

# **PLAN OF WORK**

**University of Kentucky**



**College of Agriculture**

**Kentucky Agriculture Experiment Station**

**Lexington, Kentucky**

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**Federal Fiscal Year  
2000-2004**

**C. Oran Little, Dean and Director**



**Plan of Work for the Kentucky Agriculture Experiment Station**

**Introduction:**

This Plan of Work (POW) for the Kentucky Agricultural Experiment Station (KAES) provides descriptions of our four overall program areas and illustrates how these are closely correlated with both Kentucky Cooperative Extension Service (KCES) and CSREES national goals. Experiment station projects form the basic unit from which our Plan of Work is constructed. KAES approved and active projects are identified with key program components in this Plan of Work format. Each program component and project is associated with an element in the matrix of KAES programs and CSREES goals. In our model, planning flows in two directions: 1) the design of individual projects provides shape and specifics for the overall KAES programs and, 2) the KAES, KCES, and national goals/programs provide focus and integration in the development of station projects.

As described in this document, this project-based model also provides a mechanism for documenting peer/merit review and stakeholder input. It is the basis for characterizing the multi-state and multi-function nature of our programs, and provides a means of quantifying allocation of resources in these terms.

The KAES Plan of Work has been developed to provide consistency and integration with a multitude of other planning processes in which we participate. The University of Kentucky has a strategic plan in which each academic unit establishes program priorities. The College as a whole, and each department in the College develops a plan that complements the University's strategic plan and addresses the institution's performance indicators. These plans shape the overall programs and goals of the KAES.

As indicated in this Plan of Work, most of our program components are developed and planned as multi-disciplinary or multi-state. Although it is not completely documented here, programs also rely on extensive collaboration with other in-state universities, particularly our 1890 partner, Kentucky State University (KSU). A number of faculty at KSU hold adjunct professorships within University of Kentucky College of Agriculture (UKCA) research departments.

Operationally, much of the development and implementation of program components occurs at the departmental level. Departments have direct responsibility for research, teaching and extension within their areas. This involves the coordinated activities of research, teaching and extension scientists in fully integrated subject matter areas. Some scientists have split appointments, usually research-teaching and extension-research combinations. Decisions by individual faculty, or teams of faculty, to undertake specific research, teaching and extension projects are based on need, professional specialization, expertise, and availability of funding/resources for the various projects and programs.

**SECTION I**

**Matrix of Planned Programs**

<b>Function</b>	<b>(Competitive Ag)</b>	<b>(Safe food/fiber)</b>	<b>(Health/nutrition)</b>	<b>(Ag-environment)</b>	<b>(Socio-Economic)</b>
CSREES Goals	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
1862 Research Programs	KAES 2	KAES 3	KAES 3	KAES 4	KAES 1
1862 Extension Strategic Goals	KCES 2	KCES 4(a)	KCES 4(b)	KCES 6	KCES 1,3,5
1890 Extension Strategic Goals	KCES 2	KCES 4(a)	KCES 4(b)	KCES 6	KCES 1,3,5

**Kentucky Agricultural Experiment Station Integrated Programs**

To conduct, disseminate and apply integrated, innovative research investigations which will:

- KAES 1      promote economic opportunity and quality of life for Kentucky communities by elucidating critical economic and social issues and their relationships to natural and human resources;
- KAES 2      enhance the competitive position of agricultural producers by promoting the sustainability, productivity, efficiency and diversity of agricultural systems;
- KAES 3      increase the availability of safe, nutritious, affordable foods while advancing our knowledge of human health and nutrition;
- KAES 4      improve environmental quality by developing more effective approaches to the stewardship of natural resources, and by revealing the relationships between management practices and land, air and water.

## Program Descriptions

### **KAES Program 1: Social and Economic Opportunity**

*(CSREES Goal 5)*

To promote economic opportunity and quality of life for Kentucky communities by elucidating critical economic and social issues and their relationships to natural and human resources.

#### Statement of the Issue to be Addressed

*with KCES POW)*

*(Common, in part,*

That some sectors of the Kentucky population have severe economic problems is widely recognized. These economic problems and conditions impact every aspect of the population and life in the Commonwealth, especially Kentucky's children. Below are listed some telling indicators of economic, social and community conditions in Kentucky:

- Less than 70% of Kentucky first graders complete high school.
- Kentucky ranks 4<sup>th</sup> in the number of farms (91,000 in 1997).
- Quota cuts will reduce 1999 income by more than \$200,000,000 for Kentucky's estimated 60,000 tobacco producers and quota holders.
- Kentucky ranks 47<sup>th</sup> in school spending (\$1,225 per capita in 1995).
- Ranks 40<sup>th</sup> in personal income (\$20,599 in per capital income in 1997).
- Ranks 12<sup>th</sup> in poverty rate (15.9% of Kentucky's population in 1997).
- Ranks 43<sup>rd</sup> out of 50 states in the number of households with a computer (30.3% in 1997).

Relative to much of the nation, Kentucky maintains a larger fraction of the population in rural areas and a high percentage of the population engaged in farming. Global and local changes in agricultural systems, including consolidation of agricultural production operations and agribusiness, plus the widespread expectation of dramatic shifts in tobacco farming, are having and will continue to have substantial impact on rural economies. While urban areas of Kentucky currently have low unemployment, historical high unemployment and underemployment plague rural areas of the state. To combat these economic conditions and the associated social and community problems, KCES and KAES are conducting educational and research programs to enhance economic opportunities and quality of life among Kentucky's families and communities.

Many Kentuckians lack the educational preparation and skills needed to secure and maintain employment. With industries relocating in other parts of the country or in other countries, industry closings have greatly impacted many areas of the state. Passage of the Workforce Investment Act in 1998 has changed the way workforce related government agencies will do business in the future. Throughout life, Kentuckians (youth and adults) need to develop skills which lead toward becoming productive and contributing members of the workforce.

Youth need to be involved as active citizens at an early age. UKCA youth programs, including 4-H, will continue to be a cornerstone of efforts in this program area.

Research is required to develop tools to facilitate long-term comprehensive planning, to educate and empower the public and to encourage communication and cooperation between public and private groups. As communities in rural areas respond to the pressures of changing economic conditions, the KAES and KCES must provide tools to state and local leaders for assessing natural and human resources, for analyzing development options, and for understanding and responding to the consequences of social and economic change.

#### Performance Goal

Our goal is to discover, develop and deliver scientific information, analysis and educational programming which promotes economic opportunities and enhanced quality of life for Kentucky communities.

#### Output Indicators

1. Improved databases and analyses of demographic and community trends and changes.
2. Increased and improved information on economic opportunity and development for Kentucky communities.
3. Integration of social, economic and technical analyses as related to agriculture, food and natural resource issues in our region and the nation.
4. Development of publications, educational materials, and other material to document and extend research findings.

#### Outcome Indicators

1. Number of rural and low-income youth participating in educational or personal development programs through UKCA.
2. Number of communities utilizing enhanced planning and development systems and programs in cooperation with UKCA.

#### Key Program Components

A complete listing of key program components is provided in **Tables 1 and 2**. These tables also characterize components with regard to allocation of resources, multi-state and multi-function nature.

#### Internal and External Linkages

Internal linkages among KCES, KAES and the instructional/academic mission of our College have been, and will continue to be fully developed. Through our partnership with Extension, KAES shares planning, information and programming with county agents and local stakeholders throughout Kentucky. Externally, our research scientists interact with other research institutions through the formally documented multistate program components identified in this POW. In addition, extensive linkages are maintained among research scientists at universities, and other public and private research facilities throughout the world through collaborative research, exchange of research materials, scientific meetings and workshops, and (of ever-increasing importance) informal electronic communication. These linkages are far too numerous and unstructured to document here.

#### Target Audiences

Target audiences for all KAES programs are diverse and intentionally non-constrained. Our primary mission continues to be service to the people of Kentucky. The expertise, tradition and program priorities of KAES lead to an emphasis on audiences concerned with issues of agricultural production, food, natural resources, and rural communities. However as our programs and societal concerns co-evolve, we find a broadening audience in areas such as urban planning, economic and industrial development, youth at risk, and health care. In

partnership with KSU, we continue to reach out to a diverse audience including small farmers, minorities and non-traditional clientele. In cooperation with KCES and our academic instructional programs we have made substantial progress in building an inclusive community of teaching and learning. Finally, as researchers we find an audience in all those, young and old, who share a passion for discovery in the life sciences.

Program Duration

This program will be of intermediate duration, based on projects of approximately 5 years.

Allocated Resources

Projected annual allocation of resources is based on initial budget estimates by program component for FY 98-99. Projected allocation of resources through 2004, assumes a 3% annual increase in total resource availability for KAES programs, and tentatively assumes no substantial reallocation among program areas.

	<b>Federal (\$1000)</b>	<b>State (\$1000)</b>	<b>Total (\$1000)</b>	<b>SY</b>
Total Program 1	171	348	520	3.8
Multi-state components	90	198	288	2.4
Multi-function components	46	218	264	2.2

## **KAES Program 2: Competitive Agriculture**

*(CSREES Goal 1)*

To conduct research and education which will enhance the competitive position of agricultural producers by promoting the productivity, efficiency, diversity and sustainability of agricultural systems.

### Statement of the Issue to be Addressed

*(Common with KCES POW)*

Growth in the farm-gate value of commodities in Kentucky has approximately paralleled that of growth observed within the U.S. agricultural sector as a whole. The farm value of U.S. consumer food purchases has grown by about 25% over the past 10 years. This growth has barely kept pace with inflation and is less than half of the growth rate observed in the value added to these commodity products through value-adding activities. The marketing bill, which includes processing, packaging, distribution, storing, merchandising, and other value-adding activities has grown by 55% over this period.

The situation in Kentucky reflects slow growth for commodity farm-gate values and the value added beyond the farm. Cash receipts to farmers for livestock products in Kentucky have moved between \$1.5 and \$1.7 billion for the last 10 years. Crop receipts have increased during this period, but most of the growth has come from tobacco, which is facing an uncertain future. Efforts to enhance farm incomes in the state will be advanced as programs help farmers become more competitive producers of commodity products, and also to materially participate in the faster growing value-added activities beyond the farm gate.

The approximately 77,000 farms in the state average less than 150 acres per operation. Many of these farms are major producers of traditional agricultural commodities, such as livestock, tobacco, and grain. Others are operated either on a part-time basis or involve limited resources. Many rural counties remain significantly dependent on farm income for their economic viability. The successful development of new agricultural enterprises that fit the diversification needs of many of these producers (particularly tobacco) create new opportunities for these communities to enhance their income base while managing some of the increasing risk exposure attending farming in connection with the FAIR legislation of 1996. Successful risk management will play favorably into the relative competitiveness of the state's agricultural economy.

Value-added opportunities in agriculture create jobs; many of these within rural agricultural communities. It creates expanded demand for local agricultural products. These initiatives often require encouraging local entrepreneurial creativity and risk taking as well as building a network of support resources to enhance chances for their successful development. States such as North Dakota, Iowa, and Minnesota have made substantial resource commitments to support value-adding innovations that utilize local agricultural products. Kentucky has also made steps toward this end. The Kentucky Department of Agriculture has created three new value-added divisions for livestock, horticulture, and secondary wood products. The strategy is to enhance the competitiveness and scope of marketing opportunities for local farmers as these sectors are better developed.

KAES and KCES are in a unique position to develop programming in support of these efforts throughout Kentucky. Producers typically approach county offices seeking help as they are considering new business ideas for their farm. The network of county offices in the state is supported by the UKCA human and technical resources that can train, disseminate current product and market information, and initiate research activities that can help local producers translate good business ideas into good businesses. KAES and KCES collaborate with a variety of internal and external partners to help build entrepreneurial capacity locally that moves the agricultural economy toward a more competitive system.

Performance Goal

Our goal is to discover, develop and deliver scientific information, analysis and educational programming which will enhance the competitive position of agricultural producers by promoting the productivity, efficiency, diversity and sustainability of agricultural systems. The output indicators below are specific for KAES; the outcome indicators are shared with our Cooperative Extension partners.

Output Indicators

1. Improved plant and animal genotypes, applications of biotechnology (in the broadest sense) for the benefit of farmers and food producers and consumers.
2. Advanced technology for application to production systems of all sizes and for diverse commodities.
3. Enhanced, more efficient management systems for diversified agricultural opportunities.
4. Integration of economic and technical analyses as related to agricultural production systems in our region and the nation.
5. Development of publications, educational materials, and other material to document and extend research findings.

Outcome Indicators (Common with KCES POW)

1. Number of producers utilizing new marketing opportunities.
2. Number of farmers adopting one or more practices resulting in increased profits.
3. Economic impact of practice changes reported immediately above.
4. Number of producers adopting resource management technologies (IRM, IPM, soil testing, soil fertility management).
5. Number of individuals reporting changes in knowledge, opinions, skills, or aspirations related to the impact of public policies on agriculture and the environment.

Key Program Components

**See Tables 1 and 2.**

Internal and External Linkages

Target Audiences

Program Duration

**Refer to Program 1 description.**

Allocated Resources

Projected annual allocation of resources is based on initial budget estimates by program component for FY 98-99. Projected allocation of resources through 2004, assumes a 3% annual increase in total resource availability for KAES programs, and tentatively assumes no substantial reallocation among program areas.

	<b>Federal (\$1000)</b>	<b>State (\$1000)</b>	<b>Total (\$1000)</b>	<b>SY</b>
Total Program 2	2,070	5,264	7,334	51.3
Multi-state components	820	2,234	3,054	21.2
Multi-function components	546	1,353	1,898	11.4



### **KAES Program 3: Safe Food and Fiber**

*(CSREES Goals 2 and 3)*

To increase the availability of safe, nutritious, affordable foods while advancing our knowledge of human health and nutrition.

#### Statement of the Issue to be Addressed

*(Shared in part with KCES POW)*

Although there is general agreement among Americans on the need for safe food, there is no consensus on how to secure safe food. For a food supply system to be effective it should focus on and integrate the varied needs and responsibilities of all stakeholders. Safe food is defined as wholesome, within an acceptable level of risk associated with pathogenic organisms or chemical and physical hazards. Safe food supply is the result of the combined activities of all concerned government agencies, educational facilities, private industries and consumers. The Committee to Ensure Safe Food from Production to Consumption (1999) states, "The mission of an effective food safety system is to protect and improve the public health by ensuring that foods meet science-based safety standards through the integrated activities of the public and private sectors."

Changes in the risk of foodborne disease are due primarily to changes in diet; increasing use of commercial food service and in food eaten or prepared away from home; new methods of producing and distributing food; new or re-emerging foodborne pathogens; and the growing number of at-risk individuals, such as the elderly and immuno-compromised. Chemical hazards associated with the food supply are also changing due to the increased use of dietary and herbal supplements that have no required safety standards; new food components that mimic attributes of traditional food components; introduction of new food technologies and processes; and changes in presence of food toxins and additives.

The incidence of foodborne illness is increasing in the United States. Although estimates as high as 84 million cases of foodborne illness per year have been suggested, many cases go undetected because the consumer is unaware that many intestinal upsets are caused by foodborne pathogens or their toxins. The annual cost of foodborne illness to the American economy is estimated at over \$10 billion.

Over 50% of all foodborne illness can be attributed to mistakes made in foodservice establishments and restaurants, while 20% are traceable to consumers in their own home. The National Restaurant Association estimates that up to 57% of all meals may be consumed away from home. This includes the elderly and school-age children, who are at greater risk of being susceptible to foodborne pathogens. Careless food handling habits may be more common among the elderly and children, increasing the hazards of pathogenic bacteria.

Educational training on the safe preparation and handling of food for at-risk groups and other consumers would be the best methods of decreasing the risks of foodborne illness. The most critical concepts of food safety include personal hygiene, with an emphasis on hand washing; preventing cross-contamination; cooking food thoroughly by paying particular attention to time and temperature; and refrigerating food promptly.

In addition, educational training can enhance the safety of our food supply by improving production and processing practices. Hands-on training in developing and implementing Hazard Analysis Critical Control Point (HACCP) plans will be an invaluable tool for Kentucky processors. HACCP can be applied to home and restaurant kitchens as well.

Increased introduction of plant and animal pest arthropods and pathogenic organisms and failures of management tactics and evolution of species require a constant vigil to assure adequate production of food and fiber. Pest arthropods and plant pathogens can rapidly develop resistance to chemicals employed in management or new strains and races can emerge rapidly, in part, due to the consequence of different production practices and potentially as a result of regional or global environmental changes. Also, the excessive use of chemical management tactics and subsequent discoveries of persistence and hazards of residues have threatened the safety of our food supply.

Dietary habits can influence the risk of developing chronic diseases and our ability to control them. Three of the leading causes of morbidity and mortality in Kentucky are cardiovascular disease, cancer and diabetes. These chronic diseases have strong nutrition and physical activity components in the recommendations for their prevention and treatment. A recent report, *Years of Healthy Life-Selected States, U.S. 1993-1995*, assessed an index of health-related quality of life in 16 states (Centers for Disease Control and Prevention, 1998). Kentucky was among those states, and was ranked lowest of the 16 on a "health-related quality of life index". This index varied directly with life expectancy, with Kentuckians having fewer years of healthy life at ages 25 and 65 than the residents of the other 15 states.

The KAES contributes to CSREES Goals 2 and 3 through the collaboration of researchers, educators and Extension specialists from various disciplines working towards the safety, quality and necessary quantity of food for all people. This effort involves food producers, processors, marketing persons, consumers and anyone involved with the chain events in food production.

#### Performance Goal

Our goal is to discover, develop and deliver scientific information, analysis and educational programming which will increase the availability of safe, nutritious, affordable foods while advancing our knowledge of human health and nutrition. The output indicators below are specific for KAES; the outcome indicators are shared with our KCES partners.

#### Output Indicators

1. New and improved technology for processing and production of foods in Kentucky.
2. Analyses and improved understanding of nutritional practices and constraints as related to social, economic and technological trends.
3. Improved methods of preventing and detecting food-borne illnesses and food contamination.
4. Development of publications, educational materials, and other material to document and extend research findings.

#### Outcome Indicators

*(Shared in part with KCES POW)*

1. Number of individuals adopting practices that ensure safe handling of food.
2. Number of individuals adopting safe practices concerning herbal and vitamin supplementation.
3. Number of processors (meat, vegetable or fruit) developing HACCP plans.
4. Number of individuals who experience a change in knowledge, opinions, skills, or aspirations regarding lifestyle changes (diet, physical activity, etc.) that improve personal health.

Key Program Components  
**See Tables 1 and 2.**

Internal and External Linkages

Target Audiences

Program Duration

**Refer to Program 1 description.**

Allocated Resources

Projected annual allocation of resources is based on initial budget estimates by program component for FY 98-99. Projected allocation of resources through 2004, assumes a 3% annual increase in total resource availability for KAES programs, and tentatively assumes no substantial reallocation among program areas.

	<b>Federal</b>	<b>State</b>	<b>Total</b>	<b>SY</b>
	<b>(\$1000)</b>	<b>(\$1000)</b>	<b>(\$1000)</b>	
Total Program 3	451	942	1,393	10.9
Multi-state components	317	368	685	5.0
Multi-function components	213	270	483	3.8

## **KAES Program 4: Agriculture and Environmental Quality**

*(CSREES Goal 4)*

To improve environmental quality by developing more effective approaches to the stewardship of natural resources, and by revealing the relationships between management practices and land, air and water.

### Statement of the Issue to be Addressed

*(Common with KCES POW)*

Kentucky's natural biological wealth and beauty has drawn the attention of people for centuries. More than 3,000 vascular plant, 230 fish, 103 mussel, 105 amphibian and reptile, 350 bird, 75 mammal, and 12,000 insect species call Kentucky home. Of this number, 11% of the plants, 36% of the freshwater bivalves, 31% of the fishes, 23% of the reptiles and amphibians, 15% of the birds, and 33% of the mammals are listed as rare, threatened or endangered.

Kentucky is home to eleven rare ecological communities, two of which are globally rare. The bluegrass savanna, unique to central Kentucky, is now extinct and more than 80% of the state's wetlands have been destroyed. More than 2 million acres of tall grass prairies and barrens have been reduced to less than 200 acres in scattered remnants.

While Kentucky's forests are floristically and faunistically diverse, they are in various conditions of quality and less than 3,000 acres of old growth forests are currently found in the Commonwealth. Overall, less than 1% of Kentucky is classified ecologically in a "pre-European" condition. Kentucky's biological wealth may continue to be threatened in the future unless comprehensive and sustainable approaches are utilized for harvesting the fruits of the land through logging, mining, and agricultural production.

Concern over forest ecosystem issues by the general public and the forest products industry has generated both national and state recognition of the need for educational programs targeting timber harvesting professionals. Recent survey data indicate only 16% of the timber harvesting operations in Kentucky are being completed with the assistance of resource professionals, and only 28% are being completed with the proper implementation of Best Management Practices for water quality protection. In addition to timber harvesting activity, much of this same land is impacted by coal production. An average of 16,000 acres of land per year since 1975 is impacted by mining activity concentrated in Kentucky's primary forest producing areas.

Many Kentucky farms are located on highly erodible land or near water sources. In 1988, the only information of the impact of agriculture on the water resources in Kentucky was found in the biennial 305B Kentucky Report to Congress on Water Quality. In those reports, agriculture was listed as a significant contaminant source for nearly 25% of the assessed Kentucky streams and lakes not meeting designated use criteria.

Runoff pollution, also known as nonpoint source pollution, is the number one contributor to water pollution in Kentucky. Runoff pollution is caused by numerous activities such as mining, farming, logging and construction. Nonpoint source pollution can also come from activities around the home such as using lawn care products, dumping used motor oil, anti-freeze and other chemicals into ditches or down storm drains and improperly treating household waste water.

Most soils in Kentucky are deficient in one or more of the major nutrients required for sustainable crop production: many are too acid, some are deficient in certain micronutrients, and some have adequate to excessive levels of all these. In most cases, there is great variability among fields on individual farms. Since

the native content of soil nitrogen (N) is insufficient for sustainable production of corn, tobacco, and small grains in most Kentucky soils, use of supplemental N from fertilizers or animal manures is necessary. Without use of some kinds and amounts of fertilizers, crop yields from most soils in Kentucky would be non-sustainable.

Environmental and natural resources issues will continue to be critical components of research programs of the KAES. The station will focus on natural resource utilization and economic development, integrated pest management and precision agricultural practices, and relationships among environmental factors and quality of life. Concerns for potential degradation of soil and water resources provide an increasing urgency for research on sustainable land management practices. Coordinated research programs in soil and forest management, ecosystems analysis, plant ecology, watershed management, restoration ecology, and wildlife management are all part of the efforts to achieve the goal of harmony with the environment.

#### Performance Goal

Our goal is to discover, develop and deliver scientific information, analysis and educational programming which improves environmental quality by developing more effective approaches to the stewardship of natural resources, particularly as related to the management of land, air and water. The output indicators below are specific for KAES; the outcome indicators are shared with our Cooperative Extension partners.

#### Output Indicators

1. Improved databases and analyses regarding quality of land and water resources in Kentucky.
2. New and enhanced technology and management systems for minimizing adverse environmental impacts associated with production of animals and plants.
3. Better understanding of the functioning and interrelationships of Kentucky ecosystems.
4. Integration of social, economic and technical analyses as related to agriculture and natural resource issues in our region and the nation.
5. Development of publications, educational materials, and other material to document and extend research findings.

#### Outcome Indicators (*common with KCES POW*)

1. Number of individuals adopting practices that ensure safe water.
2. Number of individuals using forest management practices.
3. Number of acres upon which new or additional conservation practices are used.
4. Number of individuals adopting one or more practices related to conserving, sustaining, and/or protecting soil resources.

#### Key Program Components

**See Tables 1 and 2.**

#### Internal and External Linkages

##### Target Audiences

##### Program Duration

**Refer to Program 1 description.**

#### Allocated Resources

Projected annual allocation of resources is based on initial budget estimates by program component for FY 98-99. Projected allocation of resources through 2004, assumes a 3% annual increase in total resource availability for KAES programs, and tentatively assumes no substantial reallocation among program areas.

	<b>Federal (\$1000)</b>	<b>State (\$1000)</b>	<b>Total (\$1000)</b>	<b>SY</b>
Total Program 4	1,342	2,340	3,682	30.3
Multi-state components	606	981	1,588	11.4
Multi-function components	707	1,016	1,723	13.0

## **SECTION II**

### **Stakeholder Input Process**

#### **A. The Kentucky Agricultural Advancement Council**

Within the state of Kentucky, the land-grant universities have adopted a cooperative, comprehensive, multi-functional strategy for receiving stakeholder input. We have developed a stakeholder advisory process which provides timely and continuing guidance on issues important to our citizen base. The revised process brings together several traditional and non-traditional advisory groups in a rotational system for more effective planning, priority setting, programming and evaluation. In 1999, a cooperative effort between the 1) Kentucky Agriculture Advancement Council (KAAC), 2) UKCA, 3) KCES, 4) KAES, and 5) KSU was utilized.

Agricultural advisory councils had been used in counties for many years to help direct educational programs. The professional organization of County Extension Agents for Agriculture and Natural Resources requested that a system of area councils be developed to direct concerns to a state level council. In 1995 a series of five regional agriculture issues conferences were sponsored by UKCA, KSU and Kentucky Leadership Agricultural and Environmental Sustainability (KLAES), a project group that was partially funded by the Kellogg Foundation and the USDA Sustainable Agriculture Research and Education Program (SARE). The intent of the regional conferences was to gain an understanding of the barriers to sustainable agriculture and to help the land-grant institutions and state government develop strategic plans to advance agriculture that included profitable farms and a healthy environment.

In initial discussions a system was developed around 15 areas (14 KCES areas and one of KSU constituents) to gather concerns at the area level. These concerns were those that could not be solved at the county level, or were of common interest in most of the counties. Delegate (council) meetings were (and will be) held to bring concerns that deserve state-wide attention. The Council consists of 45 people; two clients plus one agent from each area. A rotation of members is prescribed to keep the council dynamic in its make-up. Advice is not limited to the traditional land-grant programs; but provides a forum to identify issues important to programming decisions for the food and agricultural science in the broadest context (rural, urban, and suburban). This council was named the Kentucky Agricultural Advancement Council.

The KAAC meets at least twice annually for the following purposes:

- To provide leadership to the UKCA Cooperative Extension Service, Research, and Instruction Programs and KSU Land Grant Programs;
- To provide a mode of communication between the UKCA and KSU Land Grant Programs of the issues and needs of Kentucky's agriculture industry;
- To assist in the identification, coordination, prioritization and advancement of agriculture development initiatives among all segments of the agriculture industry and citizens.

The output from and early KAAC meeting held in March, 1999 was a comprehensive set of recommendations framed under a 1999 action plan which is attached to this POW.

## **B. Additional avenues for stakeholder input**

1. Individual program reviews: All academic departments are periodically reviewed. Instructional, research and extension programs are evaluated. Review panels include at least one member external to the College and Experiment Station who is a stakeholder. A critical component of every review is solicitation of comment, evaluation and suggestions from clientele or stakeholders. The specific mechanism is determined by the review committee, but may include surveys or collection of input at the county level by Extension agents.
2. Advisory boards for specific projects: Many individual projects or program areas have established an advisory body or incorporated stakeholder advisors in their normal planning operations. Illustrative examples include the collaborative partnerships between the Department of Horticulture and the Kentucky Horticultural Council; the UK Wheat Science Group and the Kentucky Small Grain Growers Association; and the Precision Agriculture Advisory Board which will provide guidance for our Research/Extension team recently funded by a USDA Special Grant.
3. Participation in Kentucky's agricultural, commodity and rural community leadership organizations: Much of the agenda for Kentucky's efforts in agricultural and rural development is formed by the various traditional and non-traditional leadership organizations, including commodity groups, rural development and farm organizations. The KAES is well represented in these groups, participates in planning and deliberations, and actively encourages discussion of how the Research/Extension missions can be coordinated with the state-wide comprehensive agenda. During the 1990's, "Ag Project 2000" provided a unified plan for Kentucky agricultural and rural development. This planning and prioritization initiative represented an unprecedented collaboration of public agencies, farm organizations and all significant agricultural commodity groups. The initiative was coordinated by the Kentucky Farm Bureau and UKCA.



## SECTION III

### Program Review Process

#### A. Project-based review

The KAES focuses scientific peer review, almost entirely, and merit review, in part, on individual research projects. During 1999-2000, we will be re-evaluating our project proposal review process to more fully address AREERA objectives and to enhance research planning.

We interpret scientific peer review to mean evaluation by other researchers who possess the expertise required to conduct the same or similar research. Such review would include evaluation of the technical feasibility, the originality and the scientific/disciplinary significance of the research work. Recognizing that: 1) all productive research programs are subjected to extensive peer review through submission of publications and competitive grant proposals, 2) that an Experiment Station is generally not able and should not attempt to control these processes, and 3) that the research project proposal is usually the basic unit of research planning, KAES emphasizes peer (and merit) review during the development of Experiment Station research projects.

When KAES project proposals are submitted by an individual PI or a team of investigators, the academic department of the lead PI assumes responsibility for the initial stage of peer review. Although the process varies somewhat among academic units, a Project Review Committee Chair is generally charged with obtaining anonymous peer review. In many cases the required reviewer expertise will exist within the department or elsewhere in the university. If satisfactory expertise is not available, external reviews are solicited. After multiple reviews (usually three) are collected, a Project Review Committee will recommend approval, rejection or revision. Only approved projects are forwarded for further review at the College level. A College Review Committee conducts further scientific peer review of Station projects, to include anonymous *ad hoc* review by highly qualified individuals, as well as review by a designated Station statistician and other appropriate faculty.

Merit review is also an integral element of the project review process. Merit review of a project includes consideration of its potential impact, its relevance to stakeholders, and its appropriateness within the mission of the KAES. The project development and review process allows evaluation and input on merit from both faculty peers and administration.

#### B. Program Review

Periodic program reviews are mandated by the Commonwealth of Kentucky. Departments, degree-granting programs, research centers and colleges are subject to periodic review. Although most of the state-prescribed elements of program review emphasize academic and instructional programs, the UKCA has gone beyond these requirements to integrate review of academic, research and extension functions. The entire program review process typically includes an internal self-study, collection and analysis of performance data as related to established strategic indicators, the review itself, and the review response and follow-up phase. Review teams for units in the UKCA include stakeholders as well as faculty staff and students. Mandated periodic program reviews in the past have frequently been coordinated with USDA-led reviews, conducted by external scientists. More recently, USDA program reviews are becoming less common.

Program reviews can provide a most valuable merit review of research and extension functions. Evaluation of impact and significance is derived from stakeholder participation in the review teams, and in most cases from surveys or extensive polling of clientele, extension field staff, and other external agencies or individuals which interact with the program.

## SECTION IV

### Multistate Research and Extension Activities

We have quantified and documented multistate research activities within the context of our Hatch and KAES project portfolio. Our classification is likely to underestimate the extent of multistate integration of programs by excluding cooperative projects which are based on non-contractual or informally documented collaborations among researchers. However, we have chosen to classify a project as multi-state if:

1. It was established under the former Hatch Regional Research Program, or continues to operate under Hatch Multistate Research Funds, or
2. It is directly tied to, or in large part shares common objectives with an established Southern Region Information Exchange Group or other IEG, or
3. It is substantially a part of a documented multistate cooperative project (e.g., Our KAES project “Somatic Cell Genetics of Crop Plants” shares common objectives with an extramurally funded, 4-state consortium studying soybean transformation; the research Memorandum of Agreement providing documentation of the multistate nature of the program.)

Refer to **Table 1** for identification of all multistate program components, by KAES program. For all programs, the baseline allocation of resources to multistate activities is:

	<b>Federal (\$1000)</b>	<b>State (\$1000)</b>	<b>Total (\$1000)</b>	<b>SY</b>
Total, all KAES Programs	4,030	8,894	12,924	96.3
Multi-state components	1,833	3,781	5,614	40.0
Percent of total	<b>45.4%</b>	42.5%	43.4%	41.5%

## SECTION V

### Integrated Research and Extension Activities

Research and Extension functions have been, and will continue to be, integrated to a unique extent in the Kentucky system. The Dean of the UKCA formally serves as Director of both the KAES and the KCES. The two Associate Directors assigned responsibility for direction of Extension and Research are housed in the same office suite. Extension and Research/Teaching faculty hold appointments, and their programming is coordinated within the same subject matter departments. Commonly, individuals hold split Extension-Research appointments, but more importantly, Extension faculty are generally expected to conduct applied collaborative research, and Research faculty are required to participate in Extension and other outreach/service activities.

While the design and implementation of our Research-Extension structure epitomizes the AREERA mandate for multifunction integration, it ironically has created limitations in quantifying and documenting such integration. To promote integration of Research and Extension we have deliberately minimized institutional differentiation of these activities at the level of the individual project or scientist. At the organizational level, this makes differentiation of discrete research, extension and integrated projects or programs less meaningful. With the possible exception of some single-investigator, very fundamental research projects, virtually all of our project portfolio includes collaboration with Extension personnel, interaction with producers or other clientele, and strong elements of technology transfer or outreach. However, in this, our initial POW, we have chosen to apply much more restrictive, but more easily quantifiable, criteria to identify multifunction projects and programs: A research project was classified as multifunction if:

1. A faculty member holding a % Distribution of Effort appointment in Extension is listed as a PI, co-PI or Collaborator on the project, (our % DOE represents a quasi-contractual system for monitoring faculty workload and assignment), or
2. The project objectives directly address a substantial and continuing extension or outreach activity (e.g., variety testing projects which annually publish results and conduct educational programming), or
3. The project falls within the scope of one of the College's formally established initiatives which integrate Research and Extension programming (e.g., the UK Wheat Science Group, our Food Quality/Safety Task Force, our Beef Integrated Resource Management Team).

Refer to **Table 1** for identification of all multi-function program components, by KAES program. For all programs, the baseline allocation of resources to multistate activities is:

	<b>Federal (\$1000)</b>	<b>State (\$1000)</b>	<b>Total (\$1000)</b>	<b>SY</b>
Total, all KAES programs	4,030	8,894	12,924	96.3
Multi-function components	1,512	2,857	4,368	30.2
Percent of total	<b>37.5%</b>	32.1%	33.8%	31.3%

## Attachment to Section II

### Kentucky Agricultural Advancement Council 1999 Action Plan

#### PUBLIC RELATIONS/POLICY

- Develop programs that assist agricultural groups in identifying and utilizing media resources.
- Identify and actively promote the use of meaningful county or area programs that positively promote agriculture and may be adapted for statewide and/or multi-state use.
- Assemble facts and provide resources that can impact public perception regarding farmer's share of the food dollar. Continue to provide similar information regarding other timely issues as identified by the KAAC.
- Provide guidance to policy makers and citizens to value investments in research and Extension.

#### LIVESTOCK PRODUCTION

- Agents & Specialists show clientele, through demonstrations, statistics and market information about cattle breeds and develop strategies to improve production in response to consumer demands.
- Continue to utilize and expand grazing school programs to reach more of the cattle producing areas.
- Make available to all agents the training & resource material on grazing so they can do day-to-day teaching and programs. More newsletters, media material sent to agents.
- Do more cost analysis, dollars and cents, trials, demonstrations, etc.
- Request more detailed and more accurate feed tag information from UK Regulatory Services. Is there a need for State Government Policy change?
- Continue and increase research, demonstrations & Extension work on hay storage, wrapping management & harvesting, and plastic disposal.
- Develop a working beef management guide that agents could use one-on-one to work with producers. Make sure it's something that will be a self-learning tool for the farmer that he can do individually and assess his own situation.
- Continue business management education that is integrated with production through beef production/management meetings, field days, etc.
- Compile data and information and extend this information to agents and producers via market analysis, multi-county groups, relative to the effectiveness of special sales.

- Explore market options using the existing market structure through new techniques, programs on hedging futures, etc. in layman's terms .
- Continue to provide technical support for swine marketing groups and programs.
- Explore local marketing opportunities for small producers for alternative species. i.e., potential for upgrading slaughter plants lockers, for direct marketing. Source of information might be from other states.
- Expand media program to encourage more producers to complete Water Quality Plans.
- Provide sample service at UKCA Princeton Research and Education Center on Nutrient Management. Recommendations to be based on analysis from Extension Specialist.

### CROP PRODUCTION

- Help identify new and existing value-added opportunities for existing crops and other markets.
- Provide education to both clientele and agents for developing production/ marketing strategies.
- Relay more information on value-added and existing commodities. Put higher priorities on solving this problem and on additional agent training and agent specialization.
- Continue the emphasis on nutrient management plans that impact water quality and nutrient management research and water quality planning.
- Work to improve the public perception about agriculture.
- Continue multi-disciplinary emphasis on precision agriculture in Extension programming, on biotech and genetically engineered crops as well as traditional commodities.
- Continue tobacco disease research.
- Identify opportunities that encourage multi-state/regional efforts toward addressing common problems (i.e., Black Shank, Management Training, Dairy Production).

### ECONOMIC DEVELOPMENT

- Influence policy decisions that positively impact former and current tobacco producers and protect KY economic base associated with agriculture.
- Develop estate planning strategies to retain land base associated with agriculture.
- Timber and recreational use strategies.

- Decision tools for efficient management of agricultural and small business enterprises. Value advances related to investments in biotechnology.
- Establish a specialist's position to help producers overcome obstacles of H2A regulations and to help ease the language barrier problem with publication and fact-sheets in Spanish. Time: Immediately

#### REGIONAL CONCERNS

- Develop and value new strategies for multiple use of lands.



## **Attachments to Plan of Work**

KAAC 1999 Action Plan

Table 1, Key Program Components

Table 2, Key Program Components

**Kentucky Agriculture Experiment Station  
University of Kentucky  
College of Agriculture  
Lexington, Kentucky**

**Table 1: Multi-state and Multi-function Nature of Key Program Components**

**KAES Program 1:** To promote economic opportunity and quality of life for Kentucky communities by elucidating critical economic and social issues and their relationships to natural and human resources, is equivalent to CSREES Goal 5.

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY004005	Analyzing impacts of structure of U.S. agriculture on structure of non-farm rural communities	1	N	N
KY004006	Rural economic development: alternatives in the new competitive environment	1	Y	N
KY004008	Financing agriculture and rural America: issues of policy, structure and technical change	1	Y	Y
KY011003	Comprehensive Land Use Planning for Sustainable Rural Development Using Expert Systems	1	N	Y
KY013003	Rural Low-income Families: Monitoring Their Functioning in the Context of Welfare Reform	1	Y	Y

**Table 1, KAES program 2(continued)**

**Table 1 Continued: Multi-state and Multi-function Nature of Key Program Components**

**KAES program 2.** To enhance the competitive position of agricultural producers and diversity of agricultural systems, is equivalent to CSREES goal 1.

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY00066	Somatic cell genetics of crop plants	2	Y	N
KY00098	Analyzing the future international competitiveness of the US food industry	2	N	N
KY00220	Evaluation of burley tobacco	2	Y	N
KY003349	Administered to Racehorses Pharmacology and Development and Application of Chemical	2	N	Y
KY004001	An evaluation of international markets for southern commodities	2	Y	N
KY004002	Evaluation of public policy alternatives designed to help U.S. cash crop farmers manage risk	2	Y	N
KY004010	Impacts of trade agreements and economic policies on southern agriculture	2	Y	N
KY005001	Interior environment and energy use in poultry and livestock facilities	2	Y	Y
KY005002	Mechanics of Granular Solids	2	N	N
KY005003	Fiber optic Sensor development for cottage cheese processing	2	N	Y
KY005007	A systematic approach to enzyme recovery from solid state fermentation	2	N	N
KY00591	Interaction between Ethylene and polyamines during seed germination and early seedling growth	2	N	N

**Table 1, KAES program 2(continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY00593	Antimicrobial properties of naturally occurring volatile compounds from plants	2	N	N
KY00594	Evaluation of Cut Flower Species for Adaptability to Improved Greenhouse Production Practices and Extended Postharvest Life	2	N	Y
KY006003	Understanding Recombination and Modifying its Frequency in Soybean and Corn	2	N	N
KY006004	Multiplicative (Linear-Bilinear) Models for Genotype X Environment Interaction in Crop Cultivar	2	N	N
KY006006	The Relationship Between Photosynthesis, Assimilate Supply and the Size of the Reproductive Sink	2	N	N
KY006007	Determining Application Rates of Several Nutrient Sources for Optimum Production and Soil	2	N	Y
KY006008	Evaluation of Soybean Varieties and Breeding Lines for use in Kentucky	2	N	Y
KY006009	Early Maturing Soybean Cropping System: Identifying Appropriate Cultivars	2	N	N
KY006010	The Role of Ammonium-Potassium-Calcium Exchange in Regulating Nitrification rates in Soil	2	N	N
KY006012	Manipulation and Regulation of Oxylinin Formation in Plant Tissues	2	N	N
KY006013	Analysis of mRNA Polyadenylation and Metabolism in Plants	2	N	N

**Table 1, KAES program 2(continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY006014	Significance of Loline Alkaloids in Ecosystems Predominated by Grass/Endophyte Associations	2	N	N
KY006015	Studies and Efforts to Engineer the Metabolism in Plant Trichomes	2	N	N
KY006016	Forage Crop genetics and Breeding to Improve Yield and Quality	2	Y	N
KY006017	Amount and Quality of Herbage Ingested by Cattle Grazing Tall Fescue Clover Grasslands	2	N	N
KY006019	Species and Crop Management Effects on the Yield and Quality of Round Bale Silage	2	N	Y
KY006020	Plant Genetic Resource Conservation and Utilization	2	Y	N
KY006022	Seed Biology and Technology Investigations	2	Y	Y
KY007001	Beef cattle grazing: Endophyte-infected tall fescue with alfalfa and water quality in stream pasture	2	Y	Y
KY007003	Lipid-derived flavors/odors and their association with food proteins	2	N	N
KY007005	Induction of puberty onset in beef cattle	2	N	N
KY007008	Evaluation of supplemental chromium on glucose tolerance and performance of swine	2	N	Y
KY007009	Breeding to optimize maternal performance and reproduction of beef cows in the southern regions	2	Y	Y
KY007010	Metabolic relationships in supply of nutrients for lactating cows	2	Y	N

**Table 1, KAES program 2(continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY007012	The effect of dietary fiber type and amount on large intestinal volatile fatty acids and water balance in horses	2	N	N
KY007013	The formation and treatment of ovarian cysts in dairy cows	2	N	N
KY007014	Strategies for improving ewe lactational performance and predicting preweaning growth of lambs harvesting the milk produced	2	N	N
KY007015	A molasses-based, strategic supplementation program to enhance beef cow reproductive performance and calf weaning weight from endophyte- infected tall fescue pasture	2	N	Y
KY00900	Pathogenesis of Equine Infectious Anemia	2	Y	N
KY01042	Technical and Economical Efficiencies of Producing and Marketing Landscape Plants	2	Y	Y
KY011001	Anthropod Repellency and Host-Plant Resistance in <i>Lycopersicon hirsutum</i>	2	Y	N
KY011002	Characterizing Drought Resistance & Chemical Thinning of Fruit Crops	2	Y	N
KY011004	Post-translational Methylation of Lysyl Residue 14 in the Large Subunit of Ribulose-1,5-Bisphosphate Carboxylase/Oxygenase	2	N	N
KY011005	Rootstock and Interstem Effects on Pome and Stone Fruit Trees	2	Y	Y
KY011006	Controlled Water Table Irrigation for Container Plant Production	2	N	Y

**Table 1, KAES program 2(continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY012001	Mechanisms of Transmission of Plant Viruses that Have a Nonpersistent Vector Relationship	2	N	N
KY012003	Biological Control and Management of Soilborne Plant Pathogens for Sustainable Crop Production	2	Y	N
KY012006	Genetic Determinants of Parasitism and Pathogenicity in <i>Colletotrichum graminicola</i>	2	Y	N
KY013001	Impact of structural change in the dairy industry	2	Y	Y
KY013002	Rural Restructuring Causes and Consequences of Globalized Agricultural and Natural Resource Systems	2	Y	N
KY014001	Melatonin and Seasonal Breeding in Mares	2	N	N
KY014002	NRSP-8 National Animal Genome Research	2	Y	N
KY014003	Changes in Gene Expression in Equine conceptuses and Uteri During the Estrous Cycle and Early Gestation	2	N	N
KY014004	Identification, and Development as Vaccinal Immunogens, of the Equine Herpesvirus-1 (EHV-1) Proteins and Their Respective Subregions (Epitopes) that Elicit Cytotoxic T-Lymphocyte (CTL) Immune Responses in the Horse.	2	N	N
KY014005	Induced Protectively Immunogenic Outer Envelope Proteins of <i>Leptospira kenniwicki</i>	2	N	N
KY014006	Non-Immune Cellular/Molecular Responses to Influenza Infection of the Horse	2	N	N

**Table 1, KAES program 2(continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY014007	NAGRP Species Coordinator for the Horse	2	Y	N
KY03509	Analytical Effects on Performance of Drugs Methods for Detection of Drugs and Their Metabolites	2	N	Y



**Table 1, KAES Program 3 (Continued)****Table 1 Continued: Multi-state and Multi-function Nature of Key Program Components**

**KAES program 3.** To increase the availability of safe, nutritious, affordable foods while advancing our knowledge of human health and nutrition, is equivalent to CSREES goals 2 and 3.

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY004009	Fruit and vegetable supply-chain management, innovation and competitiveness	3	Y	Y
KY00449	Comparison of forage finishing systems, carcass traits and processing technologies	3	N	Y
KY00482	Spatial Dynamics of Leafhopper Pests and Their management on Alfalfa	3	Y	N
KY00668	Functional properties of food proteins	3	Y	Y
KY007002	Enhancing food safety through control of foodborne disease agents	3	Y	Y
KY007006	Microbial strategies for improving the efficiency of ruminant production by enhancing propionate metabolism in the rumen	3	N	N
KY007007	Molecular characterization of carbohydrate utilization by anaerobic bacteria	3	N	N
KY007011	Mastitis resistance to enhanced dairy food safety	3	Y	N
KY008006	Biological Control of Selected Arthropod Pests and weeds	3	Y	N
KY008011	Sytematics and biodiveristy of biological control agents with special reference to the Braconidae	3	Y	Y

**Table 1, KAES Program 3 (Continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY008012	Dynamic soybean insect management for emerging agricultural technologies and variable environments	3	Y	Y
KY008013	Biological active products derived from insect parasitoid-host interactions	3	N	Y
KY010001	Dietary Vitamin E/Fat and Oxidative Damage	3	N	N
KY010002	Effects of fish oil and N-3 fatty acid on antioxidant defense system and inflammatory processes associated with infection	3	N	N
KY010003	Histamine and the neuroregulation of food intake	3	N	N
KY010004	Effect of Dietary Antioxidants on Hepatic NF-kB activation	3	N	N
KY012004	Mechanisms of Virus Particle Disassembly during the Establishment of Plant Virus Infections	3	N	N
KY9700617	Zinc Nutrition and Vascular Endothelial Integrity	3	N	N

**Table 1, KAES Program 4 (continued)****Table 1 Continued: Multi-state and Multi-function Nature of Key Program Components**

**KAES program 4.** To improve environmental quality by developing more effective approaches to the stewardship of natural resources, and by revealing the relationships between management practices and and, air and water, is equivalent to CSREES goal 4.

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY000065	Characterization of Phytoalexin and Sterol Biosynthetic Genes in Tobacco	4	Y	N
KY000321	Nutritional systems for swine to increase reproductive efficiency	4	Y	Y
KY004004	Economic and environmental impacts of water-quality protection policies on Kentucky agriculture	4	N	Y
KY004007	Agricultural industrialization and globalization: implications for rural economies	4	N	N
KY00494	Nursery Inspection	4	Y	Y
KY005004	Water and Solute Transport in Soils With Perched Water Tables	4	N	N
KY005005	Residential Air Infiltration and Air Quality	4	Y	N
KY005006	Development and Application of Comprehensive Agricultural Ecosystems Models	4	Y	Y
KY005008	Measuring and Predicting Soil Compaction Caused By Machinery	4	N	N
KY006001	Phenology, Population Dynamics, and Interference: A Basis for Understanding Weed Biology and Ecology	4	Y	Y
KY006002	Soil and crop nitrogen testing to improve nitrogen management for burley tobacco	4	Y	Y

**Table 1, KAES Program 4 (continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY006005	Characterization, Classification, and Use Interpretations of Kentucky Soils	4	N	Y
KY006011	Effect of Tillage and Land Use on Physical and Chemical properties of Kentucky Soils	4	N	N
KY006018	Mineralogical Controls on Colloid Dispersion and Solid-Phase Speciation of Soil Contaminants	4	Y	N
KY008001	Simple dynamical models for incorporating biological control agents into IPM decision making	4	Y	Y
KY008002	Biology and management of insects attacking urban landscape plants	4	N	Y
KY008003	Molecular dissection of polydnavirus functional activities	4	N	N
KY008004	Ecology and Management of European Corn Borer and Other Stalk Boring Lepidoptera	4	Y	Y
KY008005	Impacts of Spiders in Food Webs of Crop and Forest-Floor Ecosystems	4	N	Y
KY008007	Development and Integration of Entomopathogens into Pest Management Systems	4	Y	N
KY008008	Evolutionary Genetics of Developmental and Age-Related Changes in Social Signals	4	N	N
KY008009	Mating Disruption and the Evaluation of Pheromone Communication in Moths	4	N	N

**Table 1, KAES Program 4 (continued)**

<b>KAES project number</b>	<b>Program Component</b>	<b>KAES Program</b>	<b>Multi-state</b>	<b>Multi-function</b>
KY008010	Phytochemical and physiological effects of herbivore feeding guild interactions: The impact of bud herbivore and gypsy moth success	4	N	N
KY009001	Effect of Forest Management Practices on Nutrient Status	4	N	N
KY009002	Economic Assessment of Surface Mine Reclamation Alternatives	4	Y	Y
KY009003	Intraspecific Phylogeography of Plant Mitochondrial DNA	4	N	N
KY009004	Roost Selection of Bats in Forests in Eastern Kentucky	4	Y	Y
KY012005	Genetic Analysis of Bioprotective Alkaloids Produced by Grass Symbionts	4	N	N
KY012007	Mycovirus-host Interaction in Diseased Isolates of <i>Helminthosporium victoriae</i>	4	N	N
KY012008	Managing Plant-parasitic Nematodes in Sustainable Agriculture with Emphasis on Crop Resistance	4	Y	Y
KY012009	Genetic Analysis of Avirulence/Virulence in <i>Magnaporthe grisea</i> , a Pathogen of Rice and Other Grasses	4	N	N
KY099001 AGR/ANS	Animal manure and waste utilization treatment and nuisance avoidance for a sustainable agriculture	4	Y	Y

**Table 1, KAES Program 4 (continued)**

**Table 2: Budget and FTE's for Key Program Components:**

**KAES Program 1.** To promote economic opportunity and quality of life for Kentucky communities by elucidating critical economic and social issues and their relationships to natural and human resources, is equivalent to CSREES Goal 5.

<b>KAES project number</b>	<b>KAES Program</b>	<b>Hatch dollars</b>	<b>Regional dollars</b>	<b>Mc/Intyre Stennis dollars</b>	<b>Animal Health dollars</b>	<b>State dollars</b>	<b>Total dollars</b>	<b>SY</b>	<b>PY</b>	<b>TY</b>
KY004005	1	68,993				82,557	151,550	1.16	2.41	0.16
KY004006	1	22,193	34,500			48,156	104,849	0.39	0.56	0.16
KY004008	1	7,093	18,760			135,481	161,334	1.46	0.81	0.16
KY011003	1	12,933				67,965	80,898	.25	1.8	2.05
KY013003	1		7,040			14,072	21,112	0.5	1.0	1.5

**Table 2 Continued: Budget and FTE's for Key Program Components.**

**KAES program 2.** To enhance the competitive position of agricultural producers and diversity of agricultural systems, is equivalent to CSREES goal 1.

KAES project number	KAES Program	Hatch dollars	Regional dollars	Mc/Intyre Stennis dollars	Animal Health dollars	State dollars	Total dollars	SY	PY	TY
KY00066	2	1,500				138,375	139,875	0.8	0.5	1.0
KY00098	2	19,093				63,053	82,146	0.56	1.25	0.16
KY00220	2					145,062	145,062	00	2.0	2.0
KY003349	2	10,928				38,237	49,165	0.53	0.03	0.29
KY004001	2					37,829	37,829	0.48	00	00
KY004002	2	28,068				60,799	88,867	0.53	1.6	0.16
KY004010	2	9,368	30,525			126,052	165,945	1.58	1.6	0.16
KY005001	2	49,492	4,233			130,350	184,075	1.10	5.95	0.77
KY005002	2	26,215				89,885	116,100	1.17	0.97	0.85
KY005003	2	51,939				24,046	75,985	0.76	0.79	1.20
KY005007	2	37,826				72,183	110,009	0.66	1.49	1.66
KY00591	2	80,859				53,233	134,082	.64	2.3	2.8
KY00593	2	29,045				89,822	118,867	1.1	1.6	2.7
KY00594	2	31,437				13,092	44,529	0.12	1.1	1.2
KY006003	2	7,015				152,535	159,550	1.0	00	4.0
KY006004	2	44,926				150,805	195,731	1.6	1.0	2.0
KY006006	2	24,705				102,185	126,890	1.0	0.5	1.0
KY006007	2	1,500				81,701	83,201	0.2	00	2.0
KY006008	2	21,960				155,111	177,071	0.9	3.0	00
KY006009	2	24,471				20,499	44,970	0.3	00	1.0
KY006010	2	20,922				134,611	155,533	1.5	0.5	2.0
KY006012	2	48,003				37,975	85,978	0.9	00	1.0
KY006013	2	13,500				93,525	107,025	0.8	00	1.5
KY006014	2	23,613				144,932	168,545	1.7	00	2.0

**Table 2, KAES Program 2 (continued)**

<b>KAES project number</b>	<b>KAES Program</b>	<b>Hatch dollars</b>	<b>Regional dollars</b>	<b>Mc/Intyre Stennis dollars</b>	<b>Animal Health dollars</b>	<b>State dollars</b>	<b>Total dollars</b>	<b>SY</b>	<b>PY</b>	<b>TY</b>
KY006015	2	20,800				78,744	99,544	0.9	00	1.0
KY006016	2	25,800	22,177			58,408	106,385	0.9	0.5	2.0
KY006017	2	1,500				81,791	83,291	0.7	0.5	1.5
KY006019	2	1,500				104,977	106,477	0.9	0.5	1.0
KY006020	2	1,500	1,000			128,595	131,095	1.0	1.0	00
KY006022	2	1,500	35,536			162,045	199,081	0.8	1.5	2.6
KY007001	2	62,994				128,224	191,218	0.98	2.75	2.0
KY007003	2	28,473				60,467	88,940	1.16	0.50	0.50
KY007005	2	20,700				45,265	65,965	0.66	1.0	00
KY007008	2	15,479				76,149	91,628	0.78	00	00
KY007009	2	500	19,011			24,860	44,371	0.52	00	00
KY007010	2	59,141	15,440			77,815	152,396	1.08	1.26	2.0
KY007012	2	74,293				56,470	130,763	0.62	3.9	0.5
KY007013	2	137,946				182,105	320,051	0.77	1.22	4.0
KY007014	2	18,783				24,230	43,013	0.50	00	00
KY007015	2	52,071				36,456	88,527	0.24	1.0	00
KY00900	2	25,139				96,083	121,222	0.48	1.1	0.49
KY01042	2		18,060				18,060	0.14	00	0.14
KY011001	2	42,825				126,500	169,325	1.67	2.3	3.97
KY011002	2	104,232				50,316	154,548	1.28	2.9	4.2
KY011004	2	37,861				131,022	168,883	1.4	2.8	4.2
KY011005	2	32,604				45,844	78,448	0.15	2.0	2.2
KY011006	2	44,170				48,021	92,191	0.87	1.2	2.1
KY012001	2	50,787				177,726	228,513	1.1	0.7	3.0
KY012003	2	51,791	32,406			45,826	130,023	0.9	00	1.5
KY012006	2	25,752				68,916	94,668	0.7	1.0	0.5
KY013001	2	27,178	7,038			45,923	80,139	1.0	2.0	3.0
KY013002	2		14,740			33,194	47,934	0.5	1.0	1.5



**Table 2, KAES Program 2 (continued)**

<b>KAES project number</b>	<b>KAES Program</b>	<b>Hatch dollars</b>	<b>Regional dollars</b>	<b>Mc/Intyre Stennis dollars</b>	<b>Animal Health dollars</b>	<b>State dollars</b>	<b>Total dollars</b>	<b>SY</b>	<b>PY</b>	<b>TY</b>
KY014001	2	41,282				122,733	164,015	1.08	0.09	1.87
KY014002	2									
KY014003	2	41,282				99,450	140,732	1.08	0.09	0.87
KY014004	2				32,436	179,345	211,781	1.37	0.78	0.58
KY014005	2				32,436	173,339	205,775	1.37	0.09	0.58
KY014006	2	68,829				149,020	217,849	1.37	0.8	2.17
KY014007	2		25,000			96,255	121,255	1.0	0.09	00
KY030509	2	10,928				38,237	49,165	0.53	0.03	0.29
KY099002AGR	2	23,725	21,767			54,053	99,545	0.9	0.5	1.0
KY09902ENT	2	19,559	34,054			46,367	99,980	0.7	1.0	0.4

**Table 2 Continued: Budget and FTE's for Key Program Components.**

**KAES program 3.** To increase the availability of safe, nutritious, affordable foods while advancing our knowledge of human health and nutrition, is equivalent to CSREES goals 2 and 3.

KAES project number	KAES Program	Hatch dollars	Regional dollars	Mc/Intyre Stennis dollars	Animal Health dollars	State dollars	Total dollars	SY	PY	TY
KY004009	3	7,093	11,240			56,915	75,248	0.72	0.06	0.16
KY00449	3	16,780				46,924	63,704	0.65	0.5	00
KY00482	3	36,234	4,090			47,007	87,331	0.3	1.0	0.1
KY00668	3	11,300	2,200			23,971	37,471	0.02	0.50	1.0
KY007002	3	56,130	2,200			55,169	113,499	0.72	00	1.0
KY007006	3	9,700				95,997	105,697	0.07	0.50	1.0
KY007007	3	31,658					31,658	0.60	0.50	1.0
KY007011	3	21,830	6,308			33,170	61,308	0.61	00	00
KY008006	3	13,350	25,828			40,786	79,964	0.9	0.5	0.8
KY008011	3	39,385				50,050	89,435	0.7	0.5	1.2
KY008012	3	6,803	19,418			14,935	41,156	0.3	0.5	0.6
KY008013	3	71,816				62,938	134,754	0.8	0.5	2.2
KY010001	3					62,033	62,033	0.84	00	00
KY010002	3					43,191	43,191	0.50	00	00
KY010003	3					38,420	38,420	0.30	00	00
KY010004	3					46,070	46,070	0.66	00	00
KY012004	3	4,037				128,221	132,258	0.9	1.0	1.5
KY9700617	3					50,225	50,225	0.63	00	00

**Table 2, KAES Program 4 (continued)**

**Table 2 Continued: Budget and FTE's for Key Program Components.**

**KAES program 4.** To improve environmental quality by developing more effective approaches to the stewardship of natural resources, and by revealing the relationships between management practices and and, air and water, is equivalent to CSREES goal 4.

KAES project number	KAES Program	Hatch dollars	Regional dollars	Mc/Intyre Stennis dollars	Animal Health dollars	State dollars	Total dollars	SY	PY	TY
KY00065	4	1,500				69,760	71,260	0.7	0.5	00
KY00321	4	7,414	16,000			78,516	101,930	0.84	0.93	00
KY004004	4	88,363				70,597	158,960	1.9	1.06	0.16
KY004007	4	65,928				94,362	160,290	1.39	1.56	0.16
KY00494	4					24,639	24,639	00	2.0	1.2
KY005004	4	36,507				78,809	115,316	0.98	2.47	1.62
KY005005	4	23,909				45,943	69,852	0.95	0.14	1.28
KY005006	4	75,556	17,777			159,039	252,372	1.03	2.09	2.73
KY005008	4	5,007	11,811			85,963	102,781	0.98	1.49	1.39
KY006001	4	24,230	60,347			151,308	235,885	1.6	1.5	2.0
KY006002	4					47,272	47,272	0.4	00	1.0
KY006005	4	47,296				40,001	87,297	0.6	0.5	1.0
KY006011	4	24,078				84,089	108,167	1.4	0.5	1.0
KY006018	4		40,240			38,522	78,762	0.6	0.5	1.0
KY008001	4	31,662				15,870	47,532	0.5	00	0.7
KY008002	4	27,187				53,997	81,184	0.7	00	1.2
KY008003	4	27,961				39,742	67,703	0.8	00	1.2
KY008004	4	8,335	2,800			4,255	15,390	0.1	00	0.2
KY008005	4	42,558				34,675	77,233	0.8	0.5	1.0
KY008007	4	22,997	4,400			10,615	38,012	0.3	00	0.3
KY008008	4	28,370				23,160	51,530	0.8	1.0	1.0
KY008009	4	31,288				18,855	50,143	0.8	00	1.0
KY008010	4			30,000		60,431	90,431	0.9	1.0	1.1
KY009001	4			110,537		172,232	282,769	2.21	0.33	3.65

**Table 2, KAES Program 4 (continued)**

<b>KAES project number</b>	<b>KAES Program</b>	<b>Hatch dollars</b>	<b>Regional dollars</b>	<b>Mc/Intyre Stennis dollars</b>	<b>Animal Health dollars</b>	<b>State dollars</b>	<b>Total dollars</b>	<b>SY</b>	<b>PY</b>	<b>TY</b>
KY009002	4			49,949		209,401	259,350	2.07	1.0	3.0
KY009003	4			40,457		99,563	140,020	1.46	00	1.33
KY009004	4			55,573		105,103	160,676	0.79	0.83	2.32

**Table 2, KAES Program 4 (continued)**

KY012005	4	60,881				146,407	207,288	1.0	2.0	2.5
KY012007	4	21,597				129,357	150,954	0.8	0.9	1.5
KY012008	4		1,000				1,000	0.1	0.1	0.1
KY012009	4	47,177				79,307	126,484	0.8	2.0	0.5
KY099001AGR	4	50,110	27,929			4,052	82,091	1.3	0.5	1.0
KY099001ANS	4	62,292	10,660			64,506	137,458	0.66	1.55	0.86