

# PLAN OF WORK

TENNESSEE 1890 AGRICULTURAL RESEARCH  
COOPERATIVE AGRICULTURAL RESEARCH PROGRAM  
TENNESSEE STATE UNIVERSITY

Federal Fiscal Years

2000-2004

July 15, 1999

TABLE OF CONTENT

	<b>PAGE</b>
Point of Contact	1
Executive Summary	2
Planned Programs	3
Planned Multi-Institutional, Multidisciplinary, Multi-State Activities	4
Planned Integrated Research and Extension Activities	5
Program Description	6
Goal 1: An Agricultural System that is Highly Competitive in the Global Economy	6
Planned Programs 1 – 4	6
Statement of the Issues	
Performance Goals	
Output Indicators	
Outcome Indicators	
Key Program Components	
Internal and External Linkages	
Target Audiences	
Program Duration	
Allocated Resources	
Goal 2: A Safe and Secure Food and Fiber System	14
Planned Programs 5 – 6	14
Statement of the Issues	
Performance Goals	
Output Indicators	
Outcome Indicators	
Key Program Components	
Internal and External Linkages	
Target Audiences	
Program Duration	
Allocated Resources	
Goal 3: A Healthier, Well-Nourished Population	17
Planned Programs 7 – 8	17
Statement of the Issues	
Performance Goals	
Output Indicators	
Outcome Indicators	
Key Program Components	
Internal and External Linkages	
Target Audiences	
Program Duration	
Allocated Resources	
Goal 4: Greater Harmony between Agriculture and the Environment	20

Planned Programs 9 – 12	20
Statement of the Issues	
Performance Goals	
Output Indicators	
Outcome Indicators	
Key Program Components	
Internal and External Linkages	
Target Audiences	
Program Duration	
<i>Allocated Resources</i>	23
<b>Goal 5: Enhanced Economic Opportunities and Quality of Life for Americans</b>	
Planned Programs 13	23
Statement of the Issues	
Performance Goals	
Output Indicators	
Outcome Indicators	
Key Program Components	
Internal and External Linkages	
Target Audiences	
Program Duration	
Allocated Resources	
Stakeholder Input Process	25
Scientific Merit Review Process	25
Fiscal and Human Resources	25
Certification	25

**Point of Contact:** All questions and comments regarding this Plan of Work should be directed to Research Director at Tennessee State University.

Stephen H. Kolison Jr., Ph.D.  
Research Director  
Cooperative Agricultural Research Program

## Tennessee State University

125 Research and Extension Building  
3500 John A. Merritt Blvd.  
Nashville, Tennessee 37209-1561

Phone: 615/ 963-5761; Voice Mail: 615/ 963-2194; Fax: 615/963-5532

E-mail: [skolison@picard.tnstate.edu](mailto:skolison@picard.tnstate.edu)

URL: <http://www.tnstate.edu/carp>

## *EXECUTIVE SUMMARY*

The Cooperative Agricultural Research Program at Tennessee State University is grateful for the opportunity to partner with the United States Department of Agriculture, and the State of Tennessee, industry, the academic community, and other public sector entities to improve the quality life for all citizens of our state and people in other regions. This plan of work represents our commitment to address the needs of our state, and society in general. It is also a manifestation of our efforts to build strong, realistic, and mutually beneficial partnerships, to remain relevant to our stakeholders, and to pursue new frontiers in agricultural research.

This Plan of Work was developed with input from internal stakeholders (faculty, researchers, students, staff, Cooperative Extension personnel and administrators at Tennessee State University) and external stakeholders (private citizens and industry). This Plan of Work is what we intend to undertake during the period October 1, 1999 through September 30, 2004. The research endeavors included were planned under the National Research, Extension, and Education (REE) goals set by the United States Department of Agriculture. The goals are as follow:

1. An agricultural system that is highly competitive in the global economy;
2. A safe and secure food and fiber system;
3. A healthier, well-nourished population;
4. Greater harmony between agriculture and the environment;
5. Enhanced economic opportunities and quality of life for Americans.

Under the REE goals, we plan to implement 13 multidisciplinary programs. The programs will address some of the concerns of Tennessee's small farmers, larger producers, and families. It will seek to make our food and environment safer, and explore economic opportunities for our citizens.

## PLANNED PROGRAMS

Thirteen research programs have been planned to address the needs of our stakeholders. These programs are as follow:

**GOAL 1. AN AGRICULTURAL PRODUCTION SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY**

- Program 1. Alternative Livestock and Poultry
- Program 2. Nursery Crop/Green Industry Enhancement
- Program 3. Small Farms Viability
- Program 4. Forest Management for Minority Landowners

**GOAL 2. A SAFE AND SECURE FOOD AND FIBER SYSTEM**

- Program 5. Salmonella in Poultry
- Program 6. Bacteria in Fruits and Vegetables

**GOAL 3. A HEALTHIER, MORE WELL-NOURISHED POPULATION**

- Program 7. Nutrition Education for Disadvantaged Populations
- Program 8. Healthier Eating

**GOAL 4. GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT**

- Program 9. Integrated Pest Management
- Program 10. Sustainable Agriculture
- Program 11. Water Quality
- Program 12. Improving Environmental Quality

**GOAL 5. ENHANCED ECONOMIC OPPORTUNITIES AND QUALITY OF LIFE FOR AMERICANS**

- Program 13. Economic Opportunity Enhancement

PLANNED MULTI-INSTITUTIONAL, MULTIDISCIPLINARY,  
MULTI-STATE ACTIVITIES

The planned programs for Tennessee State University Cooperative Agricultural Research Program for the period FY 2000-2004 are all multi-disciplinary in nature, and will be carried by multi-disciplinary research teams. Some of the planned programs are multi-state and multi-institutional. The matrix below provides a list of planned programs that will be multi-institutional and multi-state.

Planned Programs	Institutions	States
Program 1 (Goat Research Component) – Regional	Alcorn State University, Fort Valley State University, Kentucky State University, Langston University, Prairie View A&M University, Southern University and A&M College, Tennessee State University, Virginia State University	Mississippi, Georgia, Kentucky, Oklahoma, Texas, Louisiana, Tennessee, Virginia
Program 3 (Medicinal Crops Research Component) – Regional	Alabama A&M University, Delaware State University, Fort Valley State University, Florida A&M University, Kentucky State University, Lincoln University, North Carolina A&T University, South Carolina State University, Tuskegee University, Tennessee State University, University of Maryland Eastern Shore, University of Arkansas at Pine Bluff	Alabama, Delaware, Georgia, Florida, Kentucky, Missouri, North Carolina, South Carolina, Tennessee, Maryland, Arkansas
Programs 2 and 4	COLLABORATION WITH UNIVERSITY OF TENNESSEE	Tennessee
Program 8	Collaboration with Kansas State University	Kansas
Program 11 (Streamside buffers component)	Collaboration with Iowa State University	Iowa

## *PLANNED INTEGRATED RESEARCH AND EXTENSION ACTIVITIES*

Tennessee State University 1890 Research and Extension collaborate in a number of areas. This collaboration is expected to grow further during the FY 2000-2004 period with Research activities fully integrated with Extension activities. For example, in FY 2000, the two units will jointly fund positions in food safety and nutrition, and livestock production. The matrix below gives the planned integrated Research and Extension activities that we intend to implement.

Unit	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
TSU 1890 Research	Programs 1, 3, and 4	Programs 5 and 6	Program 7		Program 13
TSU 1890 Extension	Programs 1, 3, and 4	Programs 5 and 6	Program 7		Program 13



## PROGRAM DESCRIPTION

### **GOAL 1. AN AGRICULTURAL PRODUCTION SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY**

#### **PLANNED PROGRAMS**

- Program 1. Alternative Livestock and Poultry
- Program 2. Nursery Crop/Green Industry Enhancement
- Program 3. Small Farms Viability
- Program 4. Forest Management for Minority Landowners

#### **STATEMENT OF THE ISSUES**

##### Livestock and Poultry

To enhance the competitiveness of animal agriculture in Tennessee, production systems for alternative livestock and poultry should be explored. This is necessary because of the following:

- 1 The limited acreage typically found on small farms and the decreasing amount of available pastureland affect the economic viability of producing beef cattle;
- 2 The desire for alternative meat is increasing because of an increasingly diverse U.S. consumer demographic;
- 3 The demand for tobacco products, a major cash crop in Tennessee, is decreasing due to health concerns.

In addition to exploring for alternatives to traditional livestock and poultry production, other issues that currently affect the production of traditional livestock must also be addressed. Among these issues is below optimum reproduction.

Reproductive efficiency is of utmost economic importance to cow-calf operators. Poor reproductive rates in a cowherd are often a result of poor nutritional management. Also, cattle grazing on tall fescue forage infected with a fungal endophyte develop a condition known as fescue toxicosis. This condition affects reproductive efficiency. Therefore, if livestock producers in Tennessee are to be competitive, factors affecting reproduction, including the two mentioned above must be addressed. Our plan of work for animal agriculture includes research for finding alternatives to traditional livestock and poultry production and assessing the impacts of nutritional supplements and fescue toxicosis on reproductive efficiency in beef cattle operations.

##### Nursery Crop/Green Industry

The nursery and landscape industry, often referred to as the green industry, has emerged as one of the most important economic sectors in Tennessee. As an agricultural crop, only cotton, soybeans and tobacco surpass the green industry in Tennessee. While the overall number of farms in Tennessee has decreased over the past twenty years, the number of farms growing ornamental crops has steadily increased over the same time period. This steady increases in size and value of the Tennessee green industry has been attributed to the aging of the 'baby boomer' generation. As this generation reaches its peak earning and leisure years, it is expected that more of their income will become available for items such as landscaping and pleasure gardening.

The increase in size of the green industry has resulted in increased consumer awareness of landscape plants. Also marketing competition has become more severe, and plants that can fill under-represented niches are destined to be useful and profitable to the industry. Furthermore, the increase in consumer demand for nursery crops has generated a labor shortage in the industry.

The growing importance of the green industry to the economy of Tennessee, and the nation, necessitates the development of research programs that will address some of the problems that the industry faces with

the overall goal of making it more competitive and profitable. Some of these problems include the limitation of the number of plants that can meet winter demand, the shortage of well trained personnel for the industry, and the lack of current information that can be used in policy making that could benefit the industry. Therefore, our program will focus on providing the market with more nursery crops that can meet winter needs, critical information on the industry that can be used by policy makers, and the production of highly qualified graduates for the green industry.

### Small Farms

Operators of small farms in America own about 71 percent of all farmland and contribute 41percent to the agricultural sector's assets. Many of these farmers are facing a number of challenges including the reduction of government subsidies for certain crops such as tobacco, the decline in farm-generated incomes, and the loss of markets due to the aggregation of agriculture by major corporations. Currently, many small farm operators need off-farm jobs, due to their inability to obtain an adequate return from farming. Research aimed at enhancing the productivity, profitability, and viability of small farms is needed. Furthermore, there is a need to explore and introduce non-traditional high value niche-crops that can be used by these operations to remain economically viable. This research will focus on assessing further the problems faced by small farmers with the goal of providing more viable solutions. Also, our research will lead to the development and introduction of medicinal plants as alternative agronomic crops for these farmers.

### Forest Management

A significant number of minorities in the U.S. South own forestland. It has been found that these lands are not contributing significantly to the income of these owners. Among the reasons that have been attributed to this condition is the lack of sustainable forest management knowledge among these owners. In view of this, our research will assess the constraints faced by minority forestland owners in Tennessee, and develop innovative technical assistance programs that will empower them to generate more income from their lands.

## **Performance Goal 1.1:                      Development of a Competitive Animal Production System for Limited Resources Farmers in Tennessee**

### **Output Indicators**

- Better understanding of animal production systems for the limited resource farmer
- Refereed scientific publications, presentations at scientific meetings, popular press articles, exhibits at trade shows, presentations to industry groups, web sites, field days conducted relative to the objectives of the program
- Number of farmers served
- Enhancement of research capacity

### **Outcome Indicators**

- New information on poultry and livestock production in Tennessee
- Availability of alternatives to traditional poultry and livestock production
- Income opportunities for small farmers in Tennessee

## **Key Program Components**

- 1.1a. Develop and introduce a competitive goat production system for small farmers in Tennessee as an alternative to beef cattle production, tobacco farming, and other farming activities for which they are losing markets, or are likely to lose market share.
- 1.1b. Provide an alternative to traditional poultry production to small farmers in Tennessee by developing and introducing management practices for improving reproductive efficiency of guinea fowl breeders.
- 1.1c. Assess metabolic indices in cattle consuming endophytic tall fescue to identify mechanisms through which ergopeptine alkaloids linked to fescue toxicosis reduce productivity in the beef cattle production system.
- 1.1d. Determine the effect of vitamin E on reproductive efficiency of beef cows in small beef cattle operations in Tennessee.

## **Internal and External Linkages**

- Collaborations with other departments at Tennessee State University
- Collaboration with Cooperative Extension at Tennessee State University
- Collaboration with other 1890 institutions on goat research
- USDA ARS

### **Targeted Audiences**

- Farmers
- Students
- Researchers
- Public officials
- Consumers of goat meat, beef, poultry, and other foods

### **Program Duration**

- One to five years

### **Allocated Resources**

- Allocation of resources will be based on the level of funding received from USDA and the State of Tennessee

### **Performance Goal 1.2:      Increasing the Competitiveness of the Nursery Crop/Green Industry in Tennessee**

#### **Output Indicators**

- Refereed scientific publications, presentations at scientific meetings, popular press articles, exhibits at trade shows, presentations to industry groups, web sites, field days conducted relative to the objectives of the program.
- Number of farmers or nursery owners served
- Enhancement of research capacity

#### **Outcome Indicators**

- New improved cultivars released
- Quantity of sales of the improved genera
- Number of producers growing the improved cultivars
- Increased market demand for the genera improved
- Availability of alternatives to traditional poultry and livestock production
- Income opportunities for small farmers in Tennessee

## **Key Program Components**

- 1.2a. Improve selected plant genera to broaden their appeal to consumers and thus improve the competitiveness of the nursery industry in Tennessee.
- 1.2b. Develop a system for introducing selected improved plants to small farmers in Tennessee as alternatives to tobacco farming and other farming activities for which they are losing markets or are likely to lose market share.
- 1.2c. Analyze the current structure of the green industry in Tennessee.
- 1.2d. Assess the size of selected segments of the green industry and determine the economic impact of the nursery industry on the state economy.
- 1.2e. Determine key factors affecting consumer demand for nursery products and landscape services.
- 1.2f. Assess growth prospects of the nursery industry under short, medium, and long term scenarios.
- 1.2g. Identify and evaluate market channels, marketing and merchandising practices, and barriers associated with the development of domestic and international markets for nursery/greenhouse products.
- 1.2h. Train students for employment and entrepreneurial opportunities in the green industry.

## **Internal and External Linkages**

- Collaborations with other departments at Tennessee State University
- Collaboration with Cooperative Extension at Tennessee State University
- USDA ARS
- Tennessee Nursery and Landscape Association
- Middle Tennessee Nursery Association
- Tennessee Flower Growers Association

## **Targeted Audiences**

- Farmers
- Students
- Researchers
- Public officials
- Ornamental plant producers
- Plant propagators
- Garden Centers
- Landscape architects
- Landscape maintenance companies
- Nursery and landscape organizations
- Ornamental and landscape plant consumers

### **Program Duration**

- Program will continue for five years

### **Allocated Resources**

- Allocation of resources will be based on funding from USDA and the State of Tennessee

### **Performance Goal 1.3:      Enhancing the Income of Small Farmers through Innovative Marketing Approaches and Developing Alternative Agronomic Crops**

#### **Output Indicators**

- Presentations of results
- Refereed scientific publications, popular press articles, exhibits at trade shows, presentations to industry groups, web sites, field days conducted relative to the objectives of the program
- Number of farmers served
- Enhancement of research capacity
- Student training

#### **Outcome Indicators**

- New information for policy making on small farm issues
- New cultivar release
- Availability of alternatives to traditional agronomic crops
- Income opportunities for small farmers in Tennessee

#### **Key Program Components**

- 1.3a. Identify, breed and propagate plants with pharmacological values for introduction to small farmers in Tennessee as an alternative to tobacco farming, and other farming activities for which they are losing markets or are likely to lose market share.
- 1.3b. Develop a system for introducing medicinal crops farming to small farmers in Tennessee as alternative agronomic crops.
- 1.3c. Assess production and marketing practices of small farmers with the goal of enhancing the productivity, profitability and viability of their farms.

### **Internal and External Linkages**

- Collaborations with other departments at Tennessee State University
- Collaboration with Cooperative Extension at Tennessee State University
- USDA ARS
- Collaboration with other 1890 institutions on medicinal crop research
- National Institutes of Health

### **Targeted Audiences**

- Farmers
- Students
- Researchers
- Public officials
- Ornamental plant producers
- Plant propagators
- Nursery and ornamental scientists
- Health care industry

### **Program Duration**

- One to five years

### **Allocated Resources**

- Allocation of resources will be based on the level of funding received from USDA and the State of Tennessee

**Performance Goal 1.4:      Enhancing the Income of Minority or Limited Resource Forestland Owners through Sustainable Forest Management Practices**

### **Output Indicators**

- Better understanding of forest management constraints faced by minority forestland owners
- Refereed scientific publications, presentations at professional meetings, popular press articles, exhibits at trade shows, presentations to industry groups, web sites, field days conducted relative to the objectives of the program
- Number of minority forestland owners served
- Enhancement of research capacity

## **Outcome Indicators**

- New information on forest management constraints faced by minority forestland owners.
- Enhanced income opportunities for minority forestland owners

## **Key Program Components**

- 1.4a. Identify and minimize the forest management constraints faced by minority or limited resources forestland owners in Tennessee.

## **Internal and External Linkages**

- Collaborations with other departments at Tennessee State University
- Collaboration with Cooperative Extension at Tennessee State University
- USDA Forest Service
- Collaboration with other 1890 institutions
- Collaboration with Tennessee Department of Agriculture – Division of Forestry

## **Targeted Audiences**

- Minority forestland owners
- Students
- Researchers
- Public officials

## **Program Duration**

- Program will continue for five years

## **Allocated Resources**

- Allocation of resources will be based on the level of funding received from USDA and the State of Tennessee



## **GOAL 2. A SAFE AND SECURE FOOD AND FIBER SYSTEM**

### **PLANNED PROGRAMS**

- Program 5. Salmonella in Poultry
- Program 6. Bacteria in Fruits and Vegetables

### **STATEMENT OF THE ISSUES**

Food borne illness has been rated as one of the greatest health problems in the United States. In recent times there have been several food poisoning incidents that have resulted in death or life threatening conditions. As many as 80 million illnesses and 9,000 death per year are attributed to food contamination. The cost for treating these illnesses is estimated to range from \$6 billion to \$37 billion annually.

Bacteria and other microorganisms that are found widely throughout nature cause food borne illness. Among these microorganisms is salmonella. This bacterium is usually found in poultry. Considering the high degree of consumption of poultry by Americans, it is not very difficult to understand the importance of salmonella as a threat to food safety.

In addition to salmonella in poultry, other sources of food borne illness are bacteria found on or in fruits and vegetables. Contaminated fruits and vegetables pose tremendous hazards given that they are eaten raw. Furthermore, and extremely important is that infants are usually encouraged to consume vegetables and fruits. Given that the immune system of infants is less developed than adults, the consequences of consuming unsuspecting contaminated fruits and vegetables are likely to be more severe for them than for adults.

Recognizing this serious health care threat to the American public, our plan of work proposes to study the resistance of microorganisms such as salmonella to stresses such high temperatures, and to evaluate current methods used to reduce bacteria and other microorganisms on fruits and vegetables.

### **Performance Goal 2.1: Improving the Safety of Food through Detection and Surveillance**

#### **Output Indicators**

- Increased understanding of the resistance of salmonella to stress
- Increased understanding of the strengths and weaknesses of current methods of reducing dangerous microorganisms on fruits and vegetables
- Refereed scientific publications, presentations at scientific meetings, exhibits and presentations at scientific conferences, popular press articles, exhibits at trade shows,

presentations to industry groups, web sites, field days conducted relative to the objectives of the program

- Enhancement of research capacity

### **Outcome Indicators**

- New information on salmonella and other microorganisms found on fruits and vegetables
- A more informed public about food safety issues
- A more cautious public about food borne illness

### **Key Program Components**

- 2.1a. Assess the levels of bacteria on fruits and vegetables that are usually eaten raw, and evaluate current methods used by consumers for reducing the incidence of food borne illness.
- 2.1b. Elucidate the mechanism for enhanced resistance of microorganisms after exposure to various physical conditions or stress.

### **Internal and External Linkages**

- Collaborations with other departments at Tennessee State University
- Collaboration with Cooperative Extension at Tennessee State University
- USDA ARS
- Department of Health and Human Services
- Public Health Organizations

### **Targeted Audiences**

- Families
- Students
- Researchers
- Public officials
- Consumers of poultry, fruits, and vegetables
- Health care industry

### **Program Duration**

- One to five years

## **Allocated Resources**

- Allocation of resources will be based on the level of funding received from USDA and the State of Tennessee

### **GOAL 3. A HEALTHIER, MORE WELL-NOURISHED POPULATION**

#### **PLANNED PROGRAMS**

- Program 7. Nutrition Education
- Program 8. Healthy Eating

#### **STATEMENT OF THE ISSUES**

##### Nutrition Education

The United States has a longstanding commitment to food and nutrition security. There are currently fourteen food assistance programs that are Federally funded, and an almost uncountable number of non-federally funded programs. Unfortunately, few of these programs provide nutrition education. Access to nutrition education messages by individuals in lower income levels may be limited. A recently published article recommended that greater emphasis be placed on nutrition education for disadvantaged groups. The National Cancer Institute initiated the “5 A Day” Program several years ago in response to the Year 2000 Health Goal for all Americans to eat at least five servings of fruits and vegetables a day. Although this is an aggressive program, the progress that has been made in achieving the “5 A Day” goal is not as great for limited resource persons. The reasons for this lack of progress among limited resources persons may include the lack of funds to purchase such items and the lack of knowledge of what is included in the fruit and vegetable group.

Thus, nutrition educational challenge becomes three-fold; i.e. educating consumers with limited resources about dietary needs, providing them with ideas on how to use the food items that are available, and advising them in their purchasing practices. Therefore, we propose to evaluate the nutrition knowledge of individuals receiving food assistance, design appropriate educational materials that meet their specific needs, and evaluate the effectiveness of these materials.

##### Healthy Eating

An understanding of food consumption and the difficulties in changing consumption patterns are critical to improving human health and wellbeing. One of the barriers to understanding consumption is the difficulty in measuring what people eat. This is especially profound when it comes to fruits and vegetables, given that they vary in size and shape. While researchers have established “size choices” i.e. small, medium, or large as reporting options for some fruits, there is limited knowledge on whether these terms mean the same to the general public. Thus, when one is reporting that he or she has eaten a “medium” size serving of a food, there may be a discrepancy in the actual amount consumed.

Portion size estimation aids are a primary component of the method used to collect food consumption information in national and regional surveys. These aids are critical to assessing the dietary status of Americans. To understand and change food consumption behavior, we must know what and how much an individual consumes. Included in the Ten-year comprehensive plan for the National Nutritional Monitoring and related research program is the need to "identify ways to increase comparability within a dietary method." In view of the foregoing, we propose to evaluate methods of reporting portion size for selected fruits and vegetables with the overall goal of improving existing methods, or developing new and more effective ones.

**Performance Goal 3.1: Improving the Nutritional Wellbeing of the Citizens of Tennessee**

**Output Indicators**

- Increased understanding of nutrition education needs of persons receiving food assistance
- Increased understanding of barriers to fruit and vegetable consumption by food assistance recipients
- Increased understanding of the problems associated with dietary assessment
- Increased understanding of the strength and weakness of current methods used to measure food consumption
- Refereed scientific publications, presentations at scientific meetings, popular press articles, exhibits at professional meetings and presentations to industry groups, web sites,
- New methods for estimating portion size
- Enhancement of research capacity

**Outcome Indicators**

- New information on healthier eating
- A more informed public about the benefits of proper nutrition
- A public more informed about the health benefits of fruits and vegetables
- Increased consumption of fruits and vegetables by users of food assistance programs
- New information on the role of portion size

**Key Program Components**

- 3.1a. Improve or develop more effective methods for assessing fruit and vegetable consumption.
- 3.1b. Improve or develop means of teaching food assistance program recipients about the benefits of fruit and vegetable consumption.

### **Internal and External Linkages**

- Collaborations with other departments at Tennessee State University
- Collaboration with Cooperative Extension at Tennessee State University
- Collaboration with USDA
- Collaboration with Kansas State University

### **Targeted Audiences**

- Families
- Students
- Researchers
- Public officials
- Consumers of fruits and vegetables
- Food assistance program participants

### **Program Duration**

- One to five years

### **Allocated Resources**

- Allocation of resources will be based on the level of funding from USDA and the State of Tennessee

## **GOAL 4. GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT**

### **PLANNED PROGRAMS**

- Program 9. Integrated Pest Management
- Program 10. Sustainable Agriculture
- Program 11. Water Quality
- Program 12. Improving Environmental Quality

### **STATEMENT OF THE ISSUES**

The nursery industry, the second largest industry in Tennessee, shows promising trends for the future. However, the invasion of highly destructive nursery crop pests and diseases has necessitated the rapid development of pest and disease control programs, mainly based on the use of highly toxic chemical pesticides. Heavy use of these chemicals is often unnecessary and may lead to environmental degradation. The environmental safety of these chemicals begs for studies on their persistence and movement in soil and surface water, as well as the evaluation and development of alternative pest and disease control methods. Therefore, we plan to undertake research projects during the next five-year period that will develop integrated approaches to managing pests that economically affect nursery crops in Tennessee. This plan also includes the development or enhancement of sustainable agricultural practices, surface water protection, and the overall improvement of the environment.

### **Performance Goal 4.1: Reduction of Environmental Contamination in Nursery Crop Operations**

#### **Output Indicators**

- Better understanding of agricultural practices that take into consideration environmental protection
- Refereed scientific publications, popular press articles, exhibits at trade shows, presentations at scientific meetings and to industry groups, web sites, field days conducted relative to the objectives of the program
- Demonstration blocks
- Well-trained graduates
- Enhancement of research capacity

## Outcome Indicators

- New methodologies for decreasing environmental degradation
- Availability of sustainable alternatives to traditional pest control methods
- The development of alternative methods that will provide a safer, more cost-effective solution to pest and disease control, and will benefit all people by reducing environmental contamination

## Key Program Components

- 4.1a. Evaluate and develop effective alternative control measures for Japanese Beetle and other potential insect pests in nursery crop production.
- 4.1b. Evaluate and develop effective alternative control measures for plant-parasitic nematodes in nursery production.
- 4.1c. Evaluate and develop environmentally friendly alternatives to fungicides for powdery mildew disease management in dogwood production.
- 4.1d. Investigate the influence of different methods of fertilization and pesticide applications on nutrient and herbicide leaching from production sites of container and field-grown dogwood.
- 4.1e. Investigate the removal of pesticides from non-point source pollution by wood and non-wood fibers.
- 4.1e. Examine the potential of woody crop based streamside buffers in protecting surface water and generating income by sustainable harvesting and selling of round wood produced.

## INTERNAL AND EXTERNAL LINKAGES

- Internal, multi-disciplinary linkages will combine the expertise of research scientists in the fields of entomology, nematology, plant pathology, soil physics, and environmental chemistry, and represent both the main TSU campus and TSU's McMinnville Nursery Crop Research Station.
- External, multi-institutional and multi-disciplinary linkages will involve collaborations with scientists representing USDA-ARS, USDA-APHIS, the Iowa State University, Michigan State University, University of Tennessee, Ohio State University, the nursery crop producers in Tennessee, and the Tennessee Department of Agriculture.



## TARGETED AUDIENCES

- The nursery, turf, landscape, pesticide, and environmental protection and cleanup industries.
- Undergraduate and graduate students.
- Private citizens practicing horticultural pest and disease control and plant maintenance.
- Research and regulatory agencies in state and national government.
- Research and development scientists in university and private industry arenas.

## **Program Duration**

- One to five years

## **Allocated Resources**

- Allocation of resources will be based on the level of funding received from USDA and the State of Tennessee

## **GOAL 5. ENHANCED ECONOMIC OPPORTUNITIES AND QUALITY OF LIFE FOR AMERICANS**

### **PLANNED PROGRAMS**

Program 13. Economic Opportunity

### **STATEMENT OF THE ISSUES**

The nursery crop sector of the green industry is one of the most profitable and important economic sectors in Tennessee. As an agricultural crop, only cotton, soybeans and tobacco surpass nursery crop production in the state. It has been projected that the green industry sales in the United States will grow twice the rate of the general economy in 1999. Conspicuously absent from the overall ownership of this lucrative sector are minorities. A study conducted by Tennessee State University in 1996 found that most minorities in the green industry occupied or had ownership in the less lucrative landscaping or lawn care sector of the industry. It was beyond the scope of the study to determine the reason for this structure.

As minority or limited resource farmers are forced out of farming traditional agronomic crops such as tobacco, they will need viable alternative crops. Hence, we propose to study the constraints to entry into the nursery crop sector by minority or limited resource farmers.

### **Performance Goal 5.1 Assist Minorities to Gain Entrance into the Lucrative Nursery Crop Industry in Tennessee**

#### **Output Indicators**

- Better understanding of the constraints to entry into the nursery crop sector by minority or limited resource farmers
- Refereed scientific publications, exhibits and presentations at scientific meetings, popular press articles, exhibits at trade shows, presentations to industry groups, web sites, field days conducted relative to the objectives of the program
- Number of farmers served
- Enhancement of research capacity

#### **Outcome Indicators**

- New economic information on the nursery crop sector in Tennessee
- Availability of viable alternatives to traditional agronomic crop production
- Enhanced income opportunities for minority or limited resource farmers in Tennessee

## **Key Program Components**

- 5.1a. Investigate factors affecting entry into the nursery industry by minorities in particular, and rural residents in general.

## **Internal and External Linkages**

- Collaborations with other departments at Tennessee State University
- Collaboration with Cooperative Extension at Tennessee State University
- USDA ARS

## **Targeted Audiences**

- Minority and limited resource farmers
- Students
- Researchers
- Public officials

## **Program Duration**

- One to five years

## **Allocated Resources**

- Allocation of resources will be based on the level of funding received from USDA and the State of Tennessee

## STAKEHOLDER INPUT PROCESS

The development of this Plan of Work began with the establishment of the “CARP Vision 2000 Plus” Committee. The committee was established to develop a preferred vision and a corresponding research direction for the Cooperative Agricultural Research Program (CARP) at Tennessee State University. The committee consisted of faculty, scientists (those who conduct research) and staff members. There was also representation from Cooperative Extension (those who use research). This was the first stage of our stakeholder-input process. The second stage consisted of forming research teams. The research teams had the responsibility to insure the relevance of our research direction, or thrust, to the state of Tennessee by seeking inputs from external stakeholders (those who conduct and use research results). The external stakeholders consisted of persons associated with the nursery industry in the state and individuals from many walks of life. Some of these stakeholders are listed in the sections dealing with internal and external linkages.

To insure the relevance of our research programs during the proposed five-year period and beyond, the stakeholder input process will be a continuous one. The process for this will be both formal and informal. The formal process will seek to utilize statewide surveys, townhouse type meetings, and inputs from the “CARP Vision 2000 Plus” Committee. The informal process will take the form of engaging small farmers, commodity and advisory groups, underrepresented groups, students, staff members, and policy makers in dialogues aimed at gathering information or inputs regarding the agricultural issues that concern them the most.

## *SCIENTIFIC PEER/MERIT REVIEW PROCESS*

The process used to select the planned programs was consistent with the Merit Review process for 1890 Evans-Allen research proposals published in the Administrative Manual for Evans-Allen Cooperative Agricultural Research.

FISCAL AND HUMAN RESOURCES ALLOCATED

(Based on FY-99 Data)

GOAL 1: AN AGRICULTURAL PRODUCTION SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

<u>Program</u>	<u>Description</u>	<u>FTE</u>	<u>Budget</u>
Program 1.	Alternative Livestock and Poultry	6.7	\$279,040
Program 2.	Nursery Crop/Green Industry Enhancement	7.6	\$333,157
Program 3.	Small Farms Viability	2.7	\$112,835
Program 4.	Forest Management for Minority Landowners	1.0	\$47,000
<b>Total</b>		<b>18</b>	<b>\$772,032</b>

GOAL 2: A SAFE AND SECURE FOOD AND FIBER SYSTEM

<u>Program</u>	<u>Description</u>	<u>FTE</u>	<u>Budget</u>
Program 5.	Salmonella in Poultry	1.7	\$65,582
Program 6.	Bacteria in Fruits and Vegetables	1.5	\$75,810
<b>Total</b>		<b>3.2</b>	<b>\$141,392</b>

GOAL 3: A HEALTHIER, MORE WELL-NOURISHED POPULATION

<u>Program</u>	<u>Description</u>	<u>FTE</u>	<u>Budget</u>
Program 7.	Nutrition Education for Disadvantaged Populations	1.5	\$55,563
Program 8.	Healthier Eating	1.2	\$46,757
<b>Total</b>		<b>2.7</b>	<b>\$102,320</b>

GOAL 4: GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT

<u>Program</u>	<u>Description</u>	<u>FTE</u>	<u>Budget</u>
Program 9.	Integrated Pest Management	2.0	\$96,816
Program 10.	Sustainable Agriculture	0.7	\$31,856
Program 11.	Water Quality	0.6	\$24,074
Program 12.	Improving Environmental Quality	1.4	\$62,317
<b>Total</b>		<b>4.7</b>	<b>\$215,063</b>

GOAL 5: ENHANCED ECONOMIC OPPORTUNITIES AND QUALITY OF LIFE FOR AMERICANS

<u>Program</u>	<u>Description</u>	<u>FTE</u>	<u>Budget</u>
Program 13.	Economic Opportunity Enhancement	3	\$175,894
<b>Total</b>		<b>3</b>	<b>\$175,894</b>

<u>PROGRAMS</u>	<u>DESCRIPTION</u>	<u>FTE</u>	<u>BUDGET</u>
<b>Grand Total</b>	<b>For all goals</b>	<b>31.6</b>	<b>\$1,406,701</b>

**CERTIFICATION:**

Stephen H. Kolison Jr., Ph.D.

**RESEARCH DIRECTOR**