Some of Its Products
- TN 702 The Use of Sodium Substitutes in the Manufacture of Dairy Products
- TN 721 Characterization of Antimicrobials in Foods
- S 88 Pesticides in/on Raw and Processed Foods
- S 89 Processing Methods for Dairy Products: Efficiency and Relationship to Product Quality

Projects Concluded in 1983

- TN 547 Quality and Shelf Life of Food Products in the Marketing Channels
- TN 593 Antimicrobial Properties of Naturally Occuring Compounds and Currently Approved Food Additives

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FORESTRY, WILDLIFE, AND FISHERIES

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 599	Applied Physiology of Economically Important Fishes
TN 601	Reclamation of Drastically Disturbed Soils
TN 632	Breeding Strategies for Genetic Improvement of Commercial Forest Trees in the South
TN 660	Game Fish Management in Tennessee Waters
TN 668	Warmwater Aquaculture
M-S 28	Wood Quality Evaluation by Gamma-Ray Densitometry
M-S 29	Economic Impact of Death Taxes on Tennessee's Timber Resources
M-S 30	Effects of Manipulating Forest Habitats Upon Physical Condition of Bobwhite Quail
M-S 31	Cultural Techniques for Improving the Survival and Growth of Trees
M-S 32	Cooperative Hunting Programs on Small, Private Forests in Tennessee
M-S 33	Visual Preferences of Recreationists During On-Site Engagements in Forest Environments
M-S 34	Identifying and Analyzing Forest Resource Futures
M-S 35	Containerized and Nursery Culture of Forest Tree Seedlings
M-S 36	Effects of Air Pollution on Radial Growth and Wood Density of Trees
M-S 37	Wildlife Population Responses to Forest Management Practices in the Southern Appalachian Forests
M-S 38	Biometrical Procedures for Tennessee Forest Management

- M-S 39 The Impact of Habitat Changes on Wildlife Populations in Southeastern Forests
- S 30 The University of Tennessee Arboretum
- S 91 Responses of Wildlife to Habitat Modifications on Forests and Associated Lands in Tennessee

Projects Concluded in 1983

- TN-1-2-U58-0 Digestibility of High Energy and High Protein Feedstuffs for Channel Catfish
- M-S 23 Breeding of Upland Hardwoods
- M-S 24 Breeding of Coniferous Trees
- M-S 25 Defect Estimation of East Tennessee Hardwoods
- M-S 27 Natural History of Large Mammals in the Southern Appalachian Forests

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NUTRITION AND FOOD SCIENCES

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 572	Factors Affecting Food Habits of Adolescents and Young Adults
TN 605	Nutritional Health of Adolescent Females
TN 611	Interrelationship Between Food Restriction and Metabolism of Drugs and Chemicals
TN 655	Effect of Dietary Sulfur on Drug Efficacy
TN 656	Effect of Dietary Sulfur on the Formation and Accumulation of Polyanimes
TN 689	Effect of Feed Restriction, Exercise and Age on Fat Synthesis, Body Composition and Survival of Rats
TN 690	Microwave Heating: Effects on Physical, Chemical and Sensory Properties of Selected Foods
TN 720	Functionality of Barley Flour in Whole-Grain Yeast Bread

8100735 Availability of Orally Administered Carnitine
(USDA)

Projects Concluded in 1983

TN 519 The Effects of Changing Food Prices and Other Intervening
Variables on Food Acceptance

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ORNAMENTAL HORTICULTURE AND LANDSCAPE DESIGN

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 584	Histochemical Characterization of Cytoplasmic Globules in Plants
TN 620	Evaluation of New Cultivators, Culture and Mechanical Practices in Turfgrass
TN 621	Pesticide Evaluations and Their Effects on Turfgrass
TN 703	Propagation of Ornamental Plants
TN 706	Bedding Plant Production Systems and Varietal Evaluations
TN 708	Chemical Control of Plant Growth in Florists' Crops
TN 711	Field Nursery Production Systems
TN 712	Nursery Container Plant Production Systems
TN 716	Post-Harvest Handling of Nursery Stock

Projects Concluded in 1983

- TN 370 Shade Tree Cultivars
 TN 534 Production Systems for Nursery Stock
 TN 581 Chemical Control of Plant Growth in Florist Pot and Bedding Plants

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PATHOBIOLOGY

Proj. No.	Research Project Titles
TN 669(S-169)	Influences of Immunological Factors on Neonatal Diseases in Food Producing Animals and Horses
TN 675 AHD	Chronological Development of the Immune Response of the Bovine Lower Respiratory Tract to <i>Pasteurella Hemolytica</i>
TN 686	Role of Bovine Virus Diarrhea Virus Vaccine Strains in Bovine Respiratory Tract Disease

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PLANT AND SOIL SCIENCE

Proj. No.	Research Project Titles
TN 406	Small Grain Improvement Through Breeding (Wheat, Oats, Barley, and Rye)
TN 408	Corn Improvement
TN 414	Field Crop Variety Evaluation
TN 428	Soil Survey and Its Relation to Behavior of Different Soils Under Various Uses
TN 444	Forage Crops Ecology and Management
TN 476	Soybean Breeding
TN 561	Crop Yield as Affected by Plant Environment
TN 562	Effect of Soil, Soil Fertility Level, Added Nutrients and Season on Crop Yield
TN 564	Effects of Applied Waste on Soils and Crops
TN 565	Availability of Secondary Nutrients in Tennessee Soils
TN 566	Evaluation and Breeding of Forage Legumes
TN 570	Cotton Production Practices
TN 574	Cotton Seed and Fiber Development
TN 575	Plant Response to Herbicides and Antidotes
TN 576	Plant Growth Regulator Effects on Fruit, Vegetable, and Agronomic Crops

- TN 579 Forage Crop Quality Under Different Management and Environments
- TN 582 Vegetable Crop Production
- TN 589 Effects of Soil pH Levels on Crop Growth
- TN 591 Breeding for Disease Resistance in Dark Tobacco
- TN 597 Development and Evaluation of Rootstocks for Peaches (contributing to Regional Project S-97)
- TN 610 Grape Germplasm Evaluation for Ecological Utilization (contributing to Regional Project S-142)
- TN 612 Significance and Distribution of Mineral Components in Southern Soils (contributing to Regional Project S-152)
- TN 618 Fruit Crop Investigation
- TN 638 Weed Control in Forage Crops
- TN 645 Germplasm Development in Cool Season Forage Grasses
- TN 649 Field Crop Responses to Plant Nutrient Application on Soils
- TN 652 Influence of Crop Herbicide Management on Weed Population Dynamics and Subsequent Crop Physiology (contributing to Regional Project S-159)
- TN 678 Mycotoxins of Corn and Other Feed Grains (contributing to Regional Project S-17)
- TN 679 Rootstock and Interstem Effects on Pome and Stone Fruit Tree Growth and Fruiting (contributing to Regional Project NC-140)
- TN 684 Agricultural Meteorology and Climatology for Production in the Southern Region (contributing to Regional Project S-173)
- TN 692 Weed Control in Field and Horticultural Crops
- TN 695 Cellular and Molecular Genetics for Crop Improvement (contributing to Regional Project S-179)
- TN 696 Biology, Epidemiology, and Control of Viruses and Mycoplasma-Like Organisms Causing Diseases of Corn and Sorghum (contributing to Regional Project S-70)
- TN 697 Plant Germplasm (contributing to Regional Project S-9)
- TN 705 Life History, Population Dynamics, and Interference: A Basis for Understanding Weed Biology (contributing to Regional Project S-183)
- TN 710 Quantifying Past Erosion and Evaluating Erosion and Cover Crop Effects on Yield
- TN 718 Burley Tobacco Genetics, Breeding, and Cultural Practices
- Projects Concluded in 1983**
- TN 506 Burley Tobacco Genetics and Breeding
- TN 540 Soil and Crop Management Systems for Soil Conservation and Erosion Control

TN 583 Fertilization and Cultural Practices to Improve Tobacco Safety

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RURAL PRACTICE

Proj. No.	Research Project Titles
TN 650 (NC-107)	Bovine Respiratory Diseases
TN 674 AHD	Mechanisms of Immunological Protection and Vector Transmission of <i>Moraxella Bovis</i> in Cattle

TEXTILES, MERCHANDISING AND DESIGN

Proj. No.	Research Project Titles
TN 646	Effects of Functional Textile Finishes on Comfort and Protection of Consumers
TN 664	Integrated Design Research for Household Energy Conservation

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Locations at Oak Ridge, Tullahoma, and Wartburg, R.M. Evans, Superintendent

Highland Rim Experiment Station
Springfield, L.M. Safley, Superintendent

Knoxville Experiment Station
Knoxville, John Hodges III, Superintendent

Martin Experiment Station
Martin, H.A. Henderson, Superintendent

Middle Tennessee Experiment Station
Spring Hill, J.W. High, Jr., Superintendent

Milan Experiment Station
Milan, John F. Bradley, Superintendent

Plateau Experiment Station
Crossville, R.D. Freeland, Superintendent

Tobacco Experiment Station
Greeneville, Philip P. Hunter, Superintendent

West Tennessee Experiment Station
Jackson, J.F. Brown, Superintendent

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

J.A. Martin, Professor and Head of
Department

M.B. Badenhop, Professor

K.D. Banker, Graduate Research
Assistant

W.N. Blisard, Graduate Research
Assistant

J.R. Brooker, Professor

T.J. Bundy, Graduate Research
Assistant

C.L. Cleland, Professor and
Ombudsman

C.M. Cuskaden, Associate Professor

N.C. Davis, Graduate Research
Assistant

Irving Dubov, Professor

T.E. Glasgow, Graduate Research
Assistant

M.D. Gray, Research Associate

J.M. Gross, Graduate Research
Assistant

Cynthia G. Hart, Graduate Research
Assistant

J.T. Ingram, Graduate Research
Assistant

L.H. Keller, Professor

T.H. Klindt, Professor

F.O. Leuthold, Professor

T.A. Levis, Graduate Research
Assistant

Lynn B. Marrale, Graduate Research
Assistant

W.D. McBride, Graduate Research
Assistant

Emily A. McClain, Graduate Research
Assistant

D.L. McLemore, Professor

B.R. McManus, Professor

C.E. Meier, Graduate Research
Assistant

R.D. Morgan, Graduate Research
Assistant

S.C. Morse, Graduate Research
Assistant

S.D. Mundy, Professor

R.H. Orr, Associate Professor

W.M. Park, Assistant Professor

R.M. Ray, Associate Professor

C.B. Sappington, Professor

C.M. Sasscer, Research Associate

D.E. Terry, Graduate Research
Assistant

L.C. Thompson, Graduate Research
Assistant
R.W. Todd, Associate Professor
O.N. Walker, Associate Professor
G.D. Whipple, Assistant Professor

C.M. Williams, Graduate Research
Assistant
R.P. Williams, Graduate Research
Assistant

AGRICULTURAL ENGINEERING

D.H. Luttrell, Professor and Head of
Department
B.L. Bledsoe, Professor and Associate
Head of Department
V.H. Ayers, Graduate Research
Assistant
D.J. Barber, Graduate Research
Assistant
D.O. Baxter, Assistant Professor
D.E. Bell, Graduate Research Assistant
K.E. Duckett, Associate Professor
R.S. Freeland, Graduate Research
Assistant
W.E. Hart, Instructor
Z.A. Henry, Professor
L.O. Hillon, Research Assistant
G.C. Hodge, Graduate Research
Assistant
D.W. Jones, Graduate Research
Assistant
T.E. Kirkemide, Graduate Research
Assistant
K.A. Kneisley, Graduate Research
Assistant

S.P. Manos, Graduate Research
Assistant
J.E. Maples, Research Assistant
J.C. McNeal, Graduate Research
Assistant
C.R. Mote, Associate Professor
T.G. Prather, Extension Assistant
D.K. Rosen, Graduate Research
Assistant
C.H. Shelton, Professor
S.L. Shoulders, Graduate Research
Assistant
F.D. Tompkins, Associate Professor
R.D. von Bernuth, Associate Professor
G.R. Walker, Graduate Research
Assistant
L.R. Wilhelm, Associate Professor
J.B. Wilkerson, Instructor
A.R. Womac, Graduate Research
Assistant

ANIMAL SCIENCE

D.O. Richardson, Professor and Head
of Department
Cindy Backus, Graduate Research
Assistant
W.R. Backus, Associate Professor
J.A. Bacon, Research Associate
K.M. Barth, Professor
B.J. Bearden, Assistant Professor
B.R. Bell, Assistant Professor
M.C. Bell, Professor
Lisa Bettison, Graduate Research
Assistant
T.D. Bryson, Graduate Research
Assistant
W.T. Butts, Jr., Associate Professor¹

Louis Caldwell, Graduate Research
Assistant
Robert Cato, Graduate Research
Assistant
E.W. Culvahouse, Jr., Professor
M.C. Dixon, Research Associate
H.H. Dowlen, Assistant Professor
H. Eiler, Associate Professor
B.H. Erickson, Professor
M.E. Fryer, Research Associate
Paula Gaynor, Graduate Research
Assistant
Jack Glisson, Graduate Research
Assistant
J.D. Godkin, Assistant Professor

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

- B.B. Greene, Graduate Research Assistant
Nancy Sanders Greene, Graduate Research Assistant
J.D. Gresham, Associate Professor
Peggy Hamlett, Graduate Research Assistant
R.N. Heitmann, Assistant Professor
J.P. Hitchcock, Associate Professor
G.E. Jarboe, Research Associate
Jacqueline Johnson, Graduate Research Assistant
H.G. Kattesh, Assistant Professor
David Keltner, Graduate Research Assistant
E.R. Lidvall, Jr., Professor
W.A. Lyke, Research Associate
F.G. Masincupp, Associate Professor
J.R. McCurley, Research Associate
G.C. McGhee, Instructor
- Kathryn McKim, Graduate Research Assistant
J.B. McLaren, Professor
W.W. McNeill, Assistant Professor
J.K. Miller, Professor
M.J. Montgomery, Professor
Francis Mueller, Graduate Research Assistant
Nancy Ramsey, Research Assistant
C.K. Reynolds, Graduate Research Assistant
R.A. Reynolds, Research Associate
K.R. Robbins, Associate Professor
N.W. Robinson, Professor
Tina Shipley, Graduate Research Assistant
H.V. Shirley, Professor
Thomas Short, Graduate Research Assistant
R.R. Shrode, Professor
J.D. Smalling, Assistant Professor

CHILD AND FAMILY STUDIES

- Priscilla N. White, Professor and Head
Gary W. Peterson, Assistant Professor
Mary E. Stivers, Graduate Research Assistant

COMMUNICATIONS

- Bonnie P. Riechert, Assistant
Communications Specialist

ENTOMOLOGY AND PLANT PATHOLOGY

- Southards, Carroll J., Professor and Head
Baker, Anita, Graduate Research Assistant
Bernard, Ernest C., Associate Professor
Chambers, Albert Y., Associate Professor, Jackson, TN
Coleman, Russell, Graduate Research Assistant
Doyle, Joyce Holladay, Graduate Research Assistant
Gerhardt, Reid R., Professor
Goode, Kimberly, Graduate Research Assistant
- Hilty, James W., Professor
Hribar, Lawrence, Graduate Research Assistant
Johnson, Leander F., Professor
Klostermeyer, Lyle E., Assistant Professor
Lambdin, Paris L., Associate Professor
Lentz, Gary L., Associate Professor, Jackson, TN
Maslowski, Clarence, Graduate Research Assistant
Pless, Charles D., Professor
Ragan, Margaret, Graduate Research Assistant

Reed, Howard E., Associate Professor
 Shamiyeh, N.B., Research Associate
 Taylor, Nancy J., Pesticide Assessment
 Coordinator

Young, Lawrence D., Assistant
 Professor, Jackson, TN¹

FOOD TECHNOLOGY AND SCIENCE

J.T. Miles, Professor and Head of Department	T.J. Lowe, Graduate Research Assistant
J.L. Collins, Professor	S.L. Melton, Professor
P.M. Davidson, Associate Professor	D.K. Moore, Graduate Research Assistant
B.J. Demott, Associate Professor	J.R. Mount, Assistant Professor
F.A. Draughon, Associate Professor	E. Rico-Munoz, Graduate Research Assistant
G.H. Gregg, Graduate Research Assistant	G.N. Reynolds, Graduate Research Assistant
C.D. Holden, Graduate Research Assistant	M.J. Riemann, Associate Professor
H.O. Jaynes, Professor	W.T. Roberts, Graduate Research Assistant
T.L. Knox, Graduate Research Assistant	O.G. Sanders, Instructor
P.K. Lee, Graduate Research Assistant	D.A. Schoenrock, Graduate Research Assistant
H.D. Loveday, Associate Professor	

FORESTRY, WILDLIFE, AND FISHERIES

G. Schneider, Professor and Head of Department	Elizabeth S. Groton, Graduate Research Assistant
J.L. Byford, Professor and Associate Head of Department	J.P. Groton, Jr., Graduate Research Assistant
H.M. Bakir, Graduate Research Assistant	M.J. Gudlin, Graduate Research Assistant
Rebecca A. Benda, Graduate Research Assistant	W.E. Hammitt, Associate Professor
A.J. Brody, Graduate Research Assistant	B.C. Hastings, Graduate Research Assistant
P.B. Brown, Graduate Research Assistant	R.L. Hay, Associate Professor
E.R. Buckner, Professor	Cassandra L. Hohanshelt, Graduate Research Assistant
Janice R. Carmichael, Graduate Research Assistant	M.L. Hughes, Graduate Research Assistant
A.P. Clevenger, Graduate Research Assistant	M. Humphreys, Graduate Research Assistant
Karen L. Daniel, Graduate Research Assistant	M.S. Jamnick, Research Associate
B.L. Dearden, Associate Professor	K.G. Johnson, Research Associate
R.W. Dimmick, Professor	C.J. Keller, Graduate Research Assistant
E.F. Dougal, Assistant Professor	B.E. Keyes, Graduate Research Assistant
J.P. Durniak, Graduate Research Assistant	D.M. Kocka, Graduate Research Assistant

¹In cooperation with U.S. Dept. of Agriculture

R.L. Little, Associate Professor
 R.J. Longwitz, Graduate Research
 Assistant
 Candace Martino, Graduate Research
 Assistant
 C.D. McDonald, Research Associate
 Kathlyne A. McGee, Graduate
 Research Assistant
 H.G. Mealing, Graduate Research
 Assistant
 W.G. Minser III, Research Associate
 Tanya A. Minton, Graduate Research
 Assistant
 P.G. Moditz, Graduate Research
 Assistant
 W.W. Moschler, Jr., Research
 Associate
 J.A. Mullins, Jr., Research Associate
 B.G. Nottingham, Jr., Graduate

Research Assistant
 D.M. Ostermeier, Associate Professor
 M.R. Pelton, Professor
 J.C. Rennie, Associate Professor
 K.F. Schell, Associate Professor
 R.J. Strange, Associate Professor
 G.P. Tanner, Graduate Research
 Assistant
 T.A. Waldrop, Graduate Research
 Assistant
 W.G. Wathen, Graduate Research
 Assistant
 G.R. Wells, Associate Professor
 R.M. Wheat, Graduate Research
 Assistant
 J.L. Wilson, Professor
 F.W. Woods, Professor
 T.M. Young, Research Associate

NUTRITION AND FOOD SCIENCES

B.R. Carruth, Professor and Head of
 Department
 R.E. Beauchene, Professor
 G.W. Disney, Assistant Professor
 W.L. Dodson, Graduate Research
 Assistant
 G.A. Gaskin, Graduate Research
 Assistant
 G. Loo, Graduate Research Assistant
 N.L. Marable, Associate Professor
 M.P. Penfield, Professor

T.H. Rhew, Graduate Research
 Assistant
 R.A. Ruark, Graduate Research
 Assistant
 D.S. Sachan, Associate Professor
 J.D. Skinner, Assistant Professor
 J.T. Smith, Professor
 P.K. Su, Graduate Research Assistant
 G.C. Viglietti, Graduate Research
 Assistant
 J.E. Wright, Graduate Research
 Assistant

ORNAMENTAL HORTICULTURE AND LANDSCAPE DESIGN

G. Douglas Crater, Professor and Head
 L.M. Callahan, Professor
 Angela D. Cockrel, Graduate Research
 Assistant
 John W. Day, Associate Professor
 Effin T. Graham, Associate Professor
 Lori D. Lester, Graduate Research
 Assistant
 Gary L. McDaniel, Associate Professor

Ellen R. McDonald, Graduate
 Assistant
 Jennifer L. Sanders, Graduate
 Research Assistant
 Nadine A. Turner, Graduate Research
 Assistant
 Hendrik van de Werken, Professor
 Willard T. Witte, Associate Professor
 Donald B. Williams, Professor

PATHOBIOLOGY

Robert L. Michel, Professor and Head
Leon N.D. Potgieter, Professor

Robert D. Walker, Assistant Professor

PLANT AND SOIL SCIENCE

L.F. Seatz, Professor and Head of
Department
F.L. Allen, Associate Professor
N.H. Al-Mohammadi, Graduate
Research Assistant
J.R. Attewell, Graduate Research
Assistant
E.L. Bradley, Graduate Research
Assistant
D.L. Coffey, Professor
B.V. Conger, Professor
D.E. Deyton, Assistant Professor
B.H. Duck, Professor, Martin
P.B. Francis, Graduate Research
Assistant
H.A. Fribourg, Professor
J.P. Gavin, III, Senior Research
Assistant
C.R. Graves, Professor
D.A. Graves, Graduate Research
Assistant
G.E. Hanning, Graduate Research
Assistant
B.R. Hathcock, Associate Professor,
Martin
R.M. Hayes, Associate Professor,
Jackson
P.E. Hoskinson, Associate Professor,
Jackson
D.D. Howard, Associate Professor,
Jackson
L.S. Jeffery, Professor
D.W. Jones, Graduate Research
Assistant
P.A. Joshi, Graduate Research
Assistant
H.C. Kincer, Assistant Professor
M.A. Krstich, Graduate Research
Assistant

W.A. Krueger, Associate Professor
G.M. Lessman, Associate Professor
R.J. Lewis, Associate Professor
D.A. Lietzke, Associate Professor
L.L. Marden, Graduate Research
Assistant
R.D. Miller, Assistant Professor,
Greeneville
C.N. Milne, Graduate Research
Assistant
R.L. Mitchell, Graduate Research
Assistant
C.A. Mullins, Associate Professor,
Crossville
G.K. Palmer, Graduate Research
Assistant
W.L. Parks, Professor
P.D. Petracek, Graduate Research
Assistant
S.L. Pyle, Graduate Research Assistant
P.W. Ramsey, Graduate Research
Assistant
V.H. Reich, Associate Professor
J.H. Reynolds, Professor
C.E. Sams, Assistant Professor
P.P. Shelby, Graduate Research
Assistant
D.D. Songstad, Graduate Research
Assistant
D.D. Tyler, Associate Professor,
Jackson
J.L. Vest, Graduate Research Assistant
S.H. Wang, Graduate Research
Assistant
B.A. Wendel, Graduate Research
Assistant
D.R. West, Assistant Professor
J.D. Wolt, Assistant Professor

RURAL PRACTICE

Horace T. Barron, Professor and Head

Fred M. Hopkins, Associate Professor

TEXTILES, MERCHANDISING AND DESIGN

Jacquelyn O. DeJonge, Professor and
Head of Department
F. Duncan Case, Associate Professor

Larry C. Wadsworth, Associate
Professor
Karen K. Leonas, Graduate Research
Assistant
Pi-Shin Wey, Graduate Research
Assistant

PERSONNEL CHANGES

Appointments

N.H. Al-Mohammadi, Graduate
Research Assistant in Plant and Soil
Science, January 1, 1983

Hussain M. Bakir, Graduate Research
Assistant in Forestry, Wildlife and
Fisheries, July 1, 1983

Kevin D. Banker, Graduate Research
Assistant in Agricultural Economics,
March 21, 1983

B.R. Bell, Assistant Professor in
Animal Science, January 17, 1983

Rebecca A. Benda, Graduate Research
Assistant in Forestry, Wildlife, and
Fisheries, September 15, 1983
(reappointment)

Louis Caldwell, Graduate Research
Assistant in Animal Science,
September 12, 1983

Janice R. Carmichael, Graduate
Research Assistant in Forestry,
Wildlife, and Fisheries, June 15,
1983

Robert Cato, Graduate Research Assis-
tant in Animal Science, September
6, 1983

Russell Coleman, Graduate Research
Assistant in Entomology & Plant
Pathology, January 1, 1983

W.L. Dodson, Graduate Research
Assistant in Nutrition and Food
Sciences, October 1, 1983

Jeffrey P. Durniak, Graduate Research
Assistant in Forestry, Wildlife, and
Fisheries, April 4, 1983

B.H. Erickson, Professor in Animal
Science, August 1, 1983

Celia B. Ferguson, Graduate Research
Assistant in Child and Family
Studies, September 1, 1983

G.A. Gaskin, Graduate Research Assis-
tant in Nutrition and Food
Sciences, January 5, 1983

Paula Gaynor, Graduate Research
Assistant in Animal Science,
September 6, 1983

Thomas E. Glasgow, Graduate
Research Assistant in Agricultural
Economics, January 3, 1983

Jack Glisson, Graduate Research Assis-
tant in Animal Science, September
6, 1983

J.D. Godkin, Assistant Professor in
Animal Science, June 1, 1983

Kimberly Goode, Graduate Research
Assistant in Entomology & Plant
Pathology, January 1, 1983

D.A. Graves, Graduate Research Assis-
tant in Plant and Soil Science,
August 23, 1983

W.E. Hart, Instructor in Agricultural
Engineering, July 1, 1983

L.O. Hillon, Research Assistant in
Agricultural Engineering, March 1,
1983.

G.C. Hodge, Graduate Research Assis-
tant in Agricultural Engineering,
April 1, 1983.

Cassandra L. Hohanshelt, Graduate
Research Assistant in Forestry,
Wildlife, and Fisheries, September
15, 1983

C.D. Holden, Graduate Research
Assistant, Food Technology and
Science, March 15, 1983

Mark L. Hughes, Graduate Research
Assistant in Forestry, Wildlife, and
Fisheries, June 1, 1983

Jacqueline Johnson, Graduate Research
Assistant in Animal Science,
September 12, 1983

D.W. Jones, Graduate Research Assis-
tant in Plant and Soil Science, Oc-
tober 1, 1983

- David Keltner, Graduate Research Assistant in Animal Science, September 6, 1983
- T.E. Kirkemide, Graduate Research Assistant in Agricultural Engineering, January 1, 1983.
- K.A. Kneisley, Graduate Research Assistant in Agricultural Engineering, July 11, 1983
- T.L. Knox, Graduate Research Assistant, Food Technology and Science, January 1, 1983
- David M. Kocka, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, July 1, 1983
- P.K. Lee, Graduate Research Assistant, Food Technology and Science, March 15, 1983
- H.D. Loveday, Associate Professor, Food Technology and Science, August 1, 1983
- S.P. Manos, Graduate Research Assistant in Agricultural Engineering, September 1, 1983
- J.E. Maples, Research Assistant in Agricultural Engineering, June 1, 1983
- L.L. Marden, Graduate Research Assistant in Plant and Soil Science, January 1, 1983
- William D. McBride, Graduate Research Assistant in Agricultural Economics, January 3, 1983
- Cary D. McDonald, Research Associate in Forestry, Wildlife, and Fisheries, December 5, 1983
- Kathlyne A. McGee, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, January 1, 1983
- Henry G. Mealing, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, July 1, 1983
- Charles E. Meier, Graduate Research Assistant in Agricultural Economics, September 21, 1983
- C.N. Milne, Graduate Research Assistant in Plant and Soil Science, January 1, 1983
- S.E. Monteith, Graduate Research Assistant in Plant and Soil Science, September 19, 1983
- Russell D. Morgan, Graduate Research Assistant in Agricultural Economics, March 24, 1983
- C.R. Mote, Associate Professor in Agricultural Engineering, May 1, 1983
- Francis Mueller, Graduate Research Assistant in Animal Science, September 19, 1983.
- P.D. Petracek, Graduate Research Assistant in Plant and Soil Science, September 19, 1983
- T.G. Prather, Extension Assistant in Agricultural Engineering, April 25, 1983
- Margaret Ragan, Graduate Research Assistant in Entomology & Plant Pathology, March 1, 1983
- G.N. Reynolds, Graduate Research Assistant, Food Technology and Science, September 15, 1983
- W.T. Roberts, Graduate Research Assistant, Food Technology and Science, December 1, 1983
- C.E. Sams, Assistant Professor in Plant and Soil Science, October 1, 1983
- D.A. Schoenrock, Graduate Research Assistant, Food Technology and Science, March 15, 1983
- Thomas Short, Graduate Research Assistant in Animal Science, September 20, 1983
- D.D. Songstad, Graduate Research Assistant in Plant and Soil Science, September 12, 1983
- B.A. Wendel, Graduate Research Assistant in Plant and Soil Science, September 16, 1983
- J.B. Wilkerson, Instructor in Agricultural Engineering, April 1, 1983
- Robert P. Williams, Graduate Research Assistant in Agricultural Economics, September 15, 1983
- A.R. Womac, Graduate Research Assistant in Agricultural Engineering, October 1, 1983

J.E. Wright, Graduate Research Assistant in Nutrition and Food Sciences, March 23, 1983

Timothy M. Young, Research Associate in Forestry, Wildlife, and Fisheries, September 1, 1983

Terminations

R.B. Arnold, Graduate Research Assistant in Nutrition and Food Sciences, May 31, 1983

S.C. Gettys, Graduate Research Assistant, Food Technology and Science, August 31, 1983

V.H. Ayers, Graduate Research Assistant in Agricultural Engineering, June 10, 1983

Ginger Gist, Graduate Research Assistant in Entomology and Plant Pathology, August 31, 1983

Sonya M. Baird, Graduate Research Assistant in Entomology and Plant Pathology, December 9, 1983

Elizabeth S. Groton, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 15, 1983

S. Banet, Graduate Research Assistant in Animal Science, August 31, 1983

James P. Groton, Jr., Graduate Research Assistant in Forestry, Wildlife, and Fisheries, May 30, 1983

D.J. Barber, Graduate Research Assistant in Agricultural Engineering, November 30, 1983

Mark J. Gudlin, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, July 31, 1983

M.B. Bauman, Graduate Research Assistant in Plant and Soil Science, April 15, 1983

C.B. Guy, Graduate Research Assistant in Plant and Soil Science, May 31, 1983

E.E. Beaver, Graduate Research Assistant in Animal Science, August 24, 1983

Bruce C. Hastings, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, March 31, 1983

Michael B. Bishop, Graduate Research Assistant in Agricultural Economics, May 31, 1983

Joan Hembree, Graduate Research Assistant in Animal Science, August 31, 1983

Paul B. Brown, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 31, 1983

G.C. Hodge, Graduate Research Assistant in Agricultural Engineering, September 20, 1983

W.L. Bryson, Graduate Research Assistant in Animal Science, August 12, 1983

J.W. Holloway, Associate Professor in Animal Science, August 9, 1983

J.N. Burch, Graduate Research Assistant in Plant and Soil Science, December 31, 1983

Mark M. Jamnick, Research Associate in Forestry, Wildlife, and Fisheries, July 31, 1983

Donald A. Cunningham, Research Associate in Agricultural Economics, September 16, 1983

Susan F. Jamnick, Graduate Research Assistant in Agricultural Economics, July 30, 1983

Karen L. Daniel, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, December 31, 1983

Kenneth G. Johnson, Research Associate in Forestry, Wildlife, and Fisheries, June 30, 1983

J.R. Ford, Graduate Research Assistant in Animal Science, December 31, 1983

D.W. Jones, Graduate Research Assistant in Agricultural Engineering, October 1, 1983

J.M. Fernandez, Graduate Research Assistant in Animal Science, August 5, 1983

Brien E. Keyes, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 15, 1983

Victor Fulgoni, Graduate Research Assistant in Animal Science, August 31, 1983

- T.E. Kirkemide, Graduate Research Assistant in Agricultural Engineering, March 31, 1983
- K.A. Kneisley, Graduate Research Assistant in Agricultural Engineering, December 31, 1983
- C.E. Kounanis, Graduate Research Assistant in Plant and Soil Science, March 31, 1983
- P.J. Linnen, Graduate Research Assistant in Plant and Soil Science, October 31, 1983
- Elizabeth Long, Graduate Research Assistant in Entomology and Plant Pathology, December 9, 1983
- K. Madeira, Graduate Research Assistant in Nutrition and Food Sciences, December 31, 1983
- Elaine Mahoney, Graduate Research Assistant in Animal Science, December 31, 1983
- T.L. Mann, Graduate Research Assistant, Food Technology and Science, June 30, 1983
- Candace Martino, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, March 31, 1983
- R.E. McDonnell, Graduate Research Assistant in Plant and Soil Science, June 24, 1983
- J.C. McNeal, Graduate Research Assistant in Agricultural Engineering, March 31, 1983
- R.J. Miles, Assistant Professor in Plant and Soil Science, July 22, 1983
- Nancy Mitchell, Graduate Research Assistant in Animal Science, August 24, 1983
- D.C. Mobley, Graduate Research Assistant, Food Technology and Science, August 31, 1983
- Peter G. Moditz, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, May 31, 1983
- S.E. Monteith, Graduate Research Assistant in Plant and Soil Science, December 31, 1983
- Richard D. Morris, Graduate Research Assistant in Agricultural Economics, March 18, 1983
- Julie C. Neri, Graduate Research Assistant in Entomology and Plant Pathology, March 15, 1983
- Ben G. Nottingham, Jr., Graduate Research Assistant in Forestry, Wildlife, and Fisheries, October 19, 1983
- Terry Parrott, Graduate Research Assistant in Animal Science, August 31, 1983
- K.M. Perry, Graduate Research Assistant in Plant and Soil Science, July 20, 1983
- J.N. Reed, Graduate Research Assistant in Plant and Soil Science, August 23, 1983
- D.K. Rosen, Graduate Research Assistant in Agricultural Engineering, June 15, 1983
- David G. Sawyer, Graduate Research Assistant in Agricultural Economics, July 8, 1983
- B.D. Sims, Graduate Research Assistant in Plant and Soil Science, May 20, 1983
- C.D. Smothers, Graduate Research Assistant in Animal Science, July 18, 1983
- Mary E. Stivers, Graduate Research Assistant in Child and Family Studies, August 31, 1983
- Nadine A. Turner, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, June 15, 1983
- Thomas A. Waldrop, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, December 31, 1983
- L.K. Warlick, Graduate Research Assistant in Plant and Soil Science, May 31, 1983
- William G. Wathen, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 6, 1983
- David Watkins, Graduate Research Assistant in Animal Science, December 31, 1983
- George B. Wilson, Graduate Research Assistant in Entomology and Plant Pathology, March 15, 1983

Deceased

- E.W. Swanson, Professor in Animal Science, February 12, 1983
 Webster Pendergrass, Vice President for Agriculture Emeritus, April 1, 1983
 Tom McCutchen, Superintendent, Milan Experiment Station, June 3, 1983

Change of Titles

- E.W. Culvahouse, Jr. to Professor in Animal Science, July 1, 1983
 P.M. Davidson, to Associate Professor in Food Technology and Science, July 1, 1983
 F.A. Draughon, to Associate Professor in Food Technology and Science, July 1, 1983
 R.R. Gerhardt, to Professor in Entomology and Plant Pathology, July 1, 1983
 S.L. Melton, to Professor in Food Technology and Science, July 1, 1983
 J.K. Miller, to Professor in Animal Science, July 1, 1983
 S.D. Mundy, to Professor in Agricultural Economics, July 1, 1983
 M.P. Penfield, to Professor in Nutrition and Food Sciences, July 1, 1983
 C.M. Sasser, to Research Associate in Agricultural Economics, April 13, 1983
 D.D. Tyler, to Associate Professor of Plant and Soil Science, July 1, 1983
 J.B. Wilkerson, from Graduate Research Assistant to Instructor in Agricultural Engineering, April 1, 1983
 James L. Wilson, to Professor in Forestry, Wildlife, and Fisheries, July 1, 1983

Retirements

- H.N. Carringer, Creamery Manager, Food Technology and Science, December 31, 1983
 J.R. Overton, Associate Professor of Plant and Soil Science, Jackson, June 29, 1983

Transfer

- C.C. Melton, from Professor Agricultural Experiment Station to Professor Agricultural Extension Service, University of Tennessee, January 1, 1983
 Robert M. Wheat, from Graduate Research Assistant in Forestry, Wildlife, and Fisheries, to Graduate Assistant in Forestry, Wildlife, and Fisheries, September 16, 1983
 Priscilla N. White, Professor and Head, Child and Family Studies, to Professor, Child and Family Studies, College of Home Economics, July 31, 1983