



1986

Annual Report of the Tennessee Agricultural Experiment Station, 1986

University of Tennessee Agricultural Experiment Station

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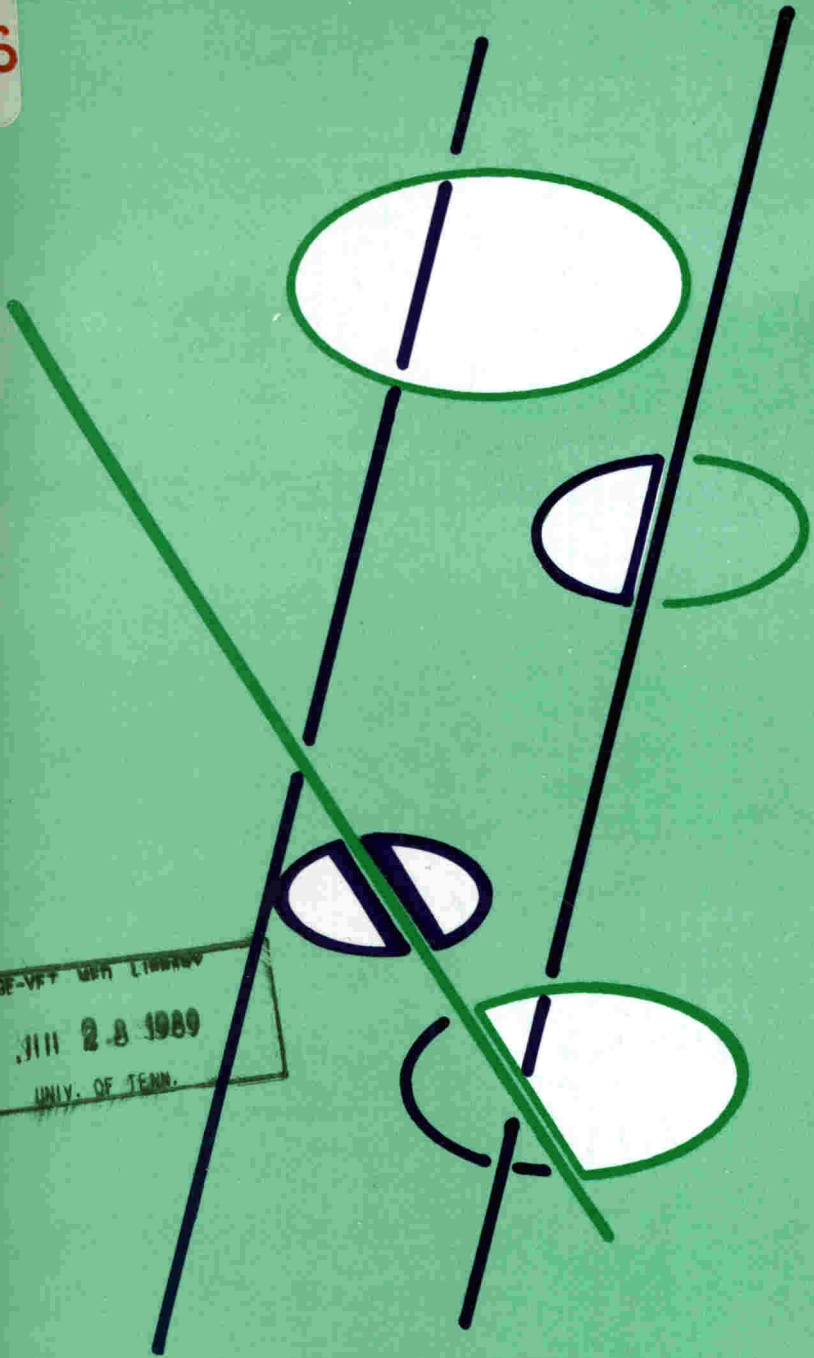
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Annual Report of the
*Tennessee Agricultural
Experiment Station 1986*

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The University of Tennessee
Knoxville

**Ninety-Ninth
Annual Report
1986**

**University of Tennessee
Agricultural Experiment Station**

Edward J. BolingPresident of the University
W.W. ArmisteadVice President for Agriculture
D.M. GossettDean
J.I. SewellAssociate Dean
T.H. KlindtAssistant Dean

**The University of Tennessee
Knoxville**

E11-0415-00-014-88

LETTER OF TRANSMITTAL

Knoxville, Tennessee

January 2, 1987

To His Excellency, Ned McWherter
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 1986.

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

Respectfully submitted,
Edward J. Boling, President

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Ninety-Ninth Annual Report of the Tennessee Agricultural Experiment Station 1986

FOREWORD

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

- 1) Research projects active as of December 31, 1986;
- 2) Research projects terminated during the calendar year, 1986.
- 3) Bulletins, articles, and reports prepared by Experiment Station staff members and published during the calendar year 1986.

In addition, the report contains the financial statement for the Agricultural Experiment Station covering the period July 1, 1986 to June 30, 1986. Also included is a list of the Experiment Station personnel for the calendar year 1986.

Active Projects

As of December 31, 1986, there were 170 Hatch (TN) projects and six 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 nine 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 in this report, and their locations are shown on the map on page 5.

Projects Terminated

During 1986, 29 projects were terminated. Reports on these projects have either been published or are being prepared for publication.

Publications

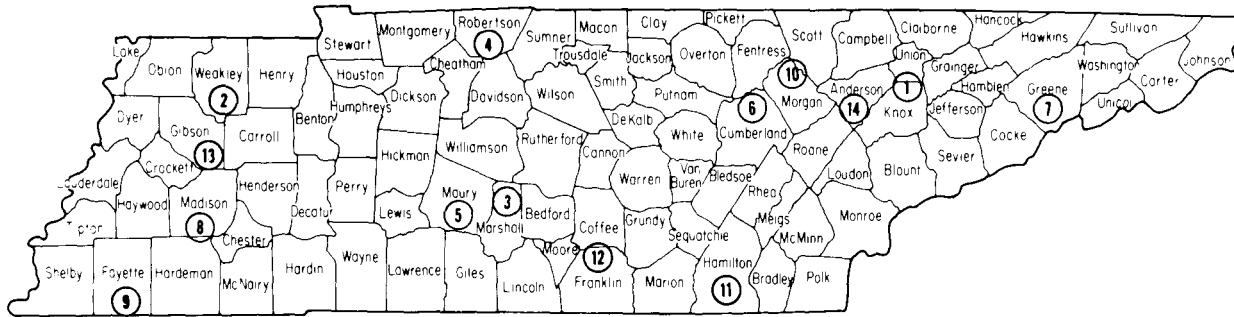
Published reports on research of the University of Tennessee Agricultural Experiment Station appear in the Station Bulletins, in Research Reports, in *Tennessee Farm and Home Science*, in professional, technical periodicals and various popular publications. Seven Station Bulletins and 22 Research Reports were published during the year. These publications and other technical, semi-technical, and special reports prepared and published during 1986 are listed in this annual report.

FINANCIAL STATEMENT
July 1, 1985 - June 30, 1986
The University of Tennessee Agricultural Experiment Station

	<u>HATCH</u>	<u>Reg. Resource</u>	<u>McIntire Stennis</u>	<u>Animal Health & Disease</u>	<u>Federal Grants</u>	<u>Other Funds</u>	<u>Total</u>
Balance 6-30-85						\$ 1,005,783	\$ 1,005,783
Revenues	\$3,287,084	\$736,450	\$258,359	\$65,409	\$460,577	14,270,831	19,078,710
Funds Available	\$3,287,084	\$736,450	\$258,359	\$65,409	\$460,577	\$15,276,614	\$20,084,493
Expenditures:							
Personal Services	\$3,240,411	\$714,672	\$256,360	\$32,656	\$238,442	\$ 6,238,227	\$10,720,768
Staff Benefits					32,654	2,542,674	2,575,328
Travel	20,602	8,876	136	636	22,624	283,965	336,839
Equipment	9,936	7,957		16,678	37,900	803,081	875,552
Land & Structures						205,304	205,304
Other Operating	16,135	4,945	1,863	15,439	128,957	4,188,288	4,355,627
Total Expenditures	\$3,287,084	\$736,450	\$258,359	\$65,409	\$460,577	\$14,261,539	\$16,069,418
Balance 6-30-86*						\$ 1,015,075	\$ 1,015,075

*Includes Encumbered Obligations

The University of Tennessee Agricultural Experiment Station



- 1 Knoxville Experiment Station
- 2 Martin Experiment Station

Station Locations

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

*Forestry Experiment Station

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 648	The Impact of Changing Costs, Institutions, and Technology on the Southern Dairy Industry (contributing to Regional Project S-166)
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	Regional Advantages in Producing and Marketing Woody Ornamentals (contributing to Regional Project S-103)
TN 683	The Economics of Improving Productivity in Livestock-Meat Systems in the South (contributing to Regional Project S-172)
TN 685	Marketing Systems for Grains and Soybeans (contributing to Regional Project S-176)
TN 694	Structural and Operational Efficiency of the Fruit and Vegetable Production-Marketing System (contributing to Regional Project S-178)
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	Disturbances to Price Discovery—Risk Management by Marketing Firm in Southern Agriculture (contributing to Regional Project S-190)
TN 736	Barriers and Incentives to Affordable Housing (contributing to Regional Project S-194)
TN 739	Factors Affecting Metropolitan and Nonmetropolitan Bank Performances in Tennessee
TN 751	Retail Demand for Tennessee Fresh Fruits and Vegetables
TN 769	Tennessee Agriculture's Response to Alternative Socioeconomic Environments
TN 783	Economics of the Production of Tobacco and Alternative Enterprises in Tennessee
TN 790	Demographic Trends of the Tennessee Rural and Farm Population
TN 796	Economic Problems of Beginning Farmers
TN 814	Analysis of Economic Impacts: GM's Saturn Plant Location in Rural Tennessee
TN 825	Economic Analysis of Machinery Inputs on Tennessee Farms

- TN 826 Potential for Limiting Liability Associated with the Use of Agricultural Chemicals
- TN 837 The Potential for Community Economic Development and its Impact on Rural Residents (contributing to Regional Project NE-162)
- TN 839 Analysis of Structural and Organizational Change in Rural Counties in the South (contributing to Regional Project S-209)

Projects Concluded in 1986

- TN 626 Alternative Systems of Swine Production
- TN 633 An Economic Analysis of Alternative Marketing Strategies for Cotton Producers (contributing to Regional Project S-153)
- TN 641 Utilization and Control of Land In and Around Rural Communities in Tennessee
- TN 651 Improving Community Services in Nonmetropolitan Counties in the South (contributing to Regional Project S-158)
- TN 691 Farm Business Performance
- TN 743 The Effects of Changing Cropping Patterns on Agricultural and Rural Incomes in Tennessee

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

- Brooker, John R., David B. Eastwood, and Danny E. Terry. Predicting Food Prices from Estimated Implicit Values of Nutritional Characteristics, Research Report 86-01.
- Church, Alma Faye, Deborah M. Markley, and William M. Park. Comparative Cost Analysis of Alternative Solid Waste Collection Systems in Rural Tennessee Counties, Research Report 86-20.
- Cleland, Charles L. 1986. Trends in the Population of Tennessee Nonmetropolitan and Metropolitan Counties, 1960-1980. Tenn. Agri. Exp. Sta. Res. Report 86-03.
- Cunningham, Donald A., and B. R. McManus. Preservation of Prime Farmland and Planned Rural Development: A Literature Review, Research Report No. 86-11, June.
- Eastwood, David B., Morgan D. Gray, and John R. Brooker. Socioeconomic Factors Affecting the Marginal Implicit Prices of Food Nutrients, Bull. No. 649, October.
- Eastwood, David B., Robert H. Orr, and John R. Brooker. Consumer Stated Preferences for Fresh Fruits and Vegetables, Research Report 86-06.
- Leuthold, Frank O. Tennessee County Government: Services and Taxes, Research Report 86-08, April.
- McLemore, Dan L., and Joey M. Gross. Econometric and Futures Market Models for Forecasting Tennessee Feeder Cattle Prices, Research Report 86-22.
- McLemore, Dan L., Emily A. McClain, and Glen D. Whipple. Relationship Between Cattle Prices and Sales Volumes on Tennessee Auction Markets, Research Report 86-07, April.
- Mundy, S. Darrell, and Morgan D. Gray. Types of Farming in Tennessee, Bull. No. 646.

- Orr, Robert H., M. Lisa Llewellyn, and Irving Dubov. Access to Health Care in Rural East Tennessee, Bull. No. 644.
- Park, William M., and Kevin W. Ferguson. Soil Erosion Control in the North Fork of the Forked Deer Watershed in West Tennessee, Bull. No. 648.
- Todd, Ronald W. Decedents' Estates—Selected Guidelines for Administering Estates in Tennessee, Bull. No. 647.

Tennessee Farm and Home Science Articles

- Badenhop, M. B., and John W. Day. "Costs of Field Grown Deciduous Shrubs (Forsythia) Differentiated by Size of Firm," No. 137, Winter, pp. 3-7.
- Badenhop, M. B., and John W. Day. "Costs of Field-Grown Narrowleaf Evergreen Shrubs (Andorra juniper) Differentiated by Size of Firm," No. 137, Winter, pp. 8-12.
- Badenhop, M. B., and John W. Day. "Costs of Field-Grown Broadleaf Evergreens ('Manhattan' euonymus) Differentiated by Size of Firm." No. 138, Spring, pp. 8-13.
- Dubov, Irving. "Export Markets and Agriculture," No. 139, Summer.
- Hart, Cynthia G., and Frank O. Leuthold. "Land Tenure and No-Tillage Use by West Tennessee Famers," No. 139, Summer, pp. 10-13.
- Lessman, Gary M., and Luther H. Keller. "Comparison of Soil Test Recommendations on Soybean Fields," No. 139, Summer.

Journal Articles

- Brooker, John R., Danny E. Terry, and David B. Eastwood. "Hedonic Pricing of Food Items Based on Nutritive Attributes," Journal of Food Distribution Research, Vol. XVII, No. 1, Proceedings Issue, Food Distribution Research Society, Inc., February.
- Eastwood, David B., John R. Brooker, and Danny E. Terry. "Household Nutrient Demand: Use of Characteristics Theory and a Common Attribute Model," Southern Journal of Agricultural Economics, Vol. 2, No. 2, December.
- Eastwood, David B., Sammie G. Garner. "Home Repairs: A Household Production Perspective," Journal of Behavioral Economics, Vol. 15, Summer.
- Eastwood, David B., Robert H. Orr, and John R. Brooker. "Consumer Preference for Locally Produced Fruits and Vegetables," Journal of Food Distribution Research, Vol. XVII, No. 1:81, February.
- English, Burton C., and David R. Krog. "Terracing Economics on Iowa Soils," Journal of Soil and Water Conservation, Vol. 7, No. 2, July, pp. 51-64.
- Garrod, Peter V., and Roland K. Roberts. "Prices as Proxies for Prices," American Journal of Agricultural Economics, Vol. 68, No. 3, August, pp. 626-633.
- Roberts, Roland K. "Plant Nutrient Demand Functions for Tennessee with Prices of Jointly Applied Nutrients," Southern Journal of Agricultural Economics, Vol. 18, No. 2, December.
- Sposito, Vince A., and Burton C. English. "Reliability of Linear Programming Software: An Experience with the IBM Mathematical Programming System Series: Comments," Journal of Agricultural Economics, Vol. 68, No. 2, May, pp. 370-372.

M. S. Theses

- Bohannon, Julie Ann Welch. "Entry Methods for Tennessee Beginning Dairy Farmers: A Case Study Approach," under B. R. McManus, December.
- Church, Alma Faye. "A Comparative Cost Analysis of Alternative Solid Waste Collection Systems in Rural Tennessee," under Deborah M. Markley, August.
- Davis, Carleton. "An Economic Evaluation of Alternative Marketing Strategies for Tennessee Cotton Producers," under John R. Brooker, December.
- Ferguson, Kevin W. "An Economic Analysis of the Effects of Feeder Calf Characteristics on Important Feedlot and Carcass Characteristics," under Dan L. McLemore, December.
- Gockowski, James J. "Catfish and Trout Aquaculture in Tennessee—An Economics Analysis," under Luther H. Keller, August.
- McBride, William D. "Minimum Capital Requirements to Achieve Selected Net Farm Income Levels from Alternative Systems of Farrow-to-Finish Swine Production Systems on Tennessee Farms," under S. Darrell Mundy, August.
- Menard, Robert J. "An Analysis of Factors and Policies Relating to Use of Highly Erodible Land in West Tennessee for Crop Production," under William M. Park.
- Monteith, Steven E. "Comparison of Variable and Uniform Rate Cost Sharing for Conservation Practices in West Tennessee," under William M. Park.
- Morgan, Russell. "An Economic Comparison of Alternative Waste Management Systems on Dairy Farms in Tennessee," under Luther H. Keller, December.

Ph.D. Dissertations

- Nagu, Joseph Tarmo. "The Development of Smallholder Tea Production in Tanzania: An Economic Analysis of Factors Influencing Green Leaf Tea Output," under S. Darrell Mundy.

Other Writings

Bulletins/Publications

- Dubov, Irving. "Agriculture Sector—1987", An Economic Report to the Governor of the State of Tennessee, Tennessee State Planning Office, Nashville, Tennessee, November.
- Ervin, David E., Burton D. English and Stan R. Johnson. The Conservation Reserve: A Preliminary Assessment of the Short-Run Impacts, Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa, 86-SR5.
- Isaacs, Steve G., S. Darrell Mundy, and Donald J. Fowlkes. The Carousel System for Striping and Grading Burley Tobacco, SP 337, Agric. Ext. Service.
- Kindt, Thomas H., Mary P. Richards, and C. Glennon Rowell. "The Master's Degree at UTK," Teaching-Learning Issues, Learning Research Center, University of Tennessee, Knoxville, Tennessee, Spring.
- Markley, Deborah M., and William M. Park. "Can Rural Recycling Centers Work? Evidence from Tennessee," Rural Development Perspectives, Vol. 3, No. 1, October, pp. 25-28.
- Mayo, John W., and Irving Dubov. "U.S. Outlook: Economy on the Move, But Which Way?" Survey of Business—UTK CBER, Vol. 21, No. 2, Winter, pp. 18-23.

- Park, William M., Luther H. Keller, Robert J. Menard, and Steven E. Monteith. *Strategies for Conversion of Highly Eroding Cropland in West Tennessee*, Tennessee Water Resources Research Center, University of Tennessee, Knoxville, Tennessee, Research Report No. 112, September.
- Roberts, Roland K., John S. Sisson and Frank S. Scott, Jr. *The Effects of Changing Imports and Tariffs on the Hawaii Papaya Industry*, University of Hawaii, Hawaii Institute of Tropical Agriculture and Human Resources, Research Series No. 46.
- Rosenberry, Paul, and Burton C. English. "Erosion Control Practices: The Impact of Actual Versus the Most Effective Use," in *Soil Conservation Assessing the National Resource Inventory*, Washington, D.C., National Academy Press.
- VanTassell, Larry W., and J. Richard Conner. *An Economic Analysis of Brush Control Practices and Grazing Systems in the Rolling Plains of Texas*, Texas Agricultural Experiment Station No. MP-1619.
- VanTassell, Larry W., and J. Richard Conner. "Investment Analysis of Grazing Systems and Brush Control in the Rolling Plains of Texas," in *Grazing Research in Texas, 1980-85*. Texas Agricultural Experiment Station, CPR-4456, pp. 58-59.
- VanTassell, Larry W., and Clair J. Nixon. *Machinery Replacement Options in the Changing Tax Environment*, Texas Agricultural Experiment Station, Department of Agricultural Economics, DIR No. 86-2.
- VanTassell, Larry W., Rod K. Heitschmidt, and J. Richard Conner. "Calf Performance Models for the Texas Rolling Plains," in *Grazing Research in Texas, 1980-85*, Texas Agricultural Experiment Station, CPR-4453, pp. 56-57.

Papers Presented and/or Proposed

- Brooker, John R. "Consumer Preferences for Tennessee Fruits and Vegetables," presented at Third Annual Tennessee Fruit and Vegetable Growers Conference, Nashville, Tennessee, February.
- Brooker, John R. "Urban Consumers' Attitudes Regarding Locally Produced Fruits and Vegetables," presented at the National Conference on Direct Marketing, Des Moines, Iowa, March.
- Brooker, John R. "Cooperatives in Tennessee," National Institute of Cooperative Education, August.
- Brooker, John R. "Consumers' Perceptions of Locally Grown Produce at Retail Outlets," presented at the National Conference of Food Distribution Research Society, Denver, Colorado, September.
- Brooker, John R., David Eastwood, and Robert Orr. "Research on Consumer Preferences for Vegetables and Fruits," presented at Annual Conference of the Tennessee Vegetable and Fruit Growers Association, Nashville, Tennessee, February.
- Brooker, John R., David Eastwood, and Robert Orr. "Consumers' Perceptions of Locally Grown Produce of Retail Outlets," presented at the 1986 Meetings of the Food Distribution Research Society, Denver, Colorado.
- Eastwood, David B. "Advertising: A Consumer Economics Perspective," presented at International Conference on Research in the Consumer's Interest, Racine, Wisc., August.

- Markley, Deborah M. "Impacts of Banking Deregulation on Rural Capital Markets: Evidence from Virginia and Tennessee," paper presented at the Southern Regional Science Association Annual Meetings, New Orleans, Louisiana, March 6-8.
- Markley, Deborah M. "Microeconomic Impacts at the Rural Community Level: Deregulation of U.S. Financial Markets," paper presented in Organized Symposium on Macroeconomic Policy and its Microeconomic Implications for Agriculture and Rural Southern Communities, Southern Agricultural Economics Association Annual Meetings, Orlando, Florida, February 3.
- Markley, Deborah M., and William M. Park. "The Economic Feasibility of Rural Recycling: A Case Study," paper presented at the Southern Agricultural Economics Association Meetings, Orlando, Florida, February 2-5.
- Menard, Robert J., and William M. Park. "An Evaluation of Conservation Rental Contracts for Retiring Highly Eroding Cropland in West Tennessee," paper presented at the Soil Conservation Society of America Annual Meetings, Raleigh, North Carolina, August 3-6.
- Monteith, Steven E., and William M. Park. "A Comparison of Variable and Uniform Cost Sharing of ACP Conservation Practices in West Tennessee," poster paper presented at the Soil Conservation Society of America Annual Meetings, Raleigh, North Carolina, August 3-6.
- Orr, Robert H., and O. Neal Walker. "Farm Problem Identification and Goals for Government Action: An Analysis of Tennessee Farmers Opinions by Location and Farm Size," presented at the 1986 Meetings of the Southern Rural Sociological Association, Orlando, Florida.
- Park, William M. "Offsite Costs of Erosion," presentation at the Upper Duck River Water Quality Conference, Shelbyville, Tennessee.
- Park, William M., and Kevin W. Ferguson. "Factors Associated with Farmers' Expression of Need for Conservation Practices," paper presented at the American Agricultural Economics Association Meetings, Reno, Nevada, July 27-30.
- Roberts, Roland K. "Plant Nutrient Demand Functions for Tennessee with Prices of Jointly Applied Nutrients," presented at meeting of the Southern Agricultural Economics Association, Orlando, Florida, February.
- VanTassell, Larry W., J. Richard Conner, and Rod K. Heitschmidt. "Modeling Calf Production in the Texas Rolling Plains," paper presented at the Southern Agricultural Economics Association Annual Meeting, Orlando, Florida, February.

Reports/Proceedings

- Eastwood, David B., Donald R. Ploch, and Greer Litton Fox. "Consumer Surveys: Two Suggested Procedures," Proceedings of the 32nd Annual Conference of the American Council on Consumer Interests, p. 322.
- Park, William M. "A Role for Incentives in Siting Landfills?," in Economic Issues in Waste Management, William M. Park and Lynn L. Reinschmiedt, Editors, Proceedings of a Regional Workshop, Muscle Shoals, Alabama, October 24, 1985, SNREC Publication No. 22, pp. 71-80.
- Park, William M., and E. B. Dyer, "Off-Site Damages from Soil Erosion in West Tennessee," in The Off-Site Costs of Soil Erosion, Thomas E. Waddell, Editor, Proceedings of a Symposium held in May, 1985, pp. 113-125.

Park, William M., Luther H. Keller, Robert J. Menard, and Steven E. Monteith. Strategies for Conversion of Highly Eroding Cropland in West Tennessee, Research Project Technical Completion Report No. 112, Tennessee Water Resources Research Center, University of Tennessee, Knoxville.

AGRICULTURAL ENGINEERING

<i>Proj. No.</i>	<i>Research Project Title</i>
TN 680	Effects, Mechanisms, and Control of Erosion and Sediment from Agricultural and Forest Land (contributing to Regional Project S-174)
TN 709	On-Site Wastewater Renovation
TN 740	Catalysts for Environmental Quality Control in Animal Confinement Facilities
TN 741	Labor Reduction in Harvesting, Handling, and Curing Air Cured Tobacco
TN 748	A Synergistic Energy System for Farm Structures Using an Earth Tube Coupled with a Heat Pump
TN 753	Engineering and Management Systems for Cotton Production, Harvesting, and Processing (contributing to Regional Project S-195)
TN 755	Processing and Storage of Southern Agricultural Commodities (contributing to Regional Project S-196)
TN 759	Mechanized Production of Selected Vegetable Crops in Tennessee
TN 765	Utilization of Animal Waste as Energy and Nutrient Sources in Warm, Humid Climates (contributing to Regional Project S-202)
TN 766	Optimize Production Efficiency of Animal Housing Systems in the Southern Region (contributing to Regional Project S-197)
TN 786	Drying Grain Sorghum and Minor Crops in Tennessee
TN 816	Application of Artificial Intelligence to Agricultural Research and Production
TN 827	Undertree (non-ice encapsulation) Frost Protection
TN 838	Automatic Control of Field Machinery Functions (contributing to Regional Project S-210)

Bulletins, Articles, and Reports—1986

Baxter, D. O. Performance Characteristics of an Earth-Tube Heat Exchanger in the Heating Mode. ASAE Paper No. 86-4003. American Society of Agricultural Engineers Summer Meeting, San Luis Obispo, California. June.

Baxter, D. O. Cooling Mode Performance of an Earth-Tube Heat Exchanger. ASAE Paper No. 86-4550. American Society of Agricultural Engineers Winter Meeting, Chicago, Illinois. December.

Baxter, H. D., B. L. Bledsoe, M. J. Montgomery, and J. R. Owen. Comparison of Alfalfa-Orchardgrass Hay Stored in Large Round Bales and Conventional Rectangular Bales for Lactating Cows. *Journal of Dairy Science*. Vol. 69, pp. 1854-64.

- Bledsoe, B. L., S. L. Shoulders, and J. W. Hitch. Guidelines for Solar Drying of Large Round Hay Bales. Proceedings of the 6th Annual Solar, Biomass and Wind Energy Workshop, USDA, Atlanta, Georgia. February.
- Bledsoe, B. L. and J. W. Hitch. Drying Large Hay Bales with Solar Heated Air Delivered by Electrically Powered Fans. Proceedings of 33rd Annual Conference of National Food and Energy Council. Nashville, Tennessee. July.
- Emerton, B. L. Static Pile Composting of Dairy Waste Solids for Use as Animal Bedding. Master of Science Thesis, The University of Tennessee.
- Freeland, R. S., F. D. Tompkins, and J. B. Wilkerson. An Inexpensive FM Telemetry Link for Computer Communication. ASAE Paper No. 86-1587. American Society of Agricultural Engineers Winter Meeting, Chicago, Illinois. December.
- Montgomery, M. J., A. Tineo, B. L. Bledsoe, and H. D. Baxter. Effect of Moisture Content at Baling on Nutritive Value of Alfalfa Orchardgrass Hay in Conventional and Large Round Bales. Journal of Dairy Science. Vol. 69, pp. 1847-1853.
- Mote, C. R. A Parallel Distribution Controller for On-Site Wastewater Systems. Applied Engineering in Agriculture 2(2):120-122.
- Mote, C. R. and C. L. Griffis. On-Site Domestic Wastewater Renovation System Designs to Overcome Soil Limitations. Utilization, Treatment, and Disposal of Waste on Land. Soil Science Society of America, Inc., Madison, Wisconsin. pp. 129-138.
- Mucke, F. A. A Comparison of Parallel and Serial Distribution of Septic Effluent. Master of Science Thesis, The University of Tennessee.
- Tompkins, F. D., R. S. Freeland, J. B. Wilkerson, and W. E. Hart. Remote Monitoring of Tractor-mounted Data Acquisition System Using FM Telemetry. Proceedings of the 1986 Beltwide Cotton Production Research Conferences, Las Vegas, Nevada. January.
- von Bernuth, R. D. and K. H. Solomon. "Emitter Construction." Chapter 2.1 of Trickle Irrigation for Crop Production. pp. 27-52. Elsevier Science Publishers, The Netherlands.
- von Bernuth, R. D. Computer Modeling in Water Management. University of Tennessee Agricultural Experiment Station Research Report 86-14. October.
- Vories, E. D. and R. D. von Bernuth. Single Nozzle Sprinkler Performance in Wind. Transactions of the ASAE 29(5):1325-1330.
- Wilkerson, J. B., F. D. Tompkins, and W. E. Hart. Computer Interfacing of Pulse Mode Position Sensors. ASAE Paper No. 86-1621. American Society of Agricultural Engineers Winter Meeting, Chicago, Illinois. December.

ANIMAL SCIENCE

Proj. No.

Research Project Titles

- | | |
|--------|---|
| TN 529 | Flexibility in Beef Production from Forage in Tennessee |
| TN 627 | Genetic Variation in Nutrient Intake and Utilization of Grazing Beef Females as Related to Genotype x Environment Interaction |
| TN 639 | Breeding Methods for Beef Cattle in the Southern Region (contributing to Regional Project S-10) |

- TN 670 The Effect of Different Kinds of Pasture and Grain Feeding Periods of Beef Carcass Quantitative and Qualitative Traits and Palatability Characteristics (in cooperation with Food Technology and Science Department)
- TN 702 The Substitution of Calcium Chloride for Sodium Chloride in Cottage Cheese (in cooperation with Food Technology and Science Department)
- TN 704 Improvement of Production Efficiency in Straightbred Beef Herds Through Heifer Selection
- TN 707 Management and Productivity of Fugus-Free and Fungus-Infested Fescue Pastures
- TN 723 Genetic-Physiology Mechanisms Associated with Nutrient Utilization in Poultry (contributing to Regional Project S-133)
- TN 728 Predictive Criteria for Reproductive Capacity in the Beef Heifer
- TN 731 Nutrition and Management of Swine for Increased Reproductive Efficiency (contributing to Regional Project S-145)
- TN 732 Light Stress and Cardiovascular Abnormalities in Broilers
- TN 733 The Maintenance of Pregnancy in the Cow: Fetal-Maternal Interactions
- TN 754 Resistance to Mastitis in Dairy Cattle
- TN 756 Resistance to Bovine Mastitis During the Dry Period
- TN 760 Influence of Feeder Pig Body Type on Performance and Fat Disposition (in cooperation with Food Technology and Science Department)
- TN 761 Competitive Exclusion on Environmental Mastitis Pathogens by *Corynebacterium bovis*
- TN 763 Metabolic Effects of *Acremonium coenophialum* Infected Fescue Ingested by Ruminants
- TN 767 Selection of Beef Cattle for Optimum Use of Resources
- TN 773 Nutritional, Health, and Behavioral Management of Purchased Feeder Pigs
- TN 774 Genetic and Economic Aspects of Food Traits and Care in Dairy Cattle
- TN 800 Ontogeny of Corticosteroid Binding Globulin in Swine
- TN 802 Improving the Acceptability of Southeastern Feeder Calves
- TN 803 Effects of Dietary Protein, Dietary Mineral Acid-Base Balance, and Photoperiod on Growth and Development of Broiler Chickens
- TN 804 Hypothalamic and Ovarian Function in the Postpartum Cow
- TN 805 Excretion of Carnitin, Sulphobromophthalein and Cartisol in the Bull Ejaculate
- TN 806 Treatment of Retained Placenta with Proteolytic Enzymes and Uterokinetic Drugs

- TN 809 Social and Environmental Influence on Reproductive Performance in Swine
- TN 811 Postweaning Nutritional Management of Pigs During the Nursery Phase
- TN 818 Preshipment Management and Transportation Effects on Subsequent Feeder Pig Performance
- TN 819 Alternate Systems of Female Rearing and Reproductive Management in Swine
- TN 820 Genetic Methods of Improving Dairy Cattle for the South
- S 90 Use of Highly Prolific Breed x Mutton Breed Crosses to Improve Lamb Production in Tennessee

Projects Concluded in 1986

- TN 640 Genetic Methods of Improving Dairy Cattle for the South (contributing to Regional Project S-49)
- 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 Etiology and Control of Hygomagneseimic Tetany in Ruminants Utilizing Cool Season Grasses (contributing to Regional Project S-121)

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CHILD AND FAMILY STUDIES

Proj. No.

Research Project Titles

- TN 682 Dynamics of Life Plans and Attainment of Low-income Youth: A Longitudinal Analysis (contributing to Regional Project S-171)

Projects Concluded in 1986

- TN 623 The Familial Antecedents of Adolescent Independence

Bulletins, Articles, and Reports—1986

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ENTOMOLOGY AND PLANT PATHOLOGY

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 92	Pesticide Impact Assessment Research and Data Analysis
TN 624	Tactics for Management of Soybean Pest Complexes
TN 693	Pasture and Forage Insect Pest Ecology and Control (contributing to Regional Project S-157)
TN 700	Integrated Arthropod Management for Livestock and Poultry in the Southern Region (contributing to Regional Project S-181)
TN 714	Economic Thresholds, Toxicology and Management of the Fall Armyworm and European Corn Borer in Field Corn
TN 715	The Ecological and Physiological Aspects of the Spread of <i>Moraxella bovis</i> by <i>Musca autumnalis</i>
TN 717	Insect Pest Management for Vegetable Crops
TN 719	Distribution and Ecology of Phytoparasitic Nematodes in Tennessee
TN 722	Viruses of Small Grains
TN 726	Management of Soil Microorganisms Affecting the Health and Vigor of Plants (contributing to Regional Project S-186)

- TN 730 Biological Control of Selected Arthropod Pests and Weeds Through Introduction of Natural Enemies (contributing to Regional Project S-192)
- TN 742 Detection, Identification, and Occurrence of Plant Viruses in Tennessee
- TN 749 Biology and Control of Fungus Diseases Causing Economic Losses in Cotton, Wheat, and Grain Sorghum
- TN 752 Etiology and Epidemiology of *Diaporthe* sp. and *Phomopsis* sp. Causing Soybean Stem Canker
- TN 795 Etiology and Epidemiology of Dogwood Canker
- TN 799 Host Plant Resistance and Chemical Control for Burley Tobacco Insects
- TN 801 Biosystematics of Pitscales in Tennessee
- TN 812 Etiology, Ecology, and Control of Soybean Diseases
- TN 815 Etiology and Control of Fungus Pathogens of Beans
- TN 822 Life Table Studies of Root-Knot and Cyst Nematodes
- TN 829 Management and Bionomics of Cotton Insects
- TN 830 Management Strategies for Control of Vegetable Diseases in Tennessee
- TN 836 Population Dynamics of *Heliothis* Species on Wild and Cultivated Plants in Tennessee

Projects Concluded in 1986

- TN 625 Variability of Root-Knot and Cyst Nematodes and Factors Influencing Their Population Dynamics (contributing to Regional Project S-154)
- TN 672 Ecology and Management of Cotton Insects

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- Lentz, G. L. 1986. Spray additive R/S 020 effect on bollworm control, 1984. Entomological Society of America Insecticide and Acaricide Tests 11:279.
- Miller, R. D., and Pless, C. D. 1986. Insect tolerance in potyvirus resistant burley tobacco breeding lines. Agronomy Abstracts. p. 73.
- Pless, C. D., and Shamiyeh, N. B. 1986. In-whorl treatments for fall armyworm control in late-planted field corn, 1985. Insecticide and Acaricide Tests 11:248.
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- Shamiyeh, N. B., and Pless, C. D. 1986. Insect control on burley tobacco with foliar insecticides, 1985. Insecticide and Acaricide Tests 11:366.
- Thompson, R. W., Fribourg, H. A., and Reddick, B. B. 1986. Intensity and timing of sampling for occurrence of *Acremonium coenophialum* in fescue pastures. Agronomy Abstracts, p. 123.

ENVIRONMENTAL PRACTICE

Proj. No.

Research Project Titles

TN 762

Biochemical Mechanisms of Fescue and Endotoxin Induced Agalactia (contributing to Animal Health and Disease project)

FOOD TECHNOLOGY AND SCIENCE

Proj. No.	Research Project Titles
TN 647	Maximizing the Use, Nutritive Quality, and Consumer Acceptance of Sweet Potatoes and their Products (contributing to Regional Project S-161)
TN 670	Marketability and Acceptance of Beef Produced Under Forage and Forage-Grain Management Systems (contributing to Regional Project S-123)
TN 690	Microwave Heating: Effect on Physical, Chemical and Sensory Properties of Selected Foods
TN 721	Characteristics of Antimicrobials in Foods
TN 727	Microbiological Quality and Safety of Processed Foods
TN 729	Evaluation of Tennessee Fresh and Processed Vegetables
TN 758	Food Lipids: Analysis and Effects on Quality
TN 760	Effect of Animal Composition and Processing Methods on Meat Quality
TN 768	Analysis Assay and Control of Mycotoxins in Agricultural Products
TN 807	Effect of Processing Technologies on Acceptance and Shelf Life of Manufactures Meat Products
TN 831	Sensory Evaluation of Foods: Methodological Studies
TN 832	Enzymes in Dairy Products: Characteristics, Effects, and Control
TN 834	Determination of Calcium in Dairy Products and the Concentration as Influenced by Processing
TN 835	Evaluation of the Quality and Nutritional Value of Fresh and Processed Fruit
S 89	Methods for Dairy Products: Efficiency and Relationship to Product Quality
S 95	Pesticide Residues and Their Degredation Products in Raw and Processed Foods
Projects Concluded in 1986	
TN 659	Improvement in Quality of Honey Produced in Tennessee
TN 676	Evaluation of the Quality of Fresh and Processed Fruit
TN 698	Nutritive and Quality Evaluation of the Southern Pea (<i>Vigna Unguiculata</i>) and Some of its Products
TN 702	The Use of Sodium Substitutes in the Manufacture of Dairy Products
S 88	Pesticides in/on Raw and Processed Foods

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- Christen, G. L., W. C. Wang and T. J. Ren. Comparison of the heat resistance of bacterial lipases and proteases and the effect on ultrahigh temperature milk quality. *Journal of Dairy Science*. 69:2769-2778.
- Davidson, P. M., C. Hoskins and E. Rico-Munoz. Aerobic incubation of *Clostridium perfringens* in the presence of an oxygen-reducing membrane fraction. *Journal of Food Science* 51:1585-1586.
- Davidson, P. M. and L. S. Post. Lethal effect of butylated Lydroxyandisole as related to bacterial fatty acid composition. *Applied & Environmental Microbiology*. 52:214-216.
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Tennessee Farm and Home Science Articles

- Draughon, F. A., Elahi, M. E., Churchville, D. C., and D. R. West. Pesticide inhibition of aflatoxin and zearalenone production in corn and culture. No. 140:3-8.
- Gresham, J. D. and M. J. Riemann. Effect of preslaughter fasting on carcass yield in slaughter cattle. No. 137:20-23.

Theses and Dissertations

- Castro, M. C. (M.S.). Microbiological examination of beef prepared by bacterial fermentation in brine containing papaya. August.
- Chapman, T. L. (M.S.). The development of southern peas (*V. ungu.*) into a salad bar item. June.
- Gant, H. J. (M.S.). Microbial growth and spoilage of vacuum-packaged ham slices as affected by preservation treatment. August.
- Gwin, M. D. (M.S.). A comparison of restructured steaks made from prerigar and postrigar beef. June.
- Han, M. J. (M.S.). Lipid degradation in stew with and without vegetables. March.
- Husain, N. (M.S.). Deterioration of palm oil olein and partially hydrogenated soybean oil during deep-fat frying. August.
- Jantschke, M. (M.S.). Protoplasting, regeneration and fusion of lactobacilli. August.
- Jones, K. G. (M.S.). Evaluation of sauerkraut prepared with KCl as a complete or partial replacement of NaCl. June.
- Nisbitt, H. M. (M.S.). Composition of grape cultivars grown in East and Middle Tennessee for wine production. August.

- Pace, R. D. (M.S.). Effect of subjective and objective evaluations in determining carcass composition of feeder pigs. June.
- Zimmermann, S. R. (M.S.). Characterization of microorganisms associated with pasteurized milk. August.

Papers Presented/Proceedings

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- Christen, G. L. Comparison of two highly sensitive methods for detecting protease activity. 1986 meeting of So. American Dairy Science Association.
- Christen, G. L. A rapid methods for measuring protease activity in milk using radiolabelled casein and the Charm test analyzer. 1986 meeting of American Dairy Science Association.
- Collins, J. L. Settling and clarifying sorghum juice. 1986 Meeting of National Sweet Sorghum Producers and Processors Assoc.
- Davidson, P. M. Antibiotic resistant micro-organisms in foods. 1986 SAAS.
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FORESTRY, WILDLIFE, AND FISHERIES

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 660	Game Fish Management in Tennessee Waters
TN 776	The Relationship Between Stress and Reduced Fitness in Food Fish
MS 36	Effects of Air Pollution on Radial Growth and Wood Density of Trees
MS 38	Biometrical Procedures for Tennessee Forest Management
MS 39	The Impact of Habitat Changes on Wildlife Populations in Southeastern Forests
MS 40	Marketing of Tennessee's Timber Products
MS 41	Genetic Improvement of Selected Hardwood and Coniferous Trees
MS 42	Silviculture Practices to Enhance Forest Productivity in Tennessee
MS 43	Visual Impacts of Vegetation Management on Forest Recreation
MS 44	Cytogenetic Studies of Hardwoods and Coniferous Forest Trees
MS 45	Genetic and Cultural Manipulations of Christmas Tree Species in Tennessee
MS 46	Stand Regeneration Using Containerized Seedlings
S 30	Arboretum
<i>Projects Concluded in 1986</i>	
TN 668	Warmwater Aquaculture
MS 35	Containerized and Nursery Culture of Forest Tree Seedlings
MS 37	Wildlife Population Responses to Forest Management Practices in the Southern Appalachian Forests
S 91	Responses of Wildlife to Habitat Modifications on Forests and Associated Lands in Tennessee

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MICROBIOLOGY

Proj. No.

Research Project Titles

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|--------|---|
| TN 744 | An Infected Cell Membrane Protein as a Cross Protective Vaccine for Alphaviruses |
| TN 784 | Development of Potential Enteric Coronavirus Vaccine Sources Using Recombinant DNA |
| S 93 | Production and Use of Monoclonal Antibodies Against Specific Surface Antigens of <i>Bordetella Bronchiseptica</i> |

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NUTRITION AND FOOD SCIENCES

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 689	Effect of Feed Restriction Exercise and Age on Fat Synthesis, Body Composition and Survival of Rats
TN 734	Effect of Dietary Sulfur on Analgesia
TN 735	Effect of Diet on the Metabolism of Mercury
TN 745	Carnitine Nutrition in Chronic Alcoholism
TN 746	Human Erythrocyte Na ⁺ -ATPase. Hypertension and Diet
TN 750	Changing Dietary Behavior Via Nutrition Education
TN 828	Physical and Sensory Properties of Nutritionally-Enhanced Baked Products

Bulletins, Articles, and Reports—1986

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ORNAMENTAL HORTICULTURE AND LANDSCAPE DESIGN

Proj. No.

Research Project Titles

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
TN 747	Histochemistry and Ultrastructure of Idioblasts in the Outer Integument of Cotton Ovule (<i>Gossypium hirsutum</i>)
TN 771	Cultivars, Cultural, and Mechanical Practices Evaluations in Turfgrass
TN 722	Turfgrass Pesticides
TN 833	Postpropagation Management of Tissue Cultured Liners

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PATHOBIOLOGY

Proj. No.	Research Project Titles
TN 738	Antibody Response in the Bovine Lower Respiratory Tract to Inhaled <i>Pasteurella Hemolytic</i>
TN 765	Internal Parasites in Dairy Replacement Heifers in Tennessee: Epidemiology and Strategic Control (contributing to Animal Health and Disease project)
TN 782	Cloning and Hybridization Probes in Pathogenesis Studies
TN 821	Bovine Respiratory Diseases: Risk Factors, Pathogens, Diagnosis and Management (contributing to Regional Project NC-107)
S 94	<i>In Vitro</i> Investigation of Bovine Pasteurellosis Pathogenic Mechanisms

Projects Concluded in 1986

TN 650	Bovine Respiratory Diseases (contributing to Regional Project NC-107)
TN 669	Influences of Immunological Factors on Neonatal Diseases in Food Producing Animals and Horces (contributing to Regional Project S-169)

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PLANT AND SOIL SCIENCE

<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 476	Soybean Breeding
TN 566	Evaluation and Breeding of Forage Legumes
TN 652	Influence of Crop Herbicide Management of 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-175)
TN 679	Rootstock and Interstem Effects on Pome and Stone (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 Microplasma-like Organisms Causing Diseases of Corn and Sorghum (contributing to Regional Project S-70)
TN 697	Plant Germplasm—Its Introduction, Maintenance and Evaluation (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
TN 737	Genetics and Environmental Factors Affecting Response of Soybeans To Acid Rain

- TN 757 Role of Legume Cover Crops in Conservation Tillage Production Systems (contributing to Regional Project S-201)
- TN 775 Corn Improvement
- TN 777 Environmental and Biological Stresses of Rootstocks on Peach Tree Longevity (contributing to Regional Project S-97)
- TN 778 Cotton Production Methodology
- TN 779 Variation in Soil Solution Composition in Field Environments
- TN 780 Fruit Crop Investigations
- TN 781 Environmental Adaptation and Cultural Management of Vegetable Crops
- TN 785 Ecology of Crops in Forage Management Systems
- TN 787 Low Temperature Photosynthesis, Stem Development, and Forage Quality of Tall Fescue
- TN 788 Effect of Soil, Soil Fertility Level, Added Nutrients, and Season on Crop Yields
- TN 787 Field Crop Variety Evaluation
- TN 791 Improvement of Small Grain Through Breeding
- TN 792 Soil Survey and Its Utilization in Tennessee
- TN 793 Alteration of Soil Chemical Properties Due To Continuous No-till Practices
- TN 794 Soil pH and Its Effects on Crop Growth and Nutrient Availability
- TN 798 Weed Control in Forage Crops
- TN 810 Vegetable Crop Production
- TN 813 Dark Tobacco Breeding and Cultural Practices
- TN 817 Mineralogy of Selected Soils in the Southern Region
- TN 823 Germplasm Development in Forage Grasses
- TN 824 Field Crop Responses in Plant Nutrient Applications on Soils

Projects Concluded in 1986

- TN 812 Significance and Distribution of Mineral Components in Southern Soils (contributing to Regional Project S-152)
- TN 645 Germplasm Development in Cool Season Forage Grasses
- TN 649 Field Crop Responses to Plant Nutrient Applications on Soils

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<i>Proj. No.</i>	<i>Research Project Titles</i>
TN 770	Development of Economic Alternatives for the U.S. Textile Complex
TN 840	Textile Fiber Systems for Performance, Protection and Comfort (contributing to Regional Project S-208)

Projects Concluded in 1986

TN 646	Effects of Functional Textile Finishes on Comfort (contributing to Regional Project S-163)
TN 664	Integrates Design Research for Household Energy Conservation

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Assistant

ORNAMENTAL HORTICULTURE AND LANDSCAPE DESIGN

G. D. Crater, Professor and Head

S. A. Ball, Graduate Research Assistant

J. M. Bogert, Graduate Research Assistant

L. M. Callahan, Professor

J. W. Day, Associate Professor

H. L. Dickerson, Research Associate

J. T. Dietrich, Graduate Research
Assistant

E. T. Graham, Professor

R. A. May, Graduate Research Assistant

T. P. McCracken, Graduate Research
Assistant

G. L. McDaniel, Professor

J. G. Rice, Graduate Research Assistant

D. P. Shepard, Research Associate

H. van de Werken, Professor

D. B. Williams, Professor

S. L. Wilson, Research Associate

W. T. Witte, Associate Professor

PATHOBIOLOGY

Robert L. Michel, Professor and Head of
Department

Michael A. Breider, Assistant Professor

L. N. D. Potgieter, Professor

Craig R. Reinemeyer, Assistant Professor

PLANT AND SOIL SCIENCE

- J. E. Foss, Professor and Head of Department
 T. E. Adcock, Graduate Research Assistant
 F. L. Allen, Associate Professor
 D. L. Coffey, Professor
 B. V. Conger, Professor
 G. S. Crnko, Graduate Research Assistant
 D. E. Deyton, Associate Professor
 B. N. Duck, Professor, Martin
 H. A. Fribourg, Professor
 J. G. Graveel, Assistant Professor
 C. R. Graves, Professor
 J. A. Hale, Graduate Research Assistant
 B. R. Hathcock, Associate Professor, Martin
 D. Hardin, Graduate Research Assistant
 M. Harrison, Graduate Research Assistant
 G. W. Haun, Graduate Research Assistant
 R. M. Hayes, Associate Professor, Jackson
 P. E. Hoskinson, Associate Professor, Jackson
 D. D. Howard, Associate Professor, Jackson
 J. R. Jones, Graduate Research Assistant
 M. A. Krstich, Graduate Research Assistant
 W. A. Krueger, Associate Professor
 R. Lambert, Graduate Research Assistant
 D. Landau, Graduate Research Assistant
 G. M. Lessman, Associate Professor
 R. J. Lewis, Associate Professor
 A. M. Lujan, Graduate Research Assistant
 S. Martin, Graduate Research Assistant
 R. D. Miller, Graduate Research Assistant, Greenville
 C. G. Milne, Graduate Research Assistant
 C. A. Mullins, Professor, Crossville
 A. Namiko, Graduate Research Assistant
 J. L. Oakes, Graduate Research Assistant
 T. Oliver, Graduate Research Assistant
 W. L. Parks, Professor
 B. Pennell, Graduate Research Assistant
 D. Phillips, Graduate Research Assistant
 V. H. Reich, Associate Professor
 J. H. Reynolds, Professor
 G. N. Rhodes, Jr., Assistant Professor
 C. E. Sams, Associate Professor
 B. Santhuff, Graduate Research Assistant
 M. Sellman, Graduate Research Assistant
 P. P. Shelby, Graduate Research Assistant
 P. Shelby, Graduate Research Assistant
 D. D. Songstad, Graduate Research Assistant
 G. D. Stearman, Graduate Research Assistant
 R. A. Straw, Graduate Research Assistant
 R. W. Thompson, Graduate Research Assistant
 D. D. Tyler, Associate Professor, Jackson
 A. Wenck, Graduate Research Assistant
 D. R. West, Associate Professor
 W. F. Whitehead, Graduate Research Assistant
 J. D. Wolt, Associate Professor
 J. E. Wyatt, Associate Professor, Jackson

TEXTILES, MERCHANDISING, AND DESIGN

- Jacqueline O. DeJonge, Professor and Head of Department
 Carl L. Dyer, Associate Professor
 Lisa M. Salamie, Graduate Research Assistant
 Larry C. Wadsworth, Professor

PERSONNEL CHANGES

Appointments

- Edwin L. Anderson, Graduate Research Assistant in Agricultural Economics, September 1, 1986
- K. B. Anderson, Graduate Research Assistant in Food Technology and Science, April 14, 1986
- Timothy Lynn Ashley, Graduate Research Assistant in Animal Science, July 1, 1986
- Sandra A. Ball, Graduate Research Assistant in Ornamental and Landscape Design, April 1, 1986
- W. N. G. Barron, Graduate Research Assistant in Food Technology and Science, Jan. 1, 1986
- John M. Bogert, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, June 18, 1986
- Linda L. Brenchley, Graduate Research Assistant in Agricultural Economics, June 17, 1986
- Patrick Brown, Graduate Research Assistant in Animal Science, September 1, 1986
- Harry J. Bryan, Graduate Research Assistant in Agricultural Economics, June 16, 1986
- C. H. Canaday, Assistant Professor in Entomology and Plant Pathology, February 17, 1986
- Mark R. Cantrell, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 1, 1986
- Sou Fei Chin, Graduate Research Assistant in Animal Science, September 15, 1986
- G. L. Christen, Assistant Professor in Food Technology and Science, July 1, 1986
- Sean A. Coady, Graduate Research Assistant in Agricultural Economics, September 22, 1986
- Ronald D. Davis, Sr., Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 5, 1986
- W. M. Davis, Graduate Research Assistant in Agricultural Engineering, September 22, 1986
- Joseph T. Dietrich, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, September 22, 1986
- Mark E. Downing, Graduate Research Assistant in Agricultural Economics, January 1, 1986
- Burton C. English, Associate Professor in Agricultural Economics, September 1, 1986
- Lorraine Gandy, Research Associate in Animal Science, September 1, 1986
- J. P. Goldschmid, Graduate Research Assistant in Agricultural Engineering, September 22, 1986
- Jim W. Habera, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, July 1, 1986
- Kimberly L. Haden, Assistant Professor in Agricultural Economics, October 10, 1986
- S. D. Hardin, Graduate Research Assistant in Plant and Soil Science, July 1, 1986
- M. P. Harrison, Graduate Research Assistant in Plant and Soil Science, September 1, 1986
- Marcela Heim-Edelman, Graduate Research Assistant in Nutrition and Food Sciences, September 1, 1986
- D. D. Hensley, Graduate Research Assistant in Entomology and Plant Pathology, September 22, 1986
- K. D. Howard, Graduate Research Assistant in Agricultural Engineering, June 8, 1986

- Petr Hradecky, Graduate Research Assistant in Animal Science, August 1, 1986
- Michael Jantschke, Graduate Research Assistant in Food Technology and Science, Jan. 1, 1986
- S. W. Jenkins, Senior Research Assistant in Entomology and Plant Pathology, April 1, 1986
- Roger Dale Johnson, Graduate Research Assistant in Animal Science, September 8, 1986
- Vijay Juneja, Graduate Research Assistant in Animal Science, May 1, 1986
- M. S. Kearney, Graduate Research Assistant in Agricultural Engineering, September 1, 1986
- B. S. Kennedy, Graduate Research Assistant in Entomology and Plant Pathology, September 1, 1986
- Gregory A. Kiess, Graduate Research Assistant in Animal Science, September 1, 1986
- J. W. Kleene, Graduate Research Assistant in Agricultural Engineering, September 22, 1986
- T. H. Klindt, Assistant Dean, Agricultural Experiment Station, July 1, 1986
- Lisa R. Knauf, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 1, 1986
- R. E. Lambert, Graduate Research Assistant in Plant and Soil Science, October 1, 1986
- D. R. Landau, Graduate Research Assistant in Plant and Soil Science, July 1, 1986
- L. L. Larkin, Graduate Research Assistant in Food Technology and Science, July 1, 1986
- Ben Lifsey, Research Assistant in Animal Science, June 16, 1986
- J. B. Lown, Graduate Research Assistant in Agricultural Engineering, January 1, 1986
- Xiaominn Liu, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 8, 1986
- Mark A. Madden, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 22, 1986
- S. A. Martin, Graduate Research Assistant in Plant and Soil Science, September 1, 1986
- Roger A. May, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, September 18, 1986
- Jerry McClain, Graduate Research Assistant in Animal Science, March 24, 1986
- Janet McElroy, Research Assistant in Nutrition and Food Sciences, April 14, 1986
- Peter K. McLean, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 1, 1986
- A. P. Nimako, Graduate Research Assistant in Plant and Soil Science, September 1, 1986
- T. L. Oliver, Graduate Research Assistant in Plant and Soil Science, January 21, 1986
- D. O. Onks, Superintendent, Highland Rim Experiment Station, March 18, 1986
- M. P. Penfield, Professor in Food Technology and Science, July 1, 1986
- B. D. Pennell, Graduate Research Assistant in Plant and Soil Science, April 1, 1986
- D. H. Phillips, Graduate Research Assistant in Plant and Soil Science, January 8, 1986
- P. Qian, Research Associate in Entomology and Plant Pathology, March 1, 1986
- Patricia Redlinger, Assistant Professor in Nutrition and Food Sciences, July 1, 1986

- Julie G. Rice, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, January 1, 1986
- Kevin Roberson, Graduate Research Assistant in Animal Science, September 4, 1986
- L. E. Rogers, Graduate Research Assistant in Entomology and Plant Pathology, September 16, 1986
- B. R. Ross, Graduate Research Assistant in Entomology and Plant Pathology, July 1, 1986
- Douglas A. Rugh, Graduate Research Assistant in Agricultural Economics, January 1, 1986
- B. A. Santhuff, Graduate Research Assistant in Plant and Soil Science, August 1, 1986
- R. A. Schell, Graduate Research Assistant in Food Technology and Science, Jan. 17, 1986
- Steven G. Seibert, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 1, 1986
- M. V. Sellman, Graduate Research Assistant in Plant and Soil Science, July 28, 1986
- Kathy L. Sharpe, Graduate Research Assistant in Animal Science, September 1, 1986
- P. W. Shelby, Graduate Research Assistant in Plant and Soil Science, September 1, 1986
- V. K. Smalley, Graduate Research Assistant in Entomology and Plant Pathology, September 1, 1986
- S. Kim Snyder, Graduate Research Assistant in Agricultural Economics, September 22, 1986
- Larry W. VanTassell, Assistant Professor in Agricultural Economics, December 1, 1986
- G. T. Weaver, Professor and Head, Department of Forestry, Wildlife, and Fisheries, October 20, 1986
- Mack A. Willhite, Graduate Research Assistant in Agricultural Economics, September 22, 1986
- A. R. Wenck., Graduate Research Assistant in Plant and Soil Science, July 1, 1986
- Arnold G. Woodward, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, September 1, 1986

Changes in Title

- E. C. Bernard to Professor in Entomology and Plant Pathology, July 1, 1986
- David B. Eastwood to Professor in Agricultural Economics in Agricultural Economics, July 1, 1986
- James C. Forcherio to Research Associate in Animal Science, September 8, 1986
- W. E. Hammit to Professor in Forestry, Wildlife, and Fisheries, July 1, 1986
- T. H. Klindt, Professor in Agricultural Economics, to Assistant Dean of Agricultural Experiment Station, July 1, 1986
- R. L. Little to Professor in Forestry, Wildlife, and Fisheries, July 1, 1986
- L. H. Self to Research Assistant in Entomology and Plant Pathology, June 5, 1986
- J. I. Sewell to Associate Dean of Agricultural Experiment Station, July 1, 1986
- Linda D. Smith to Research Assistant in Animal Science, September 1, 1986
- A. R. Womac, from Graduate Research Assistant to Instructor in Agricultural Engineering, September 22, 1986

Educational Leave

W. E. Hart, Instructor in Agricultural Engineering, August 22, 1986

Retirement

J. A. Bacon, Research Associate in Animal Science, December 30, 1986

L. M. Safley, Superintendent, Highland Rim Experiment Station, March 31, 1986

M. C. Bell, Professor of Animal Science, December 30, 1986

T. J. Whatley, Associate Dean, Agricultural Experiment Station, June 30, 1986

Terminations

Adesine A. Adekunmisi, Graduate Research Assistant in Animal Science, December 12, 1986

C. L. Davis, Graduate Research Assistant in Agricultural Economics, October 14, 1986

K. B. Anderson, Graduate Research Assistant in Food Technology and Science, Sept. 15, 1986

Joy A. Davidson, Graduate Research Assistant in Animal Science, August 31, 1986

Landon Backus, Graduate Research Assistant in Animal Science, March 14, 1986

Dianne Dawes, Graduate Research Assistant in Animal Science, June 18, 1986

K. D. Banker, Graduate Research Assistant in Agricultural Economics, February 28, 1986

Wanda Dodson, Research Associate in Nutrition and Food Sciences, August 31, 1986

J. J. Beringer, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 1, 1986

B. L. Emerton, Graduate Research Assistant in Agricultural Engineering, December 31, 1986

J. A. Welch Bohannon, Graduate Research Assistant in Agricultural Economics, August 31, 1986

R. G. Epperson, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, August 20, 1986

Robert Cato, Graduate Research Assistant in Animal Science, May 31, 1986

K. W. Ferguson, Graduate Research Assistant in Agricultural Economics, September 30, 1986

C. J. Catanzaro, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, November 30, 1986

J. H. Fowler, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 15, 1986

Vanessa R. Chandler, Graduate Research Assistant in Textiles, Merchandising, and Design, June 30, 1986

J. J. Gockowski, Graduate Research Assistant in Agricultural Economics, August 31, 1986

C. M. Cuskaden, Associate Professor in Agriculture Economics, March 31, 1986

D. A. Graves, Graduate Research Assistant in Plant and Soil Science, September 30, 1986

T. E. Daly, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, September 12, 1986

Teri Ingle, Graduate Research Assistant in Animal Science, August 31, 1986

- Michael Jantschke, Graduate Research Assistant in Food Technology and Science, Sept. 15, 1986
- Margaret Jordan, Graduate Research Assistant in Animal Science, June 13, 1986
- T. H. Keith, Graduate Research Assistant in Plant and Soil Science, February 28, 1986
- D. A. Lietzke, Associate Professor in Plant and Soil Science, June 30, 1986
- L. L. Marden, Graduate Research Assistant in Plant and Soil Science, July 31, 1986
- C. E. Meier, Graduate Research Assistant in Agricultural Economics, July 31, 1986
- Debra Miller, Research Assistant in Nutrition and Food Sciences, April 18, 1986
- Rissa Mitchell, Graduate Research Assistant in Animal Science, September 12, 1986
- R. J. Menard, Graduate Research Assistant in Agricultural Economics, November 30, 1986
- S. Monteith, Graduate Research Assistant in Agricultural Economics, September 12, 1986
- F. S. Mucke, Graduate Research Assistant in Agricultural Engineering, November 30, 1986
- S. A. Pozzanghera, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, July 14, 1986
- P. Qian, Research Associate in Entomology and Plant Pathology, October 31, 1986
- B. R. Ross, Graduate Research Assistant in Entomology and Plant Pathology, September 30, 1986
- C. M. Rudolph, Graduate Research Assistant in Agricultural Engineering, December 31, 1986
- J. M. Ruter, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, August 31, 1986
- Elizabeth M. Schilling, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, June 30, 1986
- K. B. Schwarz, Graduate Research Assistant in Entomology and Plant Pathology, April 30, 1986
- Larry A. Swabe, Graduate Research Assistant in Animal Science, August 31, 1986
- Ruthann B. Swanson, Graduate Research Assistant in Nutrition and Food Sciences, April 30, 1985
- S. E. Svenson, Graduate Research Assistant in Ornamental Horticulture and Landscape Design, August 31, 1986
- N. J. Taylor, Pesticide Impact Coordinator in Entomology and Plant Pathology, November 14, 1986
- W. R. Taylor, Graduate Research Assistant in Entomology and Plant Pathology, April 14, 1986
- Mary C. Valdrighi, Graduate Research Assistant in Nutrition and Food Sciences, July 31, 1986
- W. J. Watson, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, December 31, 1986
- Lisa A. Weaver, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, December 31, 1986
- Adrienne A. White, Graduate Research Assistant in Nutrition and Food Sciences, August 31, 1986
- A. G. Woodward, Graduate Research Assistant in Forestry, Wildlife, and Fisheries, May 31, 1986
- S. R. Zimmerman, Graduate Research Assistant in Food Technology and Science, March 31, 1986

Transfers

Marjorie P. Penfield, Professor in Nutrition and Food Sciences, to Food Technology, July 1, 1986

R. A. Reynolds, Research Associate, Animal Science, to Research Associate, Knoxville Experiment Station, July 1, 1986