Texas Cooperative Extension

and

Texas Agricultural Experiment Station

[1]Joint Annual Report of Accomplishments and Results: FY 2003

Texas A&M University System
Agriculture Program

For Federal Reporting Year
2003

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Texas Cooperative Extension (TCE)
and
Texas Agricultural Experiment Station (TAES)

FY 2003 Joint Annual Report of Accomplishments and Results

A. PLANNED PROGRAMS

Goal 1: An agricultural system that is highly competitive in the global economy

Overview

Texas Cooperative Extension and Texas Agricultural Experiment Station programs under Goal 1 focus on increasing the competitiveness and profitability of the agricultural industry in the state, nation, and world. Three programs representing a broad sector of the agricultural community are represented by this goal. These programs include risk management, field and forage crop production, and, livestock quality and production.

Risk Management. Risk is inherent at all levels of the food and fiber system. For the Texas food and fiber system to become more competitive, profitable, and sustainable (in light of recent weather patterns; changing agricultural and trade policies; and highly volatile commodity and input prices), farmers, ranchers, and organizations–plus the communities that are dependent upon agriculture--must be better able to weigh the risks and projected impacts of alternative decisions on profitability and competitiveness. Managing the increased price and income risk will be key to the future economic success of production agriculture and agribusiness firms in Texas. As economic stress intensifies, risk management–knowing the probabilities associated with what to do and what not to do–becomes even more important to the long term goal of a profitable and sustainable agriculture.

In response to the described need, TCE-TAES coordinated the development and delivery of multifaceted programs in policy analysis, risk assessment, risk management, and in-depth management/marketing education. Specific programs to be highlighted include the TCE-TAES jointly developed *FARM Assistance* decision support system, the *Agricultural and Food Policy Center (AFPC)* developed software, Base and Yield Analyzer (BYA), used directly by producers or in meetings with county Extension faculty to determine optimum decisions as a result of new rules in the 2002 Farm Bill, the *Center for North American Studies (CNAS)* evaluates trade policy scenarios and their economic impacts on various sectors of the agricultural economy, and financial recordkeeping tools and management information systems have improved risk management decisions for beef cattle producers through the *Standardized Performance Analysis (SPA)* program.

Field and Forage Production. Environmental stresses, crop pests and global market forces make profitable and sustainable production of crops and forages a continuing challenge. It is through understanding and adoption of technologies that improve productivity, profitability and global competitiveness of crop and forage production systems that Texas farmers and ranchers will enhance their competitive position to other producers around the world. The target audience includes farmers and ranchers who produce field crops and forage in Texas. Applied research and outreach education programs through Texas Cooperative Extension had significant impacts on the production and economic success of growers in Texas in 2003. Through local, regional and statewide programs, Texas producers are the recipients of timely, sound and objective research-based information to enhance their production success.

Livestock Quality and Profitability. Texas ranks first in the nation in total livestock value and has the broadest spectrum of producers and variation in production environments. High production costs and variable sale receipts for all livestock species necessitates adoption of best management practices to efficiently produce livestock and their resulting end-products that are cost-competitive with consumer alternatives while meeting the food quality and safety standards expected by our society. Educational programs are needed to increase producer awareness of consumer concerns and implementation of advancements in research proven production practices and developments in technologies to meet those needs while increasing net returns from livestock operations. Research and education programs focus on livestock genetics, nutrition, reproduction, cost effective best management practices and how producers can increase profitable production efficiency while still producing high quality, safe, wholesome end products. Specific livestock recommended management practices in selection, nutrition, reproductive physiology, health, and meat science are emphasized. Other factors that influence product acceptability in the market such as marketing methods and food safety issues are stressed.

Sources of TCE-TAES Funding and FTEs

TCE Funding: Smith Lever and State Matching

		$ X 1000 Actual FY 2003
Program 1 – Risk Management		1,500
	FTEs	22.79
Program 2 – Field Crops & Forage Production		2,403
	FTEs	111.5
Program 3 – Livestock Quality & Profitability		3,060
	FTEs	143.73
Total Allocated Resources Goal 1		**7,571**
	FTEs	**353.15**

TAES: Hatch, and state, federal and private contracts and grants

Source of Funding and FTEs

Federal Funds ($ x 1000):	4,035
State Funds ($ x 1000):	17,289
FTEs:	120.00
Number of Projects:	349
Number of Publications:	1,367

State TCE-TAES Plan of Work Program 1: Risk Management
Key Theme: Risk Management, Agricultural Competitiveness, and Agricultural Profitability

A. Description of Activity

Risk is inherent at all levels of the food and fiber system. For the Texas food and fiber system to become more competitive, profitable, and sustainable (in light of recent weather patterns; changing agricultural and trade policies; and highly volatile commodity and input prices), farmers, ranchers, and organizations–plus the communities that are dependent upon agriculture--must be better able to weigh the risks and projected impacts of alternative decisions on profitability and competitiveness. Managing the increased price and income risk will be key to the future economic success of production agriculture and agribusiness firms in Texas. As economic stress intensifies, risk management–knowing the problems associated with what to do and what not to do–becomes even more important to the long term goal of a profitable and sustainable agriculture.

In response to the described need, TCE-TAES coordinated the development and delivery of multifaceted programs in policy analysis, risk assessment, risk management, and in-depth management/marketing education. In the past, policy, management, and marketing changes were evaluated based on average results. But, in Texas, averages do not tell the story–the risk of upside and downside swings also must be evaluated for long-term survivability. Educational and applied research programs are focused on (1) intensive education in group settings; (2) use of master volunteers and county Extension personnel to expand extension and research communication; and (3) one-to-one assistance in financial and risk management. As one example, along with numerous one-day events on various risk management topics, one producer group attended a 64-hour class as part of the *Master Marketer* workshop program in FY03. These individuals greatly enhanced their risk management knowledge and skills. These Master Marketer graduates then became marketing club leaders in their respective counties thereby teaching others about risk management tools. More than 90 marketing clubs statewide have been organized or revitalized through Master Marketer volunteers and county Extension agents over the past few years with combined membership over 1,000. A new, in-depth training program for new and emerging producers was launched in FY03. Over 100 contact hours with each participant is planned through the 15-month curriculum. One-to-one producer assistance using district-based risk management specialists was facilitated through the TCE-TAES jointly developed *FARM Assistance* decision support system. Individual agricultural operations statewide, using information specific to their business, can now effectively assess the riskiness of proposed changes and the projected impact of those changes on their net worth 10 years down the road. Producers completing a FARM Assistance analysis agree to have their information entered into a confidential database for use by research economists as well as for the development of educational programs to serve additional producers, some from underserved populations.

The *Agricultural and Food Policy Center (AFPC)* developed software, Base and Yield Analyzer (BYA), was used directly by producers or in meetings with county Extension faculty to determine optimum decisions as a result of new rules in the 2002 Farm Bill. FSA-USDA adopted the software nationwide and made copies available in all of their county offices across the nation. The farm program is an integral part of the risk management decisions producers

must make. AFPC also conducted analyses for Congressional leadership and communicated results to state and national commodity groups.

The *Center for North American Studies (CNAS)* evaluates trade policy scenarios and their economic impacts on various sectors of the agricultural economy. Recently, CNAS also was asked to explore issues concerning the Water Treaty with Mexico that was to provide Mexican water for irrigation in the Rio Grande Valley of Texas. Since Mexico is currently non-compliant with the treaty, agricultural interests in South Texas have missed out on millions of dollars of agricultural receipts–impacting the local economy.

Financial recordkeeping tools and management information systems have improved risk management decisions for beef cattle producers through the *Standardized Performance Analysis (SPA)* program. This one-to-one joint TCE-TAES program has led to computerized decision aids using Excel spreadsheets. The SPA database also is used for applied research and the development of improved education programs for beef producers.

The program emphasis in risk management is targeted toward owners and operators of commercial size farms and ranches in Texas. Some of these commercial operations are geographically disadvantaged in that they are located in isolated areas of the state. Marketing clubs and the delivery of education based on the FARM Assistance database are reaching underserved populations, such as along the border with Mexico. Through additional funding support from the Southern Region Risk Management Education Center, risk management programs have been adapted for small scale agriculture audiences through the network of 1890 institutions in the South.

TCE-TAES are collaborating with other CSREES partners, including Kansas State, Oklahoma State, Mississippi State, Montana State, University of Minnesota, Iowa State, University of Missouri, Cornell, Virginia Tech, New Mexico State, Louisiana State, and the Prairie View A&M Cooperative Extension Program. External collaborators include the Texas Farm Bureau, the Texas Corn Producers Board, the Texas Wheat Producers Board, Texas Cotton State Support Committee, and the U.S. Rice Foundation.

B. Impact of Programs

Master Marketer Educational System (MMES): MMES consists of a number of coordinated educational efforts including: Master Marketer training, Advanced Topics Series, Master Marketer for Agricultural Lenders, Tomorrow's Top Agricultural Producers Program (for young producers), leveling workshops, and marketing club activities. These group training efforts are supported by the *Risk Management Curriculum Guide; Marketing Club Leaders Guide;* a website for education and market updates; newsletters; and market outlook & agricultural policy update teleconferences.

One result of the in-depth Master Marketer Workshops is producers highly trained on the subject of risk management. In surveys of participants conducted 2.5 years after they completed the 1996-2001 Master Marketer workshops, 520 producers estimated, on average, that their *annual* incomes had improved by $32,280 as a result of adopting effective marketing and risk management practices. If the 106 producers who have participated in the eight in-depth workshops since mid-2001 received similar results, then the aggregate *annual* impact of this part of the program in Texas would approach $20.2 million in added combined income to these 626 producers!

The training appeared to have a major impact on the participants' risk management practices. For example, prior to the in-depth training, 37 percent of 520 producer-graduates from the 1996-2001 workshops said they had marketing plans. Two and a half years later, 87 percent said they had developed marketing plans. Prior to the workshops, 45 percent said they used breakeven costs in marketing decisions. Two and a half years later, 78 percent indicated they incorporated breakeven price information into their enterprise plans. Similar improvements were reported for other knowledge and skill variables.

Master Marketer graduates agree to share what they have learned with others in their respective counties through small marketing club study groups. This volunteer aspect greatly multiplies the educational impact of the program. More than 90 marketing clubs have been started or revitalized by Master Marketer volunteers–helping to extend risk management education to producers across the state. Seventy-six clubs were surveyed in 2002 with a total membership of 1,054 (an average membership of about 14 producers each). Members of these clubs were surveyed again in 2003. Of the 407 producers who responded to the survey, marketing club members indicated they increased their gross revenue by an average of $12,399 per year as a result of their participation in a marketing club. Follow-up telephone calls were made to a sample of non-respondents. No significant difference was found between those that completed the survey and those that did not mail one in–adding validity to the survey results. Producers also reported a 60 percent increase in their use of marketing tools to manage price risk since becoming a member of a marketing club.

A Risk Management Curriculum Guide was expanded to provide information to those who cannot attend the in-depth sessions or marketing clubs. These publications are available through the National Ag Risk Library, the Texas Cooperative Extension risk management web site or can be obtained in printed form from local county Extension offices. Underserved audiences can access these excellent materials either way. Of the top 20 requested publications from the National Ag Risk Library, five were developed as part of the Texas Risk Management Curriculum Guide.

A new publication on risk management has been developed for small scale agriculture which can be used with part-time or limited resource producers. The *Risk-Assessed Business Planning for Small-Scale Producers* workbook was developed in collaboration with faculty from Prairie View A&M University Cooperative Extension Program. The curriculum of lesson plans and worksheet examples was spotlighted at the national meeting of 1890 institutions in June 2003. It is too early to have information on adoption of this new teaching tool by faculty from 1890 institutions.

Two outcomes from the Master Marketer program have been requests from other target audiences for specialized in-depth programs related to risk management: 1) a program designed specifically for agricultural lenders has been conducted three times in order to be sure that lenders are as knowledgeable as producers in the use of risk management alternatives. (FSA loan officers regularly attend these special workshops.) and, 2) with the risk in agriculture, a new program is being started to assist young producers with handling risk.

Tomorrow's Top Agricultural Producer (TTAP): Tomorrow's Top Agricultural Producer Program was launched in FY03 to reach the vulnerable audience of new and emerging producers. With the risk and financial commitment necessary to enter farming or ranching in today's economic environment, new producers need all the financial and risk management assistance they can get. The entire curriculum covers four weeks over a 15-month period. Over 100 contact hours are planned with participants in this intensive program that focuses on the

necessary elements of developing a formal business plan for their operation–a way to provide the business tools that all producers need to effectively manage and market their production. Volunteer mentors are planned as Phase II of the intensive program where each program participant will be assigned three mentors. To date, 48 individuals have participated in this program.

Two of the four sessions were conducted in FY03. Early results have been very rewarding. The evaluation plan included pre and post-tests after each week-long session. The pre-test scores of participants for the Session I subject matter averaged 39.6% (out of 100%). The post-test score after Session I averaged 69%–a gain of almost 30 points. For Session II, the pre-test average score was 48.1% (again out of 100). The post-test score after Session II averaged 74%–a gain of about 26 points. A formal evaluation of the entire program will be conducted in early 2005.

FARM Assistance: Financial and Risk Management (FARM) Assistance is a unique combination of Extension risk management specialists working one-to-one with producers–backed up by a sophisticated computerized decision support system planned, developed, and regularly modified by a team of TAES and TCE scientists. The FARM Assistance software allows risk assessment of differing strategic alternatives for the farm or ranch. As farming operations are becoming more diverse and complex, individual analyses of risk and financial factors, using research-based tools, are needed. More than 1,500 alternative risk management scenarios have been analyzed for individual producers since 1999–representing over one million acres of crop and pasture land.

One measure of the FARM Assistance program's impact is the projected net worth consequences of each risk assessment subscriber's starting situation versus the best-case or worst-case scenario. This measure indicates the potential gain or loss in net worth a producer could potentially see, at the end of the 10-year planning horizon, from a decision to continue current practices versus another alternative under consideration. From all the producers in the database, on average, a $27,663 per year difference in net worth was calculated for this measure. For the 10-year planning horizon, that's an average swing in real net worth of just over $275,000 per participant for the alternatives being considered. Thus, risk assessment, using the TCE-TAES developed FARM Assistance decision support system can pay big dividends. In fact, seventy-three percent of the FARM Assistance subscribers responding to a survey indicated that their participation in the program allowed them to make a change that likely will have a positive financial impact on their operation. Eighteen percent said the analysis helped them avoid making a decision that likely would have had a negative risk impact.

Real life examples of program impact can be demonstrated from selected case examples: 1) A producer in the Texas Panhandle was looking to purchase a section of irrigated land, but was unsure if the asking price was feasible. After going through FARM Assistance, he learned that buying the land would most likely have a positive impact on his operation's financial position. The producer also was able to use the FARM Assistance analysis in obtaining financing for the land purchase; 2) A Texas Coastal Bend cotton producer was interested in gradually retiring and shifting a greater percentage of the farming partnership to a son. The partners were concerned about the increased work load on the son and/or the cost of hiring additional labor. The FARM Assistance analysis revealed that their plan to hire a full time employee was indeed a feasible solution, allowing them to move forward with confidence; 3) A Texas Panhandle cattle producer was struggling financially. His lender was asking for an equity investment of $50,000 and intended to reduce his operating line of credit. Working with the

FARM Assistance program, two alternative refinancing strategies were analyzed. One strategy would be feasible if drought conditions continue, and the other was not a workable plan unless grazing conditions improved. The risk management specialist presented the analysis to the producer's lender, who agreed to a refinancing plan.

In addition to the advantages that individual producers receive for participating in this significant effort, many other producers and associated agribusiness firms are benefiting from the database that is being developed from accumulating the individual analyses. Producers want to compare the critical success factors in their operation to those of similar operations nearby. This secondary impact of the program is being used to further target educational programs and applied research efforts. Underserved audiences will be able to glean risk management ideas from database summaries. Joint TAES-TCE contributed papers have been presented on best risk management practices, success rates under alternative debt scenarios, and policy and tax impacts on types of operations. For example, state legislators have asked to see the impacts of certain state tax scenarios on case farms and ranches in the database. A study of a proposed bill indicated that some producers would see a minimal benefit (a 1.5% increase in profits) while others would face as much as a 20% loss in farm profitability. The study also revealed that losing special tax considerations, such as sales tax exemptions or property tax valuations, would cost farmers and ranchers from 20% to a devastating 80% of their current net income. Analyses such as this will be invaluable for policy makers and farm organizations in the future.

Agricultural and Food Policy Center (AFPC): The Agricultural and Food Policy Center (AFPC) is a joint program of TAES and TCE. The decisions of producers regarding farm bill options is an integral part of risk management. One of the highest visibility efforts of the Center in FY03 was the development of a computer program for farmers to use to analyze their base acreage and payment yield update options under the 2002 farm bill. The software, Base and Yield Analyzer (BYA), was developed in cooperation with the Farm Service Agency (USDA-FSA). The BYA was adopted by FSA as the official base and yield update calculator, rather than FSA developing their own software. The BYA was capable of calculating update analyses for farmers in every county in the nation and was made available to farmers via the AFPC web site. AFPC also serviced the USDA website where a copy of BYA was made available to FSA personnel. Additionally, a stand-alone version of BYA was developed for FSA to use in their county offices across the nation. BYA was run more than 420,000 times, via the web, to analyze farms in 48 states. Given that more than 130 million acres were analyzed, it is estimated that the impacts of BYA on net farm income of farmers will exceed $7.8 billion over the life of the farm bill. The BYA effort resulted in AFPC research and extension scientists receiving 5 awards from national, regional, and state organizations/associations plus two USDA-FSA Administrator's Awards.

AFPC developed two baseline analyses and presented them to the House and Senate Ag Committees, USDA policy analysts, and commodity groups. The USDA Payment Limitation Commission requested that AFPC conduct an analysis of the impacts of alternative government payment limitations on representative crop farms. The results of the analysis were presented to the Commission in the only public hearing they held. Analyses of the safety net impacts of the 2002 farm bill on representative crop farms was analyzed for the House Ag Committee.

The representative dairy farm data base, developed and maintained by AFPC, was used to analyze a range of alternative dairy policies at the request of the House and Senate Ag Committees. The results of the analyses were presented at a national dairy policy conference

where university, government, and industry policy analysts and representatives reviewed and discussed the consequences of alternative policy options for the U.S. dairy industry.

Economic models of representative farms and individual commodity sectors have been developed and used to conduct comparative statistic analyses of policy changes. Results focus on the change in the profitability of farms and ranches in Texas and the U.S. due to changing various policies. Basic research for this project involved development and documentation of a simulation language that runs in Excel. The policy facilitated our development and application of Monte Carlo simulation models for policy analysis, and this system has been adopted by researchers in USDA-AMS, Purdue, and U. of Arkansas as well as FAPRI, Columbia, Mo.

Center for North American Studies (CNAS): The Center for North American Studies also combines basic and applied research with outreach delivery through extension outlets. Although the Center has many varied activities, its focus for the past few years has been on the analysis of (1) NAFTA, WTO, FTAA, and other trade policy impacts on U.S., Texas, and southern agriculture; (2) Mexican livestock, meat, and feed industries and fresh fruit and vegetable trade impacts via the North American Free Trade Agreement (NAFTA) on structure of industries resulting from trade liberalization; (3) the economic impacts of renewed agricultural exports to Cuba; and, 4) the Water Treaty with Mexico and concerns of the Lower Rio Grande Valley of Texas. Output from these analyses was presented to 29 separate groups, with a total audience of more than 1,000 persons and indirect contacts of more than 12,000. Work on the impacts of variations in exchange rates showed that a one percent increase in the value of the U.S. dollar decreased U.S. broiler exports to Japan, Hong Kong and Mexico by 0.56 percent to 0.96 percent, while the 25 percent 1994 depreciation of the Mexican peso increased their exports of melons to the United States by 4 to 36 percent.

CNAS, working with representatives of the Texas Department of Agriculture and the Texas Farm Bureau, formed the Texas-Cuba Trade Alliance (TCTA). The goal of TCTA is to educate Texas producers, agribusinesses, and trade facilitators about new regulations allowing the sale of food and other agricultural products to Cuba and resultant export opportunities and competitiveness. A regional workshop was held in Austin in May 2003 and attracted more than 65 people. CNAS also conducted applied research which estimated that, under a high export growth scenario, the value of agricultural and requisite exports to Cuba could exceed $1.2 billion, creating $2.8 billion in additional economic output, $818 per household new income, $1.6 billion in new GDP, and over 32,000 new U.S. jobs.

The fact that Mexico has not honored the Water Treaty with the U.S. which has reduced the amount of water available to the Lower Rio Grande Valley of Texas for agricultural purposes has been a very contentious issue for farmers on the Texas side of the Texas-Mexico border in South Texas. CNAS, in response to requests from stakeholder groups, attempted to analyze the additional use of water by producers in Mexico. CNAS found that total water use on irrigated crops in Chihuahua, Mexico has more than doubled since 1980, from 2.0 million acre-feet (maf) to a peak of 4.5 maf in 1997. Average annual irrigation water use increased five percent each year through 1997. Although irrigation water use declined to 3.5 maf in 2001, this is still 75 percent above the level of 1980. Between 1995 and 2001, irrigation water use in Chihuahua increased 14 percent, indicating that while water availability in reservoirs declined due to drought, producers switched to groundwater sources to irrigate their crops. Producers in Chihuahua apparently have switched from drought tolerant, low profitability crops, such as grains, forages, and soybeans, to alternatives that are more profitable, but also more water-intensive, such as alfalfa, cotton, apples, green peppers, onions, and dry beans. Increased

irrigation in Chihuahua is believed to reduce irrigation water availability in the Lower Rio Grande Valley of Texas. Increased use of aquifers and groundwater in the Rio Conchos basin of Mexico could deplete the water table in the region, reducing runoff from streams and rainfall, thereby limiting available surface water downstream in the Rio Grande River. Should this occur, it is likely that producers in the Lower Rio Grande Valley of Texas will face additional water shortages, higher costs, lower profitability, and reduced competitiveness.

Economics of Water Investments/Irrigation Technology: In the Texas Rio Grande Valley, Texas Agricultural Experiment Station (TAES) and Texas Cooperative Extension (TCE) economists are collaborating with irrigation managers and their consulting engineers to determine the economic and financial costs of projected water and energy savings with the RIDGECON model. These associated costs are being provided for the capital rehabilitation projects being proposed to the Bureau of Reclamation, the Border Environment Cooperation Commission, and North American Development Bank. To date, fifteen federally-authorized project components, with total estimated construction costs of $42.2 million, have been analyzed. Using amortization procedures, these projects are estimated to save a combined 49,392 acre-feet of water (16 billion gallons) each year, with individual project components' cost of saving water ranging from $16 to $119 per acre-foot.

Standardized Performance Analysis (SPA): Standardized Performance Analysis is a specialized applied research and extension outreach program, primarily for beef cattle producers. The Excel spreadsheet based management information system was developed and updated to analyze beef cattle financial and production performance. The Southwest Cow-Calf SPA database has 424 herds, 306,610 cows, and analytical results from this database are widely used in educational programming. Refinement of the financial statement and managerial accounting methodology continues with a coordinated effort with the Farm Financial Standards Council (FFSC) new management accounting project. This effort is helping to develop a consistent methodology in stocker/feeder cattle cost accounting for more informed, economic-based decision making by ranchers. As a result, commercial herds are more competitive and resources are used more efficiently. For example, the net income per cow in the top fourth of the herds was $140/head whereas the loss/cow was ($261) in the lowest quarter–a range of $401 in net income per cow from high to low! Best management practices can account for some of this differential.

Output Indicators:
No. of people completing non-formal risk management education programs–33,438

Outcome Indicators:
The total number of people completing non-formal risk management education programs who plan to adopt one or more risk management tools or strategies after completing these programs–3,344

The total number of people completing non-formal risk management education programs who actually adopt one or more risk management tools or strategies after completing these programs–2,174

C. Sources of Federal Funds

TCE: Smith-Lever and State Matching; USDA competitive grants and user fees

TAES: Hatch, and state, federal and private contracts and grants

D. Scope of Impact

Multi-State Extension – KS, OK, MS, MT, MN, IA, VA
Multi-State Research – MO, VA, CA, GA, OK, HW, AR, LA, NM
Integrated Research and Extension
In the highly competitive and complex economy associated with food and fiber production, research and extension led efforts have allowed the industry to better understand the probabilistic aspect of their decisions, and the decisions of others in our global economy on their economic well-being.

State TCE-TAES Plan of Work Program 2: Field and Forage Crop Production

Key Theme: Agricultural Competitiveness, Agricultural Profitability

A. Description of Activity

Environmental stresses, crop pests and global market forces make profitable and sustainable production of crops and forages a continuing challenge. It is through understanding and adoption of technologies that improve productivity, profitability and global competitiveness of crop and forage production systems that Texas farmers and ranchers will enhance their competitive position to other producers around the world. The target audience includes farmers and ranchers who produce field crops and forage in Texas.

B. Impact of Programs

Applied research and outreach education programs through Texas Cooperative Extension had significant impacts on the production and economic success of growers in Texas in 2003. Through local, regional and statewide programs, Texas producers are the recipients of timely, sound and objective information to enhance their production success.

Texas is the largest cotton production state, producing four to five million bales annually. Cotton is a perennial plant that continues to grow as long as conditions are favorable, regardless of harvest date. This poses a major pest management problem, as cotton is difficult to reliably kill through mechanical means due to unpredictable weather and reduced tillage systems. If not destroyed, the plant will continue to develop fruit, providing the boll weevil a late-season food source which significantly increases its winter survival. Early harvest and stalk destruction, when performed on an area-wide basis are the most effective cultural practices for managing over-wintering boll weevils. Early stalk destruction is especially important in regions engaged in the Texas Boll Weevil Eradication Program (~ 800,000 acres) because timely stalk destruction reduces post-harvest spraying operations, decreases pesticide use, and conserves program/producer funds. To address this issue, Texas Cooperative Extension (TCE) specialists developed applied research studies and educational programs demonstrating the effectiveness of cotton stalk destruction with herbicides. Results from theses efforts identified a suitable and very cost effective herbicide (2,4-D amine), assisted agrochemical companies in obtaining stalk destruction labels and established the optimum application timing for destroying cotton stalks. Best management practices were identified, educational programs were conducted and a publication was developed addressing this issue. More than 3,000 clientele have been contacted via educational programs, and over 10,000 copies of the publication Cotton Stalk Destruction with Herbicides were distributed via local County Extension offices and the Boll Weevil Eradication Foundation to producers and allied industry in the Southern Blacklands, Upper Coastal Bend, and South Texas Wintergarden boll weevil eradication zones and the Rio Grande Valley. Due to TCE efforts in partnership with the Texas Boll Weevil Eradication Foundation, it is estimated that 30 to 40% of producers in these regions are presently utilizing this stalk destruction approach. This has saved producers the cost of insecticide applications on thousands of acres of cotton, representing considerable fund savings for the Texas Boll Weevil Eradication program over the past two years. Moreover, TCE efforts have been lauded by the Texas Cotton Producers Association and the Texas Boll Weevil Eradication Foundation.

Previous small-plot cotton variety testing included evaluation of genetic components but not genetics in concert with management programs. Over the last five years, High Plains cotton producers have increased planted acres of transgenic cottons from approximately 300 thousand in 1997 to over 2 million in 2003. Industry continues to increase the number of herbicide-tolerant, insect-resistant, and 'stacked gene' varieties. Current small-plot variety testing programs are inadequate in scale and design to investigate the economic impact of new transgenic varieties with value-added traits. A producer survey conducted during the 2002/2003 crop conferences indicated that 78% of them planted transgenic varieties. Producers also indicated that TCE "Systems Variety Testing Project" data were extremely important for their needs, with 47% of the respondents indicating that it was their primary information source for variety selection. An overwhelming majority (70%) indicated that the information derived from these trials was "very useful", while 25% responded "somewhat useful." In addition, 68% of producers indicated that they would make a variety change based on the results that we obtained. These producers also noted that university personnel had the highest credibility (58% ranked university as #1) when variety performance information was considered followed by local dealers (24%), crop consultants (16%), and industry (2%). Identification of more profitable newer transgenic and conventional varieties is resulting in important variety shifts by High Plains producers. According to the USDA Cotton Varieties Planted reports for 2001, 2002, and 2003 significant variety changes in the High Plains can be documented. Varieties/technologies with lower overall economic returns are quickly being replaced by improved types. One example is the rapid adoption of the FiberMax 958 conventional variety, which has been identified by the "Systems Variety Testing Project" as a more profitable type. FiberMax 958 was NOT noted as one of the top 12 varieties planted in the 2001 USDA report, but was observed to be the number 5 planted variety in the 2002 crop with 7.7% of the total Lubbock Classing Office territory acreage (2.9 million acres), and 10% of the acreage in 2003. If producers realized an average of $50/acre in increased profits on these acres, this would translate to a $14.5 million increase in returns to the region in 2003 with the adoption of just this one variety.

Producers continue to maintain interest in conservation tillage systems. In major production regions in the state significant changes in producer production and tillage practices have occurred as a result of producer participation in educational meetings and events. Growers that have adopted conservation tillage practices indicated a savings of 0-$30 per acre, with most indicating $10-30. Moldboard plowing, deep ripping and other primary tillage operations have almost disappeared as a conventional tillage practice. Long term trials using conservation tillage in central, south and west Texas indicate that farmers are able to produce similar yields to crops produced with conventional tillage, have approximately a 10 fold decrease in soil erosion losses (varies with soil type, slope and location), and save approximately $10 - 30 per acre in production costs.

An educational program has been designed to reduce winter feeding costs through year round pasture, incorporation of annual legumes into management practices, and the use of stockpiled hay. This program is rated as very successful due to the increased interest indicated by the CEAs and producers in east, central and south Texas. The potential cash savings per cow per winter are staggering. An average savings approximates $100 per cow due to reduced winter feeding costs and lower fertilizer requirements for hay meadows. If this dollar amount is multiplied by the 3.2 million head of beef cows in the eastern one-third of Texas, there is a potential economic impact matched by few other programs in the state. One case study utilized this protocol and initial input costs for fertilizer on hay meadows have been reduced by over

$6000 in one year, or approximately $60/head. Continued implementation of the program will result in increased adoption of sustainable pasture management techniques and additional savings for Texas ranchers and cow-calf operators.

Another example of a successful educational program targeting pasture and land management is the Pasture & Livestock Management Workshop for Novices. This joint TAES-TCE program targets urban absentee landowners who have a limited understanding of the soil-plant-animal interface. An intensive 3-day event is held annually at the Texas A&M University Research and Extension Center at Overton. Both directly and indirectly information provided by this workshop helps insure the wise use of the state's natural resources by this growing non-traditional clientele.

Over one million tons of silage are required to sustain the feedlot industry within the Southern High Plains region, and the demand for silage grows annually as dairies. Production of this silage requires approximately one million acre-inches of irrigation water. Corn, because of its consistent quality has been the preferred source of silage. In joint TCE-TAES forage quality tests, the new brown mid-rib forage sorghums were determined to have approximately equal feeding value to corn as a silage source. The bonus with forage sorghum is that under full irrigation, it requires approximately 47 % less water than corn to produce a similar yield. Irrigation water use efficiencies for fully irrigated forage sorghum at Bushland Research Center have been documented at 1.87 tons per inch of water, compared to 1.0 ton per inch for silage corn. It is anticipated that making the shift from corn to brown mid-rib sorghum silage by the Texas High Plains feedlot industry will save 657,000 acre inches of irrigation water and $4.9 million annually in costs associated with pumping. The first three years of research and educational efforts have made a significant impact on water usage and costs associated with silage production. Several feedyard managers have informed growers that they will now accept brown mid-rib sorghum silage as a replacement for corn silage in their feeding programs. A survey conducted in 2002 indicated that a greater percentage of acres are now being planted to the brown mid-rib hybrids. Additionally, as the dairy industry continues an exponential growth in this region, the shift from high water use crops to low water use crops will be essential.

The Texas 303(d) list is a list maintained by the Texas Commission on Environmental Quality (TCEQ) of water bodies which have exceeded or are threatening to exceed accepted levels of one or more contaminants. Six water bodies which provide public drinking water in the Central Texas Blacklands were placed on this list in the late 1990s due to the presence in these lakes of atrazine, a popular corn, sorghum and turfgrass herbicide. Upon determining the threat to public water supplies, TCE specialists developed educational programs designed to reduce off-target losses of atrazine. They brought a group together which included state and federal agencies, industry and agricultural producers to focus on developing BMPs to mitigate the problem of off target atrazine runoff, while allowing continued use of this inexpensive, yet highly effective herbicide. It is estimated that loss of this herbicide would increase weed control costs in the affected areas by approximately $45 million annually. Prolonged presence of excessive concentrations of atrazine in surface water supplies would most likely lead to label cancellation and withdrawal of the herbicide from current uses. A series of field trials were established to evaluate weed control efficacy and potential off-target runoff of atrazine from crop management practices including pre-plant incorporation and surface banding of atrazine, as well as alternative herbicides, transgenic technologies use and the use of grass filter strips. These trials clearly demonstrated that atrazine runoff could be reduced to acceptable levels while adequate levels of weed control were maintained by a combination of BMPs, without having to

remove the product from the market and causing economic damages to farmers. Numerous educational meetings communicated the off target atrazine runoff concerns and the efficacy of BMPs in dealing with them to area farmers. Due to these efforts, atrazine concentrations in the Marlin City Lakes system are now well below levels of concern and the lake is meeting water quality standards associated with atrazine. It has been removed from the 303(d) list for atrazine. Lake concentrations for atrazine in Big Creek Lake near Cooper, Texas has decreased from 3 ug/L in June of 1998 to below detection limits in June of 2003. The other Texas reservoirs (Bardwell reservoir, Lavon Lake, Richland-Chambers Reservoir, Lake Tawakoni, and Joe Pool) impacted by atrazine in this effort exhibit similar reductions in atrazine concentrations to levels of 1.0 ug/L or less for all water supplies in June 2003. This information will be crucial in moving to de-list these water supplies from the 2004 303(d) list. Finally, joint TAES-TCE watershed monitoring program for atrazine, simazine, metolachlor, and alachlor associated with the Lake Aquilla project, is showing reductions of atrazine in surface runoff associated with the establishment of cost-share BMPs in the watershed. This data combined with TCEQ water quality data associated with Lake Aquilla shows lake concentrations for atrazine in Lake Aquilla are now meeting water quality standards.

While somewhat dependent upon crop species and location; herbicides are the most widely used class of pesticides. The judicious use of herbicides reduces the expense of crop production by reducing tillage and labor demands; enhances crop yields by minimizing competition with weed species, improves crop quality by reducing foreign matter and moisture in the crop at harvest and reduces spoilage in post harvest storage. The adoption of transgenic crops by Texas farmers has met with a very wide acceptance. Texas Cooperative Extension in collaboration with TAES are largely responsible for disseminating information related to utilizing new weed management systems in an environmentally safe manner. In 1996, the first transgenic crops were commercially planted in the state. This amounted to less than 25,000 acres of soybeans, with no transgenic traits in cotton and corn. In 2003, it was estimated that 75% of the state's 250,000 acre soybean acreage was transgenic, 56% of the states 6 million acre cotton crop and 25% of the state's 2 million acre corn crop was transgenic. To accomplish this rapid large scale transition to genetically enhanced varieties, Extension faculty initiated approximately 300 weed management trials in 2003, as well as large scale plots in the Texas High Plains to compare the value and production expense of transgenic technologies in cotton. Hundreds of educational events were conducted which discussed the new technologies, utility of the transgenic traits in aiding insect and weed control, and potential drawbacks regarding technology fees, marketing and impact on yield and quality. The herbicide and insect resistance in these major field crops has significantly reduced crop production risk, allowing farmers to produce food, feed and fiber with less production expense, improved environmental quality by allowing farmers to use more environmentally benign herbicides as well as using thousands of tons less herbicides and insecticides, allowed the development of no-till and high residue conservation tillage crop production systems which reduce erosion, decrease consumption of fossil fuels, decrease production cost and improve wildlife habitats.

In South Texas, the Sorghum cropping systems program investigated alternative strategies for cropping systems management. Row spacing studies comparing 15, 19 and 20 inches showed significantly better yields compared to conventional row spacing (36, 38 and 40 inch row spacing). Plant populations of 50,000 and 70,000 plants/acre in coastal irrigated and dryland areas, respectively, significantly improved yields and profit margins. Studies also showed that Gaucho and Cruiser seed treatments and granular Counter provided net returns of

$42 to $69/acre through control of yellow sugarcane apid. Systemic insecticidal seed treatments improved crop returns from $2 to $24 per acre. Field studies of newly developed foliar micronutrient treatments increase grain yields by 16%, providing an $18.53/acre return above product and application costs. In the Rolling Plains, sorghum/cotton cropping systems that include interseeded rye were used to capture rainfall and produced yields of both crops which were well above long-term averages. In the Southern High Plains, rotation studies showed a 26% increase in lint yields with 19% less seasonal irrigation for sorghum-cotton rotations compared to continuous cotton.

Educational programming and collaboration between and among several agencies have been used to expand the use of nutrient management planning in crop production systems. This includes training programs for industry and consultants and efforts to enhance the adoption of soil testing as an important economic and environmental BMP. Examples of these programs include the following.

Field correlation studies to evaluate current soil test phosphorus recommendations were conducted across the state in both field and forage crops by TCE and TAES. At the same time, laboratory evaluations were conducted to compare alternative extractants for determination of soil test P. Joint efforts also were conducted with Oklahoma State, Louisiana State and the Noble Foundation to improve the strength and consistency of recommendations for agricultural producers. As a result of these efforts, the TCE Soil Testing Laboratory adopted the Mehlich III soil test extractant in 2003.

Texas Cooperative Extension, working with USDA-NRCS developed and implemented the Texas Certified Nutrient Management Planner program. The course and exam certify individuals affiliated with the government, private consultants and/or growers to develop nutrient management plans approved by state water resource agencies. The 4-day training event has been conducted 18 times at locations across Texas. To date, a total of 260 professionals have been trained, with 205 receiving full certification. All future new and revised state and federal conservation plans will be impacted by this program.

Nutrient management education for field and forage crop producers also was conducted through a series of 43 county and regional meetings and workshops which provided educational information and resources to over 8,800 producers in 122 counties regarding soil testing and nutrient management.

Soil Testing/ Nutrient Management Campaigns in the Blacklands, Coastal Bend and Lower Rio Grande Valley regions of Texas were conducted by TCE in cooperation with USDA-NRCS, Texas Commission on Environmental Quality, Texas State Soil and Water Conservation Board, and other agencies, as well as in cooperation with numerous commodity support organizations, including Cotton Incorporated. In one 4-county program conducted in the Lower Valley, 746 samples representing 38,000 acres (a 67% increase in the use of soil testing in the area compared to the previous year) were obtained. Results of the testing showed the potential for growers to reduce fertilizer applications by 869,883 lbs of nitrogen and 1,390,847 lbs of phosphorus compared to rates proposed before testing. In addition to the environmental benefits, the total economic impact for producers was estimated at $553,612 based on average per pound costs of nitrogen and phosphorus. Average per acre savings for major crops in the regions ranged from $11.64 to $25.53.

The Texas ryegrass-breeding continues to have a significant impact on the livestock industry in Texas and in Oregon. Several million lbs of TAM 90 are produced in Oregon and planted annually in Texas. Collaborative programs between TAES and TCE have shown that the

use of ryegrass in conjunction with winter annual legumes significantly lowers the winter feeding costs for cattle.

Emphasis in the forage improvement program is presently being placed on the development of forage cultivars which may also be used as food plots for wildlife. Efforts are underway to develop a new Lablab cultivar, a low coumarin sweetclover, cowpeas, and several new annual medics. The release of four bundleflower cultivars (Bedes 06, 08, 37 & 57) which will be marketed as a blend ('BeeWild') is anticipated to positively impact both livestock and wildlife industries.

Forestry research has focused on ecological, evolutionary and population genomics of conifers and other gymnosperm plants. The most important impact is on how forest genetics and breeding diverges greatly from its agricultural counterpart. This has implications for federal, state and corporate policy and public investment in research. Results from this research is being used to assist with climate change forecasts in the southern U.S. pine forests, and in developing an understanding of why the ancient conifer genome changes so little in comparison to flowering plants. This latter will be important in elucidating higher plant genome evolution. The tree growth rate research has immediate relevance to genetic gain per year in breeding programs for U.S. timber companies and researchers are working closely with commercial companies, Department of Energy and the USDA-Forest Service to transfer and implement this new technology.

Data on the 18,000-year ecological histories and unique generic descriptions of U.S. forests are being updated to include new information. Additionally, practical and effective silvicultural and management alternatives are being analyzed for restoring and sustaining pre-European settlement forests in the U.S. When complete, these descriptions and techniques can guide the management of protected forests, public working forests, and industrial forests. This research has led to the introduction of The National Historic Forests Act of 2001 (H.R. 2119) in the U.S. House of Representatives.

The Texas cowpea research program continues to develop pinkeye, blackeye, and cream varieties possessing improved plant architecture, high yield, and disease and drought resistance. The related program on mungbean continues developing improved varieties with synchronous flowering and improved yield and sprouting characteristics. The Texas mungbean release, 'TexSprout', is grown nationally and internationally. The program continues screening investigations for chlorosis in cowpea grown on high pH soils. About 200,000 pounds of seed of 'Texas Pinkeye Purple Hull', a variety developed by the Texas program, was sold in 2001, indicating that about 10,000 acres of this variety were grown.

The Texas potato improvement program has developed and released improved early maturing russet, yellow flesh, and red varieties adapted to Texas growing conditions, to enhance the competitiveness of the Texas potato industry. The program cooperates with the North Dakota, USDA/ARS Aberdeen, ID, USDA/ARS Madison, WI, USDA/ARS Beltsville, MD, Oregon, Colorado, and Minnesota breeding programs through exchange of first-year seedling tubers and/or advanced selections. Several Russet Norkotah Strains released in 1999 continue to gain favor across the U.S. This program is continuing investigations to identify varieties and species materials which are high in antioxidant compounds is ongoing. Virtually the entire russet potato acreage in Texas is now grown to improved Texas Russet Norkotah strains developed by the Texas Potato Variety Development Program. Due to the release of these strains and other varieties of the Texas program, average yields of the Texas summer crop lead the nation at 380 cwt compared with 200 cwt. for this crop in the 1970's.

Research on sweet potatoes, hybrid watermelons, triploid (seedless) watermelons has enabled both sweet potato and watermelon producers to stay abreast of new genetic material that is adaptable to East Texas growing conditions. Due to the ongoing watermelon studies, the East Texas area has become one of the major production areas in the nation, especially in seedless production. The use of plastic mulch and drip irrigation with these studies has shown how the use of chemicals for weed control can be greatly reduced while conserving water and increasing yield.

The peanut industry is demanding high O/L peanuts for improved flavor and shelf-life of peanut products in the U.S. marketplace. The release of three new peanut cultivars, OLIN and Tamrun Ol01 and Tamrun OL02 is having a huge impact on the Texas peanut industry. In 2003, yields of Tamrun Ol01 approaching 5,000 lbs/ac were recorded in south Texas. The success of this variety is directly responsible for the anticipated increase in acreage of peanuts in south Texas in 2004.. A conservative estimate of value for these lines (increase over present varieties) to Texas Peanut Growers is as much as $20 million per year after the seed increase generations have been completed.

Competition among cotton producers in a global market and a decreasing genetic base make it imperative that cotton be improved for Texas' producers. About 15 varieties are commercially available that contain germplasm from the Texas program, and significant improvement in fiber quality of cotton produced on the Texas High Plains has placed Texas cotton in demand by the textile industry. The quality of our cotton ranks second only to California. The high quality germplasm released from the Texas program for use in varietal development has improved the selling price from 2 to 5 cents per pound of lint.

Sorghum breeding efforts released multiple germplasm's (Tx2912 to Tx2920 and Tx2921 to Tx2928) and one parental line (RTx437) to the sorghum industry. Current emphasis in the program currently focuses on the selection of medium maturing tan plant germplasm with high yield potential and lodging resistance. Research on grain quality, grain yield and disease resistance support the breeding efforts. A collaborative effort between TAES and USDA-ARS to map of grain yield QTL is complete, and analysis is underway in two different populations for grain mold resistance and anthracnose resistance genes. This project is enhancing the productivity and value of grain sorghum, and will eventually make significant improvements in grain quality, yield and disease resistance.

Texas corn breeding programs released multiple germplasm's (Tx732, Tx745, and Tx745) and parental lines (Tx110, Tx772, Tx802 and Tx803) to the corn industry. Corn improvement efforts in Texas are targeting drought resistance, disease resistance (i.e. mycotoxins), improved quality (i.e. high lysine) as well as the introgression of traits from tropically adapted corn into temperate corn germplasm. Because of their unique geographic location and proximity to Mexico, these programs have the potential to serve as the conduit for the introgression of novel traits into U.S. corn germplasm.

Researchers breeding for leaf rust resistance in wheat are getting their resistance genes from wild wheat relatives. Resistance found is effective over a wide range of environments throughout the United States, and progress was made in combining different genes for leaf rust resistance into single genotypes of wheat. Two new triticales (TAMcale 5019 and TAMcale 6331) and three wheat varieties (Sturdy 2K, TAM 111 and TAM 110CL) were release this year. A new program targeted at introgressing heat tolerance conferred by Australian, Israelei, and CIMMYT varieties is being introgressed into adapted Texas germplasm. These breeding lines and varieties are permitting producers in the southern plains of the United States to grow high-

yielding, disease resistant small grains, and are estimated to save producers $2-to-3 million per year. Competition among cotton producers in a global market and a decreasing genetic base make it imperative that cotton be improved for Texas' producers. About 15 varieties are commercially available that contain germplasm from the Texas program, and significant improvement in fiber quality of cotton produced on the Texas High Plains has placed Texas cotton in demand by the textile industry. The quality of our cotton ranks second only to California. The high quality germplasm released from the Texas program for use in varietal development has improved the selling price from 2 to 5 cents per pound of lint.

It should be noted that the crop improvement programs conducted by TAES represent a partnership with TCE specialists and county agents, farmers, consultants, and agribusiness in Texas as the germplasm, parental lines, and varieties which are ultimately released are tested statewide prior to release. Grain sorghum and cotton in the Texas Coastal Bend area that yield of grain sorghum may be sustained better using lower plant populations (30,000 to 40,000 plants/ac in 38 in.-rows) under severe dryland conditions. Cost of production is also lowered using lower plant populations (60,000 plants/ac) under irrigated conditions. Grain sorghum yields are dramatically increased (20-25%) using narrow rows (double rows 12" apart in 38 inch beds) under irrigated conditions. Double rows also increase yields under mild dryland conditions. Lower planting populations (30,000 plants/ac in 38"-beds) also sustain yields better in cotton compared to higher populations normally used by farmers in South Texas.

C. Source of Federal Funds
   TCE: Smith-Lever and state matching
   TAES: Hatch, and state, federal and private contracts and grants

D. Scope of Impact
   Multi-State Extension - OK, KS, GA, MS, AR, TN, KT, NM
   Multi-State Research - AL, AR, CA, LA, MO, MS, SC, CO, ID, ME, MI, MN, ND, OR, WA, NE, NM
   Integrated Research and Extension
   Breeders work closely with their extension counterparts in the field trials and evaluation of new cultivars, varietal plantings and demonstrations of advanced lines for county agents, farmers, and specialists.

State TCE-TAES Plan of Work Program 3: Livestock Quality and Profitability

Key Theme: Agricultural Competitiveness, Agricultural Profitability

A. Description of Activity

Texas ranks first in the nation in total livestock value and also has the broadest spectrum producers and variation in production environments. High production costs and variable sale receipts for all livestock species necessitates adoption of best management practices to efficiently produce livestock and their resulting end-products that are cost-competitive with consumer alternatives while meeting the food quality and safety standards expected by our society. Educational programs are needed to increase producer awareness of consumer concerns and implementation of advancements in research proven production practices and developments in technologies to meet those needs while increasing net returns from livestock operations.

B. Impact of Programs

Research and education programs will focus on livestock genetics, nutrition, reproduction, cost effective best management practices and how producers can increase profitable production efficiency while still producing high quality, safe, wholesome end products. Specific livestock recommended management practices in selection, nutrition, reproductive physiology, health, and meat science will be emphasized. Other factors that influence product acceptability in the market such as marketing methods and food safety issues will be stressed. The target audience is composed of beef cattle, equine, dairy, sheep, goat and swine producers, commodity group leadership, Extension educators and youth enrolled in 4-H and F.F.A. livestock projects. Partnerships have been established with CSREES, Texas A&M College of Veterinary Medicine, TAMU College of Agriculture and Life Sciences Departments (Ag Economics, Ag Engineering, Entomology, Rangeland Ecology and Management, and Soil and Crop Sciences), Texas Tech University, West Texas A&M University, Oklahoma State University, Texas Beef Council, Texas Cattle Feeders Assn., Independent Cattlemen's Assn., Texas Association of Dairymen, Texas Pork Producers Assn., Texas Sheep and Goat Raisers Assn., and Texas Farm Bureau.

TAGS (Texas Adapted Genetic Strategies), an Extension beef herd genetic training program compliments research in bovine genetic mapping. Genetic research on susceptibility to disease is a problem for animal production and has enhanced the Extension Beef Quality Assurance health management practices education component. Texas researchers have addressed this need using high resolution, ordered comparative maps of bovine chromosomes relative to the chromosomal maps of humans and mice and to provide biological reagents for bovine genome mapping to the research community. Already, they have placed 2000 conserved markers on an ordered radiation hybrid map of the bovine genome. All have known map positions in the human genome. This map has been completely integrated with the bovine linkage map.

Texas Beef Quality Producers have been certified through Extension BQA training emphasis on food production safety resulting from efforts in the validation and verification program of beef carcass decontamination collaborative research involving Extension specialists, scientists, and classroom educators to implement a stepwise process to determine industry decontamination procedures and parameters currently in use. Cattle at the same facilities are sampled for the presence of Escherichia coli O157:H7 and an indicator bacteria. Laboratory

testing of decontamination procedures is conducted according to industry parameters, and verification of pathogen reduction is tested in the laboratory followed by implementation in the industry. Educational materials, including an interactive CD, are being used by personnel in this work, and are included in formal university courses and industry-appropriate workshops. This work is providing a logical outline of microbiological data collection from the beef industry, combined with extensive laboratory studies to investigate the possibility of using non-pathogenic bacteria for validation and verification of decontamination critical control points in slaughter processing. Ultimately, the resulting educational materials and programs will be used by both industry and in formal university courses.

Three thousand (3,000) beef industry leaders have participated in Beef 706 to learn more about what creates value in beef carcasses and ways they can change management practices and genetics to enhance carcass value and increase the wholesomeness and safety of their beef product. Seventy-eight percent (78%) indicated they would make different business and safety decisions in their ranching operation as a result of participating in this educational program and 100% said they would recommend attending 706 to other beef industry members.

Two thousand (2,000) producers from 10 states have evaluated 20,000 head of calves in the Texas A&M Ranch to Rail program to learn more about how their calf crop fits the needs of the beef industry and the traits that create value in beef marketing. They learned that they could increase their net return per head from $50 to $100 through retained ownership. They also learned that an effective health vaccination and weaning program at the ranch of origin reduced bovine respiratory disease at the feedyard to reduce production costs by more than $90 per head.

The database on the 20,000 entries in Ranch to Rail revealed that administration of specific viral vaccines, and the timing of their administration and the days weaned prior to marketing greatly impact production efficiency and carcass quality. The outcome of this result led to development of the Value Added Calf Vaccination Management program (VAC). The four largest cattle marketing organizations in the state have adopted the VAC guidelines and have special feeder calf sales that have resulted in increased values for ranches in excess of $70 per head due to industry demands for healthier cattle.

The Annual TAMU Beef Cattle Short Course has hosted 20, 700 beef cattle producers since 1990, averaging approximately 1,500 participants annually. The attending beef producers mirror the Texas beef producers' demographics related to herd size, number of ranches, acreage, producer characteristics, etc. Each annual survey indicates the attendees rank the 2.5 day conference as 86% excellent, 14% average, and no poor evaluations. The majority of participants (90%) indicated learned management practices would be adopted, amounting to $80 net value increase per head in the operation or approximately and increase of over $5,000 annually for the average sized beef operator. Ninety-eight per cent of the participants stated they would continue to use the TAMU Beef Cattle Short Course for future information on beef cattle production.

The Texas Pork Quality Assurance Youth Program was created and a curriculum was developed to educate the 26,000 youth swine project exhibitors annually at livestock shows on food and pork quality wholesomeness. More than 500 County Extension Agents and Vo-Ag instructors have been trained to deliver the curriculum. The National Pork Board has adopted the curriculum and created a handbook distributed nationally.

Equine research in exercise physiology, nutrition and reproduction results have boosted the $11 billion Texas horse industry income to producers through using the findings in producer training courses like the Extension Mare Foal Clinics, Feed Industry Workshops, and New Owner Workshops attracting participants owning over 10,000 horses since 1997. The Extension Horse Theft Prevention Workshop alone has reached over 40,000 horse owners since 1998.

Collaborative reproductive performance research results and Extension demonstrations involving beef cattle herds indicate use of artificial insemination, selected and short calving seasons, and breeding soundness evaluation of bulls can easily interpret into an increased $100 per head of exposed cows in the beef herd.

Dairy specialist's research helped repeal the proposed law opposing the use of cooling ponds for dairy producers saving Texas producers $792,000 annually. Sheep/goat specialists and researchers through "hair sheep" research and recommendations to non-traditional sheep and goat producing areas such as east Texas can solve the decline in sheep numbers and save an industry.

Output Indicators:

The total number of people completing non-formal educational programs to improve the production efficiency and end product quality of livestock products was 3,840.

Total number of people completing these non-formal educational programs to improve the production efficiency and end-product quality of livestock products who plan to adopt one or more production practices or management strategies after completing strategies after completing these products was 3,400.

3,840 Number of Participants Served by Group Methods

1,400 Number of Participants Served by Individuals Methods

20,000 Number of Participants Served through Mass Media

201,000 Number of Participants Served through web site Access

Outcome Indicators:

The total number of people completing these non-formal educational programs who actually adopt one or more new practices or strategies taught at these programs within six months.

Data not collected at this time.

C. Sources of Federal Funds

TCE: Smith Lever and State Matching

TAES: Hatch, and state, federal and private contracts and grants

D. Scope of Impact

Multi-State Extension * OK, AR, LA, TN, FL, and NM

Multi-State Research * Multi-State Project NRSP-8 (IL)

Integrated Research and Extension: Extension faculty worked with research scientists to identify technologies that could enhance production efficiencies, improve data collection and optimize meat quality. Research on electronics and its adaptation to livestock production was implemented. Electronic individual ear tags were used in Ranch to Rail to facilitate computer-assisted data collection. Also, ultrasound technology developed by researchers was used to determine body composition as it relates to carcass quality. Research faculty updated producers in Beef 706 on how electrical stimulation of carcasses and controlled aging can be used to improve tenderness of retail cuts.

Goal 2: A safe and secure food and fiber system

Overview

The Centers for Disease Control and Prevention estimate that food borne diseases cause 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year. More vulnerable populations for food borne diseases include the very young, the elderly, and immunocompromised individuals. National medical costs and productivity losses associated with food borne diseases are estimated in the billions of dollars each year, and in Texas, the costs are in the millions of dollars annually.

More than half of all food borne illnesses are attributed to improper food handling in restaurants. Because 43-50% of all food dollars are spent on food prepared outside the home, food safety is a top concern among consumers. Therefore, food safety education is critical to help reduce the risk for food borne diseases.

To meet the need for quality food safety education in Texas, programs on safe food handling and food borne diseases were conducted by county Extension agents using materials developed by Texas Cooperative Extension, called *Food Safety: It's Our Business*. Professional development in the area of food safety was provided or facilitated for those county Extension agents who chose to provide the program.

Programs in the areas under Goal 2 continue to develop and provide research-based information to commercial food handlers, food service and child nutrition directors in public schools, the medical community, corporate food companies, as well as lay citizens in the state. Educational programs are designed in order for participants to make sound decision on the implementation of best management practices and adoption of recommended food safety practices. Educational programming has been and will continue to be driven by the needs of our clientele. Results from the Texas Community Futures Forum, and guidance from Executive Program Councils and program committees, and representatives from major medical and industry groups serve as the basis for this strategy.

The TCE/TEAS data presented in this summary and the following section represents the efforts of 2003. Research and educational programming efforts have been ongoing for many of the areas represented and continue to provide Texas food service managers, food service handlers, processors, and other industries with opportunities for increased food safety knowledge and skills. Future plans will build on past experiences and emerging issues that may affect our state and clientele.

Sources of TCE-TAES Funding and FTEs

TCE: Smith Lever and State Matching

		$ X 1000 Actual FY 2003
Program 4 – Food Protection Management		687
	FTEs	31.45
Allocated Resources Goal 2		1,190
	FTEs	55.48

TAES: Hatch, and state, federal and private contracts and grants

Source of Funding and FTEs

Federal Funds ($ x 1000):	256
State Funds ($ x 1000):	692
FTEs:	7.38
Number of Projects:	44
Number of Publications:	95

State TCE-TAES Plan of Work Program 4: Food Protection Management
Key Theme: Food Handling, Food Safety, and Food borne Illness

A. Description of Activity

Background. The Centers for Disease Control and Prevention estimate that food borne diseases cause 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year. More vulnerable populations for food borne diseases include the very young, the elderly, and immunocompromised individuals. Medical costs associated with food borne diseases are estimated between $3-7 billion dollars each year, with productivity losses between $20-40 billion dollars.

More than half of all food borne illnesses are attributed to improper food handling in restaurants. Because 43-50% of all food dollars are spent on food prepared outside the home, food safety is a top concern among consumers. Therefore, food safety education is critical to help reduce the risk for food borne diseases.

To meet the need for quality food safety education in Texas, programs on safe food handling and food borne diseases were conducted by county Extension agents using materials developed by Texas Cooperative Extension, called *Food Safety: It's Our Business*. Professional development in the area of food safety was provided or facilitated for those county Extension agents who chose to provide the program. Educational lessons and activities of the program focused on the following areas:

- Enhanced use of temperature control measures in food service, such as thermometer use, time and temperature control, safe internal cooking and holding temperatures, thawing procedures and general storage temperatures.
- Increased adoption of proper hygiene and hand washing practices of food service employees and managers.
- Increased adoption of practices to avoid cross-contamination such as proper storage, washing and sanitizing of utensils and equipment between use, and employee hygiene practices.
- Improved knowledge and practices in purchasing and accepting safe food.

Target Audience for Food Protection Management Program. The target audiences for this educational program were primarily food managers in food service institutions, companies, and small privately owned foodservice businesses who needed or desired training. These contacts included those in both urban and in the under-served rural areas of the state where public health oversight is limited. Care was given to meet the geographically disadvantaged.

Linkages. Linkages included the following: private sector partnerships, corporate industries such as fast food chains and bed and breakfasts, and food distributors. Interagency cooperators included the Texas Department of Health, local public health jurisdictions and trade organizations such as restaurant and convenience store associations.

B. Impact of Program

Output Indicators:

In 2003, a total of 127 two-day certification short-courses and 33 one-day certification short-courses were conducted by county extension agents throughout the state. In addition, 153 certification opportunities with participants taking a certification test only were provided at local county extension office sites. A total of over 3,200 food managers participated in *Food Safety: It's Our Business* trainings and another 500 took the certified food manager examination through local Texas Cooperative Extension offices. Of these food service managers and employees, 88% were from underserved rural areas of the state where public health oversight is limited.

Through a train-the-trainer approach, these foodservice managers in turn have provided food safety training to their employees. Through this program, Texas Cooperative Extension outreached to approximately 35,000 foodservice employees.

Outcome Indicators:

After participating in *Food Safety: It's Our Business,* food managers were expected to train their employees in safe food handling practices. A statewide telephone survey of a random sample of individuals (n=400) who participated in the FPM certification course was conducted to determine the practices of food managers and their employees both before and after they had taken the course. This retrospective survey assessed critical behaviors based on those identified by Medeiros et al. (2001) and included three items related to cooking foods adequately, three items related to practicing personal hygiene, three items related to avoiding foods from unsafe sources, three items related to avoiding cross-contamination, and five items regarding keeping foods at safe temperatures. In addition, this survey also assessed participants' food safety teaching behaviors and their perceptions of their understanding.

Significant improvements were noted for each of the five behaviors (Table 1). In addition, significant improvements ($t=-15.76$, $p<0.01$) were noted in the amount of food safety education provided by the participants to their employees. Mean score of the amount of education provided before attending *Food Safety: It's Our Business* was 12.02 (SD=3.46) compared to the mean score after of 14.88 (SD=2.04). Participants also felt they had significantly improved understanding of food safety concepts from before (mean=7.33, SD=3.46) to after (mean=8.66, SD=1.02) the training ($t=-14.35$, $p<0.01$). Importantly, 75% of the participants indicated that they had never participated in any other food safety educational program. In addition, this survey indicated that 96% of the participants had shared the information gained from the course with their employees.

Table 1

Paired Samples T-test of the Cooking, Personal Hygiene, Food Sources, Cross-contamination, and Temperature Storage Practices of Food Managers in Texas Before and After Participating in Food Safety: It's Our Business Training

Food safety practice	Mean Score		*t*	*p*
	Before:	After		
Using thermometers and other control measures to keep food at safe temperatures.	9.26 ±3.19	10.00 ±2.68	-3.82*	<0.01
Training employees to practice proper personal hygiene.	10.09 ±1.78	10.36 ±1.25	-2.90*	<0.01
Adopting practices to prevent cross-contamination.	13.94 ±3.61	14.54 ±2.77	-3.46*	<0.01
Cooking food to a safe minimum internal temperature.	8.65 ±4.21	9.28 ±3.71	-3.26*	<0.01
Avoiding food from unsafe sources.	8.72 ±3.31	9.64 ±2.34	-4.76*	<0.01

Note. * indicates significant differences.

Impact of Program:

Because of the rising incidence of food borne diseases in the United States and Texas, Food Protection Management programs are of vital importance. However, these trainings are unavailable to many food service managers and employees in rural areas. TCE has successfully provided these programs to over 3,200 managers in underserved rural areas of the state where public health oversight is limited.

The results of the Food Protection Management survey indicated that for 75% of the respondents, this program was the first food safety course they had taken. Almost all (96%) of the managers who participated in the training indicated that they shared the information with their employees to increase safe food handling techniques in their establishments.

Other efforts in this area have centered on providing food safety and food protection management to other audiences. Efforts of several efforts are provided below.

Institute of Food Science & Engineering Advisory Council. The 2001 Gross Domestic Product of the US included $141 Billion accounted for by production Agriculture, forestry and fishing combined. The value-added food industry accounted for an additional $124 Billion of our GDP. This value-added food sector is a critical stakeholder to our Agribusiness Programs spanning Agriculture and the Life Sciences. Stakeholders critical to the success of the value-added food industry in Texas and the nation give clear insight as to value and direction of our programs and activities.

The Institute of Food Science and Engineering operates an Advisory Council that is designed to pull stakeholders together on a regular basis and solicit review and comment on food research and outreach programs of the Institute. In particular the council seeks ways to link the two into a harmonious effort. This Advisory Council program supports the efforts of the Institute by contributing to a semi-annual review of activities, strong interaction with university administration and providing partnerships and insights with major corporations and government agencies.

The program seeks to bring influential and leading stakeholders into the program planning and design process for the institute planning and operations. The council is made up of 32 members with 1/3 assigned to university leaders and 2/3 assigned to external participant. There are 4 seats assigned to government representatives and the remainder of the external participants are requested from food industries and related organizations.

This program links specific corporations with the TAMU Institute of Food Science & Engineering. Since the Institute is a cross college system entity, we directly connect faculty in 4 colleges; Agriculture & Life Sciences, Science, Engineering and Veterinary Medicine. Other linkages include the Texas Engineering Experiment Station. The Institute brings faculty in 6 centers into close planning and involvement: Center for Food Process Engineering, Center for Food Safety, Center for Nutrition, Health and Food Genomics, Center for Consumer & Food Marketing Issues and the National Center for Electron Beam Food Research.

This advisory council program brought internal TAMU leaders from very diverse disciplines to our council for input and guidance. Current leaders represent the following academic disciplines: Soil and Crop Sciences, Texas Water Resources Institute, Biological and Agricultural Engineering, Veterinary Anatomy and Public Health, Poultry Science. External leaders include four key agencies: U.S. Food and Drug Administration, U.S. Department of Agriculture, Texas department of Agriculture, and the Texas Department of health.

Among the external council members are leaders from the following organizations: Sun Orchard, Inc., Wal-Mart, Inc., Frito Lay, Inc., Genecor, Inc., R.E. Smith, Inc., Sysco Foods, Inc., Nagle Resources, Inc., Heritage Family Specialty Foods, Inc., Texas Beef Council, Avendra, H.E. Butt, Better Built Foods, Research Valley Partnership, Con Agra Foods, Canadiauga Wines, C.F Chefs, Technical Products, Inc., and Tragon Corp.

Institute of Food Science & Engineering Texas Science Partnership. Linking research with real world problems and challenges with faculty capacity in research and outreach motivated the IFSE develop the Texas Science Partnership. Food companies worldwide face similar challenges: balancing the need to stay ahead of the competition with the risk of investing heavily in research & development and as companies expand in technology, they continually face the issue of communicating their advances to the consuming public and others. Helping companies meet these challenges is the goal of the Texas Science Partnership (TSP).

The TSP is a membership fee activity where companies pay to sustain a communications and partnership program. The program is designed to share research and outreach efforts between faculty at TAMU and member companies.

TSP offers companies the opportunity to collaborate with Texas A&M scientists who conduct research and outreach in food technology. The companies that participate in the TSP have access to the more than 150 faculty at the Institute. These faculty represent diverse academic disciplines and a wide array of research and outreach interests.

For example, they can address critical issues such as fundamental mechanisms of chemical interaction and appropriate responses to spoilage/food-borne disease outbreaks. TSP makes this type of technical knowledge accessible to industry. And, through university/industry collaborations, member companies can pursue novel ideas that hold promise but represent an expensive or risky investment.

The Institute offers TSP members the opportunity to discuss ideas and solutions with some of the best food scientists in the world. The knowledge base and research facilities at the Institute will extend the technical resources of participating companies, providing a well-needed competitive edge.

Currently ten corporations are represented in the Texas Science Partnership. These Companies include: FMC Food Tech Inc., Frito Lay Inc., Kal Kan Pet Care, Lynntech Inc., Naturis, Praxair food Technologies, 3M Microbiology, Warnex Corp., and Siliker Laboratories Inc.

These corporations send their chief science officer to represent them during the TSP meetings which occur every fall and spring.

Outreach Education of the National Center for Electron Beam Food Research. On May 29, 2003 - The U.S. Department of Agriculture approved and released specifications for the purchase of irradiated ground beef through the National School Lunch Program. Irradiation is marketed as an added food safety step, though it is actually the only real "kill" step for food-borne pathogens such as E. coli O157:H7 and Salmonella in ground beef. The product will be available for schools to order in January 2004.

U.S. schools feed 24 million children per day so food safety is top of mind for school foodservice staff in 95,000+ schools across the nation. According to the Center for Disease Control, from 1998-2000, 3% of food-borne illness outbreaks and 10% of all food-borne illness cases requiring hospitalization originated from school foodservice prepared meals. CDC records indicate that on average 14 Americans die each week from food-borne illness.

Extension faculty have hosted foodservice & child nutrition directors representing more than 200 of Texas' 1,256 school districts in regional train-the-trainer event in Houston, Irving, San Antonio, El Paso, Dallas, and Fort Worth. Texas school officials voice concerns for 1) the safety of school-prepared foods and 2) product liability of the school preparing foods that might lead to food-borne illness.

Pre and post surveys were collected for three of the four conferences held in metropolitan areas with 105 respondents. These surveys indicated significant positive increases in beliefs of the school foodservice directors/managers/dietitians. Specifically their beliefs about the safety of irradiated products, their willingness to purchase irradiated foods, and their confidence in communicating about food irradiation to others, including their administrators improved. A significant increase in knowledge about food irradiation was also noted.

Institute of Food Science & Engineering Outreach to Allied Disciplines. The Texas Medical Association appointed a 13 member Blue Ribbon Task Force on Genetically Modified Foods to encourage discussion and debate about the risk and benefits of consuming these foods based on current scientific literature. The Institute of Food Science & Engineering Associate Director for Outreach served on the TMA committee upholding the value of science in our policy and opinion making.

By partnering with the medical establishment, the Institute attested to the critical linkage of food-diet-health. This linkage is a critical one for the future where we see the tie between the quality of our food supply becoming critical to the value of our diet. And the value of our diet will become instrumental to our short term and long-term health issues. The Texas Medical Association appreciated the linkage with Texas Cooperative Extension.

TCE faculty co-edited Task Force on Genetically Modified Foods Report of Findings (2002). The results were delivered to the 37,000 members of TMA the following recommendations of the Task Force.

- No scientific evidence has been published that shows genetically modified foods released to market are unsafe to eat.
- Genetically modified foods should continue to be studied and monitored for safety.
- Consumers need to have access to credible and scientifically reliable information on genetically modified foods.
- Currently, institutional and commercial practices and agreements may impede sharing of research results, which slows scientific progress. More effort needs to be made on sharing genetic research data.
- Innovative partnerships between public and private entities should be created to encourage the ethical sharing of scientific research findings.
- Rigorous, effective and comprehensive governmental oversight is essential to the development of genetically modified products to ensure the highest level of public health safety.
- The risks of any genetically modified food — including the long-term effects of changing plant, bacterial, viral, and fungal flora — must be weighed against the benefits that any new food has to offer.
- For consumers to have confidence in genetically modified foods, they must see that the benefits outweigh the risks; such education must be made available in a non-biased, scientific way.

C. Source of Federal Funds

TCE: Smith-Lever and State Matching

TAES: Hatch, and state, federal and private contracts and grants

D. Scope of Impact

Multi-State Extension - Multi-State projects include working with Colorado, Ohio and Washington to develop program indicators.

Multi-State Research – Multi-State Project W-195

Integrated Research and Extension: Integrated Research and Extension include working closely with professors in the Department of Food science and Technology, Animal Science, and the Department of Food Science and Engineering on projects such as the food safety, HACCP, genetically modified foods, and programs for delivering a safe reliable food supply continue the focus of this highly integrated program..

Goal 3: A Healthy, well-nourished population

Overview

The TCE-TAES Programs under Federal Goal Three cover the areas of General Health Education, Diabetes Education, and Better Living For Texans.

General Health Education. General health research and education programs are represented by the Walk Across Texas, the Rural Passenger Safety Project, and the Cancer Risk Reduction for Rural Texans program and efforts of the Vegetable and Fruit Improvement Center. These programs, with the exception of the Rural Passenger Safety Project, are designed as to promote the prevention chronic diseases or to reduce the impact of chronic diseases such as heart disease, stroke, cancer, and diabetes. Prevention and reducing impact of these very costly diseases is extremely significant. The Rural Passenger Safety Project is designed to provide a safe environment for children and adults using our roadways.

According to the 1996 Surgeon General's Report, 60% of adults are not physically active, and 25% do no physical activity. In addition, nearly half of American youth are not physically active on a regular basis. Adequate physical activity lowers risk and improves management and outcomes for leading causes of death including heart disease, hypertension, stroke, and diabetes. This program is aimed at helping participants establish the habit of physical activity with support from their peers. County Extension agents in 88 counties across Texas organized teams of eight people to keep a record of miles they walked during eight weeks. Teams competed with one another to walk across the state first and/or accumulate the most mileage during the eight weeks. Team members could also attend classes and receive information on nutrition, exercise, weight loss, and other health topics like arthritis and diabetes.

Based on a study conducted by the National Highway Traffic Safety Administration, at least 80% of all child safety seats are used incorrectly. The long-term goal is to reduce child passenger fatalities 25% by the year 2005. Motor vehicle accidents are the leading cause of death for children. Certified child safety seat technicians provided child safety seat checkup events where parents learned how to correctly select and install safety restraint systems for their children. Technicians demonstrated the correct installation in parents' vehicles in rural counties across Texas.

Cancer Education. Cancer is the second leading cause of death in adults over 40 years of age. Survival is improved when early detection is sought. The risk for cancer can be reduced with lifestyle improvements such as not using tobacco and reducing unprotected sun exposure. Rural populations in Texas are more at risk for death from cancer because 30% are over 65 years old and accessing both knowledge regarding early detection and medical care are difficult. This project particularly targets people working in agriculture --a group with a high incidence of skin cancer because of high levels of sun exposure as they go about their daily work. Extension agents were provided training and educational resources focused on early detection and risk reduction for cancer. Agents used these materials at a variety of events including fairs, livestock shows, Texas Extension Educators Association meetings, civic club meetings, 4-H meetings and events, camps, and many other events in their counties. Volunteers were trained to use flip charts containing narratives and pictures to inform community groups how to prevent skin cancer.

Lifestyles and eating habits have resulted in a major increase in the incidence of diet-related diseases. This has serious implications for the individual, family and the overall economy. There is an increasing focus on preventing diseases through diet rather than curing diseases with drugs and surgery. TAES and TCE have an integrated program designed to have

maximum impact across Texas and the nation. A component of the overall approach includes the Vegetable and Fruit Improvement Center (VFIC), a research and extension concentrated effort to address diet and health. This center working with scientists from the state's top medical centers, have devised and implemented a research and education plan that will not only make fruits and vegetables more healthful for people to eat but also economically strengthen the total produce industry. The FVIC is organized with industry partners which fund a part of the research and graduate assistantships. There are 42 partners located in eight states, the U.S. and Germany and include seed companies, grocery stores, restaurants, grower/shippers, national associations, nutraceutical companies, processors, and individuals.

Diabetes Education. Diabetes is a significant problem affecting ~920,000 Texans who know they have the disease and another 680,000 Texans are undiagnosed. Failure to control blood glucose levels to prevent long term complications results in increased health care costs, increased loss of time from work due to illness, amputations, poor health status leading to decreased quality of life. Education is the single most important thing people with diabetes can do to improve their health status and prevent the onset of complications. Additional benefits possible might be that health care insurance costs could decrease by controlled blood glucose levels through proper nutritional management and increased exercise resulting in fewer chronic complications, less time lost from work due to better nutrition practices and self-care health management, and reduction in long term illness and health care costs. Extension diabetes programming efforts educated clientele in 2,701 programs with 26,298 group contacts and 60,245 individual contacts with approximately 60 percent representative of underserved populations. In the previous three years, county programs attracted more than half of consumers with diabetes and health professionals in an average of 126 Texas counties.

Better Living for Texans. An estimated 14.7% of Texans live in poverty. Research suggests that individuals who live in poverty consume diets that are not in agreement with the Dietary Guidelines for Americans and the Food Guide Pyramid. In addition, the diets of individuals in low-income households are often deficient in fruits, vegetables, and dairy products. This is due, in part, to a lack of knowledge and an inability to purchase and prepare healthy foods on limited budgets. Individuals who live in poverty are also at risk for being food insecure. This means that the ability to acquire safe and nutritious foods is limited or uncertain. In 2002, the USDA reported that nearly 15% of Texas households had experienced food insecurity during the previous 12-month period. A recent survey of 1,000 households participating in the Food Stamp Program throughout Texas found that more than half of those households had experienced food insecurity or hunger within a 12-month period.

Programs in the areas under Goal 3 continue to provide citizens of Texas with research-based information in order for them to make sound decision on the implementation of best management practices, adoption of technologies, and behavior changes to improve the quality of life. Educational programming has been and will continue to be driven by the needs of our clientele. Results from the Texas Community Futures Forum, and guidance from Executive Program Councils and program committees serve as the basis for this strategy.

The data presented in this summary and the following section represents the efforts of Year 03 of this Plan of Work. Educational programming efforts have been ongoing for many of the areas represented and continue to provide Texans with opportunities for increased health and well-being. Future plans will build on past experiences and emerging issues that may affect our state and clientele.

Sources of TCE-TAES Funding and FTEs
TCE Funding: Smith Lever and State Matching

		$ X 1000 Actual FY 2003
Program 5 – General Health Education		997
	FTEs	29.53
Program 6 – Extension Diabetes Education		525
	FTEs	24.21
Program 7 – Better Living for Texans		490
	FTEs	22.46
Total TCE Allocated Resources Goal 3		**2,071**
	FTEs	**96.59**

TAES Funding: Hatch, and state, federal and private contracts and grants

Source of Funding and FTEs

Federal Funds ($ x 1000):	187
State Funds ($ x 1000):	748
FTEs:	9.94
Number of Projects:	33
Number of Publications:	80

State TCE-TAES Plan of Work Program 5: General Health Education
Key Theme: Human Health

A. Description of Activity

Walk Across Texas. According to the 1996 Surgeon General's Report, 60% of adults are not physically active, and 25% do no physical activity. In addition, nearly half of American youth are not physically active on a regular basis. Adequate physical activity lowers risk and improves management and outcomes for leading causes of death including heart disease, hypertension, stroke, and diabetes. This program is aimed at helping participants establish the habit of physical activity with support from their peers.

County Extension agents in 88 counties across Texas organized teams of eight people to keep a record of miles they walked during eight weeks. Teams competed with one another to walk across the state first and/or accumulate the most mileage during the eight weeks. Team members could also attend classes and receive information on nutrition, exercise, weight loss, and other health topics like arthritis and diabetes.

Participants track their progress on-line at http://walkacrosstexas.tamu.edu, a data collection web site developed during 2002. They are able to immediately receive feedback on their progress towards increasing their physical activity. Participants may see how their individual or team progress compares to others in their groups. Participants compete within groups such as their own work sites or schools, thereby enhancing peer support for accomplishing their goal of increased activity. The website has enabled the implementation of this program in major metropolitan areas this year, including Houston, Dallas and Ft. Worth.

Internal linkages have been formed with Agricultural Communications, Foods and Nutrition, and Extension Information Technology. External linkages include families, schools, work sites, families, neighborhoods, churches, and civic clubs participated. Almost one-half of the teams continue to come from work sites. County agents reported collaborating with local health departments and a number of other agencies like parks and recreation and senior centers. Other states including Tennessee, Idaho, Kansas, Arkansas, Louisiana, Kentucky, Alabama, and Illinois have requested the manual to adapt this program for their states.

Rural Passenger Safety Education. Based on a study conducted by the National Highway Traffic Safety Administration, at least 80% of all child safety seats are used incorrectly. The long-term goal is to reduce child passenger fatalities 25% by the year 2005. Motor vehicle accidents are the leading cause of death for children.

Certified child safety seat technicians provided child safety seat checkup events where parents learned how to correctly select and install safety restraint systems for their children. Technicians demonstrated the correct installation in parents' vehicles in rural counties across Texas.

External collaborations included the Texas Department of Public Safety troopers and Texas Department of Transportation.

Cancer Risk Reduction for Rural Texans. Cancer is the second leading cause of death in adults over 40 years of age. Survival is improved when early detection is sought. The risk for cancer can be reduced with lifestyle improvements such as not using tobacco and reducing unprotected sun exposure. Rural populations in Texas are more at risk for death from cancer because 30% are over 65 years old and accessing both knowledge regarding early detection and medical care are difficult. This project particularly targets people working in agriculture --a

group with a high incidence of skin cancer because of high levels of sun exposure as they go about their daily work.

Extension agents were provided training and educational resources focused on early detection and risk reduction for cancer. Agents used these materials at a variety of events including fairs, livestock shows, Texas Extension Educators Association meetings, civic club meetings, 4-H meetings and events, camps, and many other events in their counties. Volunteers were trained to use flip charts containing narratives and pictures to inform community groups how to prevent skin cancer.

According to the Centers for Disease Control, there is a lack of programs to reduce youth tobacco use in rural communities. To address this issue, funding was obtained to develop a process to reduce tobacco use in rural communities. The program, Students Working Against Tobacco (S.W.A.T.), was implemented in Van Zandt county. An advisory board was formed consisting of school nurses, local media, law enforcement, teachers, parents, 4-H leaders, and students. The group did baseline measurements including assessing smoking policies in local restaurants and counting the number of youth smoking in known gathering places. Further, students in schools were asked to indicate whether they smoke or not using an anonymous ballot. The team has presented prevention programs in local schools, stock shows, fairs, Headstart and other similar sites. The team also worked towards changing local ordinances regarding smoking in public places. A manual was finished this year that delineates the process rural communities may use to reduce youth tobacco use.

Internal Collaborations include the 4-H program. External linkages have been formed with the Texas Cancer Council, and a variety of others including local hospitals and clinics, civic clubs, fair and livestock show boards, other Texas Cancer Council funded projects like the Stop Spit Tobacco Network, work sites, churches, and many others.

B. Impact of Programs

In the Walk Across Texas Program, 10,021 participants established a habit of walking during this eight-week program. Their mileage increased from 13.2 miles in week one to 14.9 miles in week eight, a statistically significant increase. Almost 50 percent reported feeling less stressed. A number of participants reported that their doctors reduced their diabetes, cholesterol and blood pressure medicine because of their increased physical activity. One participant county reported: “I dropped my cholesterol 30 points during Walk Across Texas. He attributed his success to Walk Across Texas helping him increase his activity long enough to make it a habit.

Every dollar spent on a child safety seat saves this country $32 in health care costs. It is estimated that nearly 300 children, ages four and under, were saved as a result of child restraint use in 1998. If all child passengers, ages four and under, were restrained, it is estimated that an additional 173 lives could be saved, and 20,000 injuries could be prevented annually.

Data from the Rural Passenger Safety Education program indicates that over 828 child safety seats were inspected and parents were instructed how to correctly install their child safety seats. 676 new child safety seats were distributed by project members and project trained agent/technicians. 9,200 Texans attended events where they viewed the Rollover Convincer to increase their awareness of the importance of using seatbelts consistently.

Finally, the Cancer Risk Reduction for Rural Texans also had an impact on its participants. Participants attending awareness activities have said they were going to have suspicious lesions checked and others have said they will begin using sunscreen and protective

clothing as well as avoiding tanning beds. All youth attending Health Tech camp go back to their communities and serve as peer educators, conducting tobacco and skin cancer prevention activities. A number of the youth attending Health Tech have expressed an interest in pursuing a health career so they can return to their rural communities as health professionals. Mini-grants to agents have been used to deliver a variety of programs aimed at reducing the incidence of skin cancer and tobacco use. These mini-grant supported programs enabled agents to provide cancer prevention activities at summer camps and at a number of civic groups.

Output Indicators:

Walk Across Texas

Number of people completing non-formal education programs on health promotion. 10,021 participants

Rural Passenger Safety Education

Number of people completing non-formal education programs on health promotion. 828 participants

Cancer Risk Reduction for Rural Texans

Number of people completing non-formal education programs on health promotion. 117,227 participants

Outcome Indicators:

Walk Across Texas

The total number of people completing non-formal education programs on health promotion who actually adopt one or more recommended practices within six months after completing one or more of these programs. 10,021 participants reported completing 8 weeks of walking. Their mileage increased from 13.2 miles in week one to 14.9 miles in week eight. This was a statistically significant increase.

Lifestyles and eating habits have resulted in a major increase in the incidence of diet-related diseases. This has serious implications for the individual, family and the overall economy. There is an increasing focus on preventing diseases through diet rather than curing diseases with drugs and surgery. TAES and TCE have an integrated program designed to have maximum impact across Texas and the nation. A component of the overall approach includes the Vegetable and Fruit Improvement Center (VFIC), a research and extension concentrated effort to address diet and health. This center working with scientists from the state's top medical centers, have devised and implemented a research and education plan that will not only make fruits and vegetables more healthful for people to eat but also economically strengthen the total produce industry. The FVIC is organized with industry partners which fund a part of the research and graduate assistantships. There are 42 partners located in eight states, the U.S. and Germany and include seed companies, grocery stores, restaurants, grower/shippers, national associations, nutraceutical companies, processors, and individuals.

Vegetables and fruits are a necessity for good nutrition and health, a flavorful part of our diets and an important impact on the economy . The VFIC research and Extension program focuses on carrots, grapefruit, melons, onions, peaches, peppers, plums, and watermelon and the natural-occurring compounds found in these crops.

The VFIC conducts research and Extension in four major areas: 1) biomedical–documentation through in vivo and in vitro studies of plant protective properties versus human disease; 2) postharvest handling and processing–develop techniques for preserving healthful compounds in fruits and vegetables; 3) production–develop more efficient production techniques that reduce the need for inputs such as water and farm chemicals; 4) breeding and genetics–increase levels of naturally-occurring compounds that help prevent human disease.

VFIC research developments include:

- 'BetaSweet'™ maroon carrot developed through traditional plant breeding techniques. This carrot has 40% more beta-carotene (a health-promoting compound) and higher sugar content to improve overall flavor. Plant Variety Protection (PVP) was awarded to this carrot in 2001. This carrot is now being sold commercially throughout the world and receives increased interest from health conscious consumers for its good source of carotene and anthocyanins. The 'BetaSweet' carrot has been highlighted in a variety of articles in publications such as the *Washington Post* and *New York Times*. The carrot has expanded to be a "value added" health food for its use as a whole-food additive in juice, ice cream and nutraceutical supplements.
- 'Legend' onion received Plant Variety Protection in 2001. This onion is a new variety with germplasm of the 'Texas 1015' which revitalized the South Texas onion industry. Legend is a mild sweet onion that matures earlier than the Texas 1015. Mild sweet onions will encourage consumers to eat more and obtain the benefits of the quercetin and organo-sulfur compounds which have been shown to prevent disease. This onion is licensed by three seed companies and is used in their hybrid programs.
- 'TAM Mild Jalapeno' was released in 2002 for its good jalapeno flavor and resistance to multiple viruses that plague growers. This variety will reduce the use of farm chemicals.
- A feeding study has shown that quercetin does influence the severity of aberrant crypts, which is categorized by the number of aberrant crypts found in close proximity to each other at the exclusion of normal crypts (called aberrant crypt foci). This is evidence that quercetin found in onions, peppers, apples and lesser amounts in other crops assists in preventing colon cancer.

Education is an integral part of the VFIC.

- Graduate students receive guidance and training from the scientists working in the Foods for Health program. The VFIC has provided assistantships for 23 students completing masters of science and doctoral degrees. They are working world-wide as plant breeders, production managers, educators, and research and development directors in the agriculture industry. Currently there are 7 students receiving assistantship for advanced degrees. These young professionals are very instrumental in the development of new varieties and genetic markers, production methods, and laboratory procedures.
- The Center also hosts an age-appropriate outreach program VICkids (http://vickids.tamu.edu) to promote the health benefits of including fruit and vegetables in their diet and the science to improve the fruits and vegetables they eat. This program has gained acceptance through the public schools with participation increasing from 472 children in 2000 to over 1,300 children in 2003. This program also utilizes the Tran Texas Video Network to reach children outside the local area.

- A ‘first of its kind’ multidisciplinary course entitled “Phytochemicals” was created and funded through the USDA Challenge Grants. This course is team taught by 22 faculty from across the United States to over 50 enrolled graduate students. The faculty expertise range from agriculture to medical research. Students are in nine locations across Texas, at the University of Michigan and Purdue University. The website is http://phytochemicals.tamu.edu

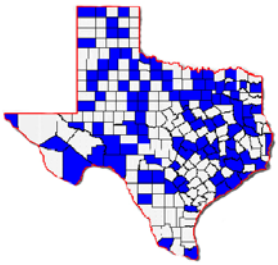
Scope of impact:
Multi-State Industry Support – CA, MI, MO, OR, TX, VA, WA, WV
International Industry Support – UK, GER
Multi-State Education – TX, MI, IN
Integrated Research and Extension:
Research and Extension faculty cooperate to develop program in general health and foods for health.

State TCE-TAES Plan of Work Program 6: Diabetes Education
Key Theme: Human Health, Human Nutrition

A. Description of Activity

Diabetes is a significant problem affecting ~920,000 Texans who know they have the disease and another 680,000 Texans are undiagnosed. Failure to control blood glucose levels to prevent long term complications results in increased health care costs, increased loss of time from work due to illness, amputations, poor health status leading to decreased quality of life. Education is the single most important thing people with diabetes can do to improve their health status and prevent the onset of complications. Additional benefits possible might be that health care insurance costs could decrease by controlled blood glucose levels through proper nutritional management and increased exercise resulting in fewer chronic complications, less time lost from work due to better nutrition practices and self-care health management, and reduction in long term illness and health care costs.

Twelve diabetes educational lessons, along with handouts, visuals/transparencies/ PowerPoint presentations, CD- ROMs with PowerPoint presentations, videos (purchased and in film library), and activities included with each lesson. Diabetes curricula *Do Well, Be Well with Diabetes*™ on the following components: **Overview Lesson** is What is Diabetes?**, 6 Nutrition Lessons** include the following: Nutrition–First Step to Diabetes Management; Dietary Treatment of Diabetes; "One Diabetes Diet" - No Longer the Sole Option!; Nutritional Labels; For Good Measure, and Eating Out. **Self Care Lessons** include: Managing Your Blood Sugar; Diabetes and Exercise; Foot Care; Health Checkups; and Medicines for Diabetes. To test the curricula and insure its credibility in 2001-2002, a pilot test was conducted in 12 Texas Counties to fine tune the curricula. Organizational process included county faculty selected by their supervisors, the administration and the nutrition and health specialists. A diabetes team of specialists, editors, artists, graphics designers, marketing specialists, and administration finalized the curricula. This process resulted in total of 97 trained agents in 102 Texas counties in 2003 selected according to their performance and ability to plan, implement and evaluate their programs as shown here:



In addition to the *Do Well, Be Well with Diabetes*SM conducted in 2003 (phase 1), a coalition of county faculty, nutrition and health specialists, administration and other experts planned a 4-lesson cooking school series entitled *Cooking Well with Diabetes*SM with the pilot training set for early 2004.

The target audiences for these programs include persons with Type 2 diabetes, family members, limited income adults, ethnic groups with a high incidence of diabetes (Hispanics, African-Americans, other) and Youth with Type 2 diabetes mellitus; and secondary, health professionals working in counties throughout the State**.**

26,298 group contacts and 58,620 individual contacts Number of Participants Reached
~60 % of Participants Underserved

Partnerships and cooperative relationships will be established or maintained with**:**

External: Texas Commission for the Blind, Texas Diabetes Council - Texas Department of Health Administration, Advocacy Committee members and regional offices, American Diabetes Association, American Association of Diabetes Educators, American and Texas Dietetic Associations, National Center for Farm Health, Denton, Dallas and Tarrant Counties Diabetes and Cardiovascular Coalitions, Diabetes Institute and University of Texas Health Science Center of San Antonio, certified diabetes educators, county hospital associations, local hospitals, local health professionals, health organizations, pharmacists, pharmaceutical and diabetes suppliers.

Internal: Extension Food/Nutrition Specialist - Special Food/Nutrition Needs, Family Development/Resource Management–Health, Evaluation and Program Development Specialists, School of Rural Public Health, TAMU Medical School faculty, and TAMUS Health Sciences Center faculties health professionals**,** County Extension Agents in Family and Consumer Sciences, other Extension programs such as those targeting limited incomes or specific ethnic groups.

B. Impact of Programs

Summary of Outcome Measures

Extension diabetes programming efforts educated clientele in 2,701 programs with 26,298 group contacts and 60,245 individual contacts with approximately 60 percent representative of underserved populations. In the previous three years, the county programs attracted more than half of consumers with diabetes and health professionals in an average of 126 Texas counties. With more collaborations, coalitions, and partnerships within the medical communities in local counties, Extension has gained respect as a reliable resource for nutrition and self care. Today, more than ever, nutrition education and self-care education using strategies for effecting behavior changes are recognized as essential in the management of diabetes and in reducing the risk of developing long-term complications. Following the initial education by the diabetes team members (physician, dietitian, nurse, diabetes educator, psychologist, etc.) County Extension agents, trained in diabetes education and in additional professional diabetes education meetings, are well-equipped with knowledge and skills needed to help persons with diabetes achieve the ultimate goal of glucose control. Extension educators are trusted for providing sound advice and their leadership ability in establishing local health coalitions. Ongoing diabetes education was noted with 784 individual diabetes education events in Texas counties. However, the outcome diabetes program will focus in approximately102 county programs continuing for 2003 to 2004, provided funding still available.

Outcome Measures (Indicators) Examples

Preliminary data supports that Extension diabetes education has enabled persons with diabetes to make positive changes in behavior and practice self-care as shown from the Extension Diabetes Proxy Study (*Diabetes Educator Journal*, Sept./Oct., 1995). The study was conducted to show the impact of diabetes programming, significant behavioral changes ($p<0.05$) made by clientele, and additional information from focus groups for insight into the barriers preventing diabetic compliance. Evaluation of baseline knowledge and current behavior provided invaluable information about what personal characteristics and knowledge of practices lead clients with diabetes to change certain habits thus improving diabetes control, and leading

ultimately to better health and well-being. In 2003, some 35 outcome-based educational programs included the following Texas counties: Baylor, Brazos, Caldwell, Dallam, Deaf Smith, Ellis, Fannin, Hardeman, Hemphill, Hockley, Hopkins, Houston, Hunt, Jones, Karnes, King, Limestone, Medina, Ochiltree, Parker, Runnels, San Patricio, Sherman, Smith, Throckmorton, Tom Green, Washington, Wilson, Wood.

2003 Key Results of *Do Well, Be Well with Diabetes*[SM]

In 2003, some 993 registrants with mean age of 62 years of age in *Do Well, Be Well with Diabetes*[SM] yielded 489 useable data sets for comparison of pre- and post-test results. These audiences were: 72 percent Anglo; 16 percent Hispanics; 9 percent African American; and 3 percent other ethnic groups. Though the sample was small, the positive changes participants made were worth noting. Here are some of the most significant of those results:

- ✦Of 933 participants, 72 percent indicated that they had no diabetes classes before joining this Extension diabetes program.
- ✦ Some 87 percent of the participants attended all 12 classes offered.
- ✦ The days per week they check their blood glucose, as reported on pre- and post-test instruments, increased from 7 to 11 times.
- ✦ Before the program, the number of participants who tested their blood glucose themselves was 72 percent— as opposed to having it done by a doctor, or someone else, or no one at all. After the classes, 92 percent reported testing.
- ✦ Before the classes started, the average blood glucose reading for 632 participants was 131 milligrams per deciliter. After the classes, the average blood glucose reading for 388 participants dropped to 120 mg/dL.
- ✦ Before classes, 552 participants reported working out for 32 minutes, 4 ½ days per week. Some 20 percent reported doing no exercise at all. After the classes, 42 percent reported that they exercise 30 minutes, 5 times per week.
- ✦ On the pre-test, over 42 percent of the participants reported following no meal plan to manage their condition. On the post-test, that figure dropped to 39 percent. Meal plans for carbohydrate counting increased from 16 percent up to 29 percent on the final test.

Other Outcome Indicators

Awareness of Managing Food Choices Through Healthful Eating To Control Blood Glucose

26,298 group contacts and 60,245 individual contacts became aware of importance of controlling blood glucose through healthful eating (decreasing fat, sugar, increasing complex carbohydrates) and self-care (self-glucose monitoring, exercise, visiting with health care provider, and taking medications and/or insulin diabetes) through the Extension diabetes programming in Texas counties.

Awareness of importance Self-Blood Glucose Monitoring

26,298 group contacts and 60,245 individual contacts on the awareness of importance of adequately monitoring blood glucose levels 4 times a day

Awareness of Exercising to Control Blood Glucose

26,298 group contacts and 60,245 individual contacts on the awareness of importance of engaging in daily exercise

Summary of Output Measures

2,701 Number of group method contacts

26,298 Number of people completing programs (Group Methods)
60,245 Number of Participants Served by (Individual Methods) (Trend is that clientele with diabetes seeking information via individual assistance)
36,572 Number of written diabetes educational materials distributed via newsletters, self-study guides. Diabetes resources will be included in a new diabetes curriculum *Do Well, Be Well with Diabetes*[SM] , 12-week Nutrition and Self-Care TCE Curricula with accompanying PowerPoint visuals with each lesson, handouts, and some web-based educational resources

Many health professionals, clientele with diabetes, internet users, seek diabetes information via the web via Extension. To accommodate this continual access to knowledge, web based Extension diabetes nutrition/self-care information can be found at: Food/Nutrition http://fcs.tamu.edu/food_and_nutrition.htm and FCS http://fcs.tamu.edu/ and Health websites http://fcs.tamu.edu/food_and_nutrition.htm , food/nutrition electronic newsletters http://calcium.tamu.edu/mickey/newsletters/ , Health Education Rural Outreach (HERO) newsletters on diabetes http://fcs.tamu.edu/health/ , diabetes nutrition and health related bookmarks organized http://calcium.tamu.edu/mickey.html .

C. Sources of Federal Funds

TCE: Smith-Lever and State Matching
TAES: None

D. Scope of Impact

Multi-State Extension: State Specific
Multi-State Research: None.
Integrated Research and Extension: Collaboration among Extension nutrition (registered/licensed, dietitian) specialist, Department of Animal Science, and Extension health specialist (registered/licensed nurse); diabetes response team made up of County Extension Agents in Family and Consumer Sciences in several Texas counties trained in diabetes education via special Statewide training and participation in American Association of Diabetes Educators Annual Meetings; and various outside partnerships/support (see Target Audience).

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program 6, Diabetes Education.

State TCE-TAES Plan of Work Program 7: Better Living for Texans
Key Theme: Human Health, Human Nutrition

A. Description of Activity

An estimated 14.7% of Texans live in poverty. Research suggests that individuals who live in poverty consume diets that are not in agreement with the Dietary Guidelines for Americans and the Food Guide Pyramid. In addition, the diets of individuals in low-income households are often deficient in fruits, vegetables, and dairy products. This is due, in part, to a lack of knowledge and an inability to purchase and prepare healthy foods on limited budgets. Individuals who live in poverty are also at risk for being food insecure. This means that the ability to acquire safe and nutritious foods is limited or uncertain. In 2002, the USDA reported that nearly 15% of Texas households had experienced food insecurity during the previous 12-month period. A recent survey of 1,000 households participating in the Food Stamp Program throughout Texas found that more than half of those households had experienced food insecurity or hunger within a 12-month period.

The core of the Better Living for Texans (BLT) program was a series of 5 to 6 lessons, which focused on basic nutrition, food preparation, food resource management, and food safety. The curricula used in this program were research-based, targeted toward limited resource audiences, and available for county Extension agents. When possible, materials were available in Spanish as well as English for Spanish-speaking audiences and instructors. Newspaper articles as well as television and radio were other avenues used to market the BLT program and distribute information about food and nutrition to limited resource audiences.

During the 2002-2003 program year, the primary audience for BLT was food stamp recipients and applicants. However, BLT was granted five waivers which allowed the inclusion of other limited resource audiences: (1) families of students in schools with more than 50% of the student population eligible for free and/or reduced price lunches, (2) families of Head Start participants, (3) families whose children participate in the Summer Food Service Program, (4) families of women and children who participate in the Special Supplemental Food Program for Women, Infants, and Children (WIC), and (5) families of participants who receive food from commodity food distribution sites. During the program year, BLT was conducted in 226 counties across Texas, resulting in 175,885 direct educational contacts. Of those175,885 contacts, 35% were made to Caucasian, 15% to African Americans, and 49% to Hispanics. Less than 1% of those contacts were made to individuals who identified themselves as Native American or Asian American.

Internal linkages were developed with several sources. Nutrition specialists recommended curricula and educational materials, and participated in the training of agents and paraprofessionals. During 2002-2003, Nutrition Specialists completed the development of the *Eat Better to Live Better* curriculum. This curriculum is a series of lessons that reflects the current objectives of BLT. This curriculum will be the core curriculum for the 2003-2004 program year.

Linkages were also developed with external sources. TCE collaborated with other agencies, including the Texas Department of Health (WIC program), the Texas Department of Human Services (Food Stamps), as well as local housing authorities to identify and recruit eligible participants. Agents also marketed and conducted BLT programs in conjunction with

other community organizations that serve the targeted audience including food banks, food pantries, churches, community centers, and congregate feeding sites.

B. Impact of Programs

Output Indicators:

# of educational activities conducted:	13,314
# of direct educational contacts:	175,885
# direct educational contacts via newsletters and self-study guides	153,946
mass media	
# news releases prepared	1,711
# news outlets receiving releases	6,193
# radio releases prepared	269
# radio stations receiving releases	193
# television releases prepared	43
# television stations receiving releases	48

Outcome Indicators:

The extent to which outcome indicators were met was based on a statewide telephone survey of a sample of individuals who participated in a six-lesson series as a part of the BLT program during the 2002-2003 year. Trained interviewers administered the survey to the 381 individuals who agreed to participate. Surveys were conducted in both English and Spanish.

Outcome Indicator #1:
Number of limited resource individuals who are able to provide themselves and family members a variety of food for a healthy diet using the Food Guide Pyramid and the Dietary Guidelines as guides.

Results: The consumption of the number of servings of fruits, vegetables, and dairy products was significantly higher after subjects completed the BLT program in comparison to before entering the program.

	# servings consumed		
Food	**Before (Mean value)**	**After (Mean value)**	**Significance**
fruits	1.9[a]	2.7	.05
vegetables	1.7	2.7	.05
milk/dairy products	2.2	2.6	.05

[a] mean number of servings, rounded to the nearest tenth

Participants also reported improvements in a number of behaviors that are in agreement with the Dietary Guidelines for Americans. As part of the survey, participants were asked if they had changed any of their eating habits as a result of attending the BLT program. Eighty-one

(81%) percent of the respondents reported changing one or more behaviors. A follow-up question asked respondents to provide an example of at least one eating habit that they had changed. Of the 300 respondents who answered this question, 14.2% reported eating more vegetables, 11% reported eating less fat, 7% reported eating more fruits, 5.3% reported eating at the proper time and counting calories, and 4.3% reported eating proper portion sizes.

Outcome Indicator #2

Percentage of limited resource individuals who are able to select, prepare, and handle foods for themselves and family members to reduce nutrition-related health risk factors.

Results

This outcome indicator is related to food safety practices and the extent to which individuals perceive their ability to prepare nutritious meals for their families. In the survey, three food safety habits were investigated: the length of time cooked foods are left out before eating or refrigerating, hand washing, and washing cutting boards, knives and counter tops with hot, soapy water after working with raw meat or poultry. Prior to the program, respondents reported leaving food out before eating or refrigerating for an average of 149 minutes. After BLT, the average amount of time food was left out dropped to 85 minutes. With respect to hand washing, more than 70% of respondents reported that before BLT, they "always" washed their hands before preparing food. After the program, this percentage significantly rose to more than 87%. In addition, the percentage of participants who reported "always" washing their cutting boards, knives, and countertops with hot soapy water after working with raw meat or poultry rose from 73.8% (before BLT) to 93.7% (after BLT).

Participants were also asked to identify any food safety practices they had changed since attending the BLT program. Nearly two-thirds (65%) of participants identified one or more food safety behaviors they had changed. These behaviors include: storing food in the refrigerator (16.4%), not leaving food out (12%), washing foods and utensils properly (9.3%), and cooking meats thoroughly (5%).

As part of outcome indicator #2, participants were asked to describe the extent to which they could prepare nutritious meals for their families. The percentage of participants who rated their ability to feed their households nutritious meals as "very good" more than tripled from 26.7% before BLT to 95.5% afterwards. Likewise, the percentage of participants who rated their ability as "very poor" fell from 28.1% before BLT to only 0.3% after BLT.

Outcome Indicator #3

Percentage of limited resource individuals who are better able to manage food purchasing resources to have food available through the end of the month without seeking emergency assistance such as food banks.

Results

Planning meals, shopping with a list, and comparing prices when grocery shopping are behaviors that can help limited resource audiences manage their food purchasing resources so food is available for their families through the end of the month. Prior to the BLT program, less than one-third (29.1%) of the respondents reported that they planned their meals "always" or "most of the time." However, this figure more than doubled (68.5%) after the BLT program. Less than half (43.8%) of respondents reported that they shopped with a list "always" or "most of the time" before attending the BLT program. After the BLT program, the percentage of

respondents who reported shopping with a list "always" or "most of the time" rose to 79.5%. A similar trend was noticed when respondents were asked about the extent to which they compared prices. Prior to attending the BLT program, 40.4% of respondents reported comparing prices when grocery shopping either "always" or "most of the time." After attending BLT, that percentage more than doubled to 88.9%. For the 37.3% of respondents who were receiving food stamp benefits, more than half (55.4%) reported that as a result of participating in the BLT program, their food stamps were lasting longer.

Impact of the Program

Subjects who participated in the BLT program reported significant improvements in their diets, in their ability to manage their food resources, and in their household food security status. This indicates that BLT is effective in teaching limited resource individuals and families food and nutrition skills that improve one's ability to follow national dietary recommendations while reducing the need for emergency food assistance.

C. Source of TCE-TAES Federal Funds

TCE: Smith-Lever and State Matching

TAES: None

D. Scope of TCE-TAES Impact

Multi-State Extension – WS, OH, CO

TAES – None

Integrated Research and Extension - Research methodology is integrated into the BLT program via the state-wide telephone survey conducted each year. Results, which have been featured in this report, have recently been presented at national nutrition meetings for discussion with other nutrition researchers and program directors. Results from the 1999-2000 state-wide survey were published in the December 2001 issue of the *Journal of Extension* (http://www.joe.org/joe/2001december/rb4.html) Beginning in 2002, 1000 food stamp households across Texas will be surveyed to assess the interest in selected food and nutrition topics offered through the BLT program. The survey will also assess the prevalence of food insecurity and hunger.

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program 7, Better Living for Texans.

Goal 4: Greater harmony between agriculture and the environment

Overview

Several programs of Texas Cooperative Extension and the Texas Agricultural Experiment Station support Goal 4—creating more harmony between agriculture and the environment and increasing environmental stewardship.

Improving the relationship between agricultural production and the environment was identified as a high priority need during meetings held for the Texas Community Futures Forum. Consequently, achieving this goal has become a significant component in Extension outreach, demonstration, and programming activities.

In broad terms, efforts to meet Goal 4 center upon the principles of providing agricultural producers with objective, timely research-based information; encouraging them to take this information and incorporate it into decision-making processes; and to demonstrate practices in the field that will lead to widespread adoption by producers and other stakeholders. At the same time, education programs for producers, stakeholders, the public, and youth are developed to create grass-roots support.

Cooperative Extension specialists worked extensively with agricultural producers in the Lake Aquilla watershed to better manage atrazine applications to avoid pesticide runoff. This program was so successful that State agencies assert that significant steps have been made in reducing pollution in the lake.

In West Texas near San Angelo, Cooperative Extension specialists are working with researchers and other State agency personnel to restore degraded grazing lands. The efforts involve such diverse activities as soil tilling and chiseling to promote infiltration, reseeding the area with native grasses, and controlling desert termites and other insects that damage desirable range vegetation.

On the High Plains, Cooperative Extension specialists are reaching out to producers throughout the region in two efforts---"AgriPartners" and the potential evapotranspiration (PET) network. In AgriPartners, Extension agents and specialists served more than 15,000 clients throughout a 21-county region by utilizing technicians to perform on-farm demonstrations about water conservation practices, how to time irrigations to save water based on research on crop specific water requirements, and strategies to reduce the volume of pesticides applied. In the PET network, Extension specialists team up with the U.S. Department of Agriculture Research Service (USDA-ARS) in Lubbock and Amarillo to provide daily updates about crop water needs and weather conditions that can be used to determine the precise amount of irrigation to apply, thus avoiding excess applications and waste.

Throughout the reach of the Trinity River (at its origins near Dallas and Fort Worth and where it empties into the Gulf of Mexico near Galveston) Cooperative Extension professionals are enacting programs to prevent nutrient runoff into this water body. Extension work in Fort Worth involves education programs to manage residential landscapes and golf courses with substantially smaller quantities of nutrients and pesticides. At Galveston, Extension education efforts explained how "Bay-friendly" landscapes can be developed and maintained that look great and perform well, even though they are designed to require relatively little maintenance. Both sites included the use of school curricula and adult education materials developed by Extension.

In South Texas, Cooperative Extension professionals worked with agricultural producers to demonstrate how conservation tillage practices can be used for crop and pasture production. This project was carried out at the Luling Foundation Farm and other sites and taught clients how

reduced-tillage systems can be integrated with dryland or reduced irrigation production strategies. More than 800 agricultural producers took part in hands-on demonstrations and field days associated with this effort.

Sources of Funding and FTEs

TCE Funding: Smith Lever and State Matching

		$ X 1000 Actual FY 2003
Program 8 – Water Quality & Quantity Management		4,218
	FTEs	196.74
Allocated Resources Goal 4		**4,132**
	FTEs	**192.73**

TAES Funding: Hatch, and state, federal and private contracts and grants

Source of Funding and FTEs

Hatch Funds ($ x 1000):	1,532
State Funds ($ x 1000):	8,099
FTEs:	57.38
Number of Projects:	196
Number of Publications:	895

State TCE-TAES Plan of Work Program 8: Water Quality and Quantity
Key Theme: Water Quality, Natural Resource Management, Drought Prevention and Mitigation

A. Description of Activity

As the population of Texas increases, and needs for water become greater, it is becoming increasingly apparent that several regions of the State will be unable to provide sufficient supplies of high quality water for agriculture, drinking water, urban uses, industry, and the environment unless extraordinary measures are taken.

To help Texas manage its water resources to the greatest possible extent, scientists and specialists with the Texas Agricultural Experiment Station (TAES) and Texas Cooperative Extension are developing and implementing comprehensive research, outreach, and extension programs. Throughout these programs, some common goals are evident:

* Ensure that water supplies are used efficiently in agriculture production, landscape maintenance, in the home, and in other settings.
* Protect water quality by preventing contamination in a number of settings, including agricultural practices, the operations and maintenance of on-site wastewater treatment systems, landscape and turfgrass maintenance, and the use and disposal of household chemicals.
* Identify opportunities to develop alternative, untapped, sources of water, including extensive efforts in water conservation, water and wastewater reuse, the efficient treatment of saline and brackish waters, and recovery of brines resulting from oil and gas operations.
* Provide objective research-based information water managers, policy makers, and the public can use to evaluate the merits of proposed measures to conserve water, increase water supplies, develop infrastructure, and improve water quality by treating sources of impairment.
* Bring timely information about critical issues to water resources managers, policy makers, and the public, including such topics as water marketing, the formation of groundwater districts, the need to manage storm water runoff, and new governmental regulations and programs that affect water resources management.
* Promote widespread education programs directed at school children and adults, including efforts touching on such issues as drinking water quality, environmentally-friendly methods to maintain landscapes, and ways to achieve water conservation in the home and on the farm.

<u>Highlighted Programs</u>

The Irrigation Technology Center. Because irrigation uses so much water, there are significant opportunities for conservation. For example, conservative estimates suggest that as much as half the water applied through conventional crop and landscape irrigation systems is often lost. When agricultural producers, homeowners, and commercial landscaping mangers are not well-educated about how to manage and schedule irrigations, estimates suggest water losses increase by as much as an additional 30%.

To address the challenges facing the irrigation industry and to ensure that irrigation is used as efficiently as possible, the Texas A&M University Agriculture Program (Texas

Cooperative Extension and Texas Agricultural Experiment Station) is developing The Irrigation Technology Center (ITC).

The Center has been located in San Antonio, and works in close cooperation with the TAMU Agricultural Research and Extension Centers in Uvalde and Weslaco, the U.S. Department of Agriculture Natural Resources Conservation Service (USDA/ NRCS) office in Hondo, and several other partners, including federal, state, and local agencies. The same time, the TAMU Uvalde Research and Extension Center is utilizing field studies to provide extensive data about crop irrigation needs and the performance of irrigation systems in the field throughout the growing season.

The Center draws upon the expertise of the entire Agriculture Program, including scientists and Extension personnel throughout the State. Programs of the Center address urban and agricultural irrigation needs, the testing and certification of new irrigation technologies, wastewater use, and international programs.

Broad goals of the ITC are to develop design and performance standards for agricultural and landscape irrigation systems, to provide training and education, to test and certify irrigation equipment, and to develop improved irrigation technologies, strategies, and best management practices.

The Rio Grande Basin Initiative. Through the Rio Grand Basin Initiative (RGBI), the TCE and TAES are working with the U.S. Department of Agriculture Cooperative States Research, Extension, and Education Service (USDA-CREES), New Mexico State University, and several other partners to increase the efficiency of water use along the U.S.-Mexico border. The RGBI effort encompasses several distinct goals including the following:

Irrigation District Studies of infrastructure efficiency and cost or rehabilitation.
Irrigation Education and Training.
Institutional Incentives for Efficient Irrigation Use.
On-Farm Irrigation System Management.
Urban Landscape Water Conservation.
Environment, Ecology, and Water Quality Protection.
Saline and Wastewater Management and Water Reuse.
Basin-Wide Hydrology, Salinity Modeling, and Technology.
Communications, Oversight, Biometric Support, and Accountability.

Through this comprehensive effort, research and education efforts to thoroughly address the most critical water issues confronting this water-short region. For example, professors in the Biological and Agricultural Engineering Department have developed and implemented the District Management System (DMS) software program that displays irrigation systems in a geographic information system that can be used to prioritize areas where infrastructure such as mains and canals need to be improved. In addition, professors in the Agricultural Economics Department have worked hand-in-hand with irrigation districts to assess the costs and benefits (including water savings) of rehabilitating irrigation infrastructure in specific districts. Training about DMS has been conducted by Cooperative Extension Professionals. Meanwhile, professors in the Agricultural Economics Department at Texas A&M have cooperated with colleagues at the Texas A&M Centers at Weslaco and El Paso to evaluate policy issues that may restrict efficient water use. These studies have covered such topics as water rights, economics, and incentives to individual farmers and irrigation districts that may encourage conservation. Water conservation in urban landscapes includes researchers with the Recreation, Parks, and Tourism

Sciences Department who are compiling extensive data about water conservation practices employed by cities and water districts along the border, while scientists in the Soil and Crop Sciences Department are exploring complex factors that influence overall water use in residential landscapes including the attitudes and behavior of homeowners. Environmental and water quality issues are yet another targeted effort of RGBI research and Extension work, and include a comprehensive study of the aquatic biology of fish and other species that live in the Rio Grande, as well as efforts to document such water quality concerns as salinity, pesticides, nutrients, and fecal bacteria.

In sum, RGBI is playing a key role in improving water rights and water supplies for Lower Rio Grande Valley residents at a time when the future water supply in the region is most in need of assistance. Based on the effort of Texas and New Mexico scientists, rehabilitation projects and management practices have been implemented across several irrigation districts leading to the saving of tens of thousands of acre feet of water.

B. Impact of Programs

Output Indicators

A.4.1.3: The total number of people completing non-formal education programs on sustaining and protecting ecosystem integrity and biodiversity while improving the productivity of the U.S. agricultural production system.

A variety of educational programs were implemented to deliver information on sustainability and maintaining agriculture production systems. Central Texas is facing challenges with atrazine, especially as it relates to how runoff of this pesticide might be impairing water quality at Lake Aquilla. Extension programs taught participants about best management practices to reduce atrazine runoff. Delivery methods included one-on-one contacts and producer meetings conducted by Extension agents and specialists. Total attendance at these events was 103,260 contacts.

A.4.2.1: The total number of people completing non-formal education programs on sustaining and/or protecting the quality and quantity of surface water and ground water supplies.

A variety of education methods were utilized to deliver information on sustaining and protecting the quantity and quality of surface water and ground water supplies. North Central Texas includes rapidly-urbanizing watersheds with growing water demands. To meet these demands, education programming focused on educating residents about best management practices to conserve water, including efficient irrigation devices and management strategies to save water on agricultural crops and in the home. Delivery methods included one-on-one contacts and producer meetings conducted by Extension agents and specialists. Total attendance at these events was 266,202 contacts.

Survey and evaluation data suggest that more than 35% of Pecos County residents are now more aware of the amount of water they use, as a result of Extension and Texas Agricultural Experiment Station programs. As a result, more than 25,000 acres in the county are using water conservation practices and the Pecos County Irrigation District Number 1 reports that water use has dropped by 0.4%.

Personnel from 19 irrigation districts received technical assistance from Extension about how to conduct ponding tests to assess the extent of water lost from seepage through irrigation distribution systems.

A total of 256 people participated in short courses that are part of the Extension Irrigation Schools, led by the Biological and Agricultural Engineering Department. The schools offered classes dealing with landscape irrigation auditing and management, irrigation of commercial landscapes, and how to use software to design and manage landscapes.

Forty-five public school students in Calhoun County were exposed to an educational program describing how water moves through aquifers and groundwater systems that was presented by Extension.

Eighty-four Galveston Bay residents participated in a workshop led by County Extension agents describing efforts they could take to limit pollutants in storm water runoff. The program describes pollution prevention actions residents can take.

B.4.2.1: The total number of people completing non-formal education programs on water quantity and water quality who plan to adopt one or more water management practices after completing one or more of these programs.

Several Extension programs provide extensive training to participants as a requirement of State-mandated programs for licensing and continuing education, including efforts in onsite wastewater treatment and landscape irrigation management. To meet these needs, Extension offers onsite wastewater treatment courses throughout the State and via the world wide web. In 2003, more than 1200 people (roughly 25% of the septic systems professionals in Texas) took part in these classes.

Twenty-three homeowners in Hidalgo County installed drip irrigation systems to more efficiently water their gardens after attending Extension workshops. Twenty-eight participants attended county programs discussing water conservation in the home.

Through Cooperative Extension programs led by the Texas A&M Soil and Crop Sciences Department, homeowners engaged in water well screening programs to test the levels of nitrate and other contaminants in their groundwater. As a result of these screening programs, education and outreach information was developed describing how wells and surrounding wellhead areas should be managed to protect water quality. In Kinney County, for example, samples from more than 107 residences were screened. Each participant was given information about how to chlorinate or “shock treat” their well to lessen contamination as well as educational materials about potential health risks posed by contaminated drinking water.

Landscape managers at six public school districts, who are responsible for watering 20 athletic fields, were trained about how to most effectively manage irrigation systems. This “SAFE” program (Sports Athletic Fields Education), led by Cooperative Extension specialists in Soil and Crop Sciences and Biological and Agricultural Engineering, lessens water use by roughly 1.5 acre-feet per year.

A.4.3.2: The total number of people completing non-formal education programs on public policy issues affecting agricultural production and ecosystem integrity and biodiversity.

Cooperative Extension professionals in the Wildlife and Fisheries Sciences Department at Texas A&M taught nearly 2,000 clients about recreation pond management and methods to control aquatic weeds at seminars throughout Central Texas and along the Gulf Coast. Participants obtained continuing education credits by taking part in these classes. Other programs

offered by Wildlife and Fisheries Department specialists and agents included water gardening (50 clients), catfish aquaculture (140 clients), and aquatic ecology (60 clients).

Through programs of the Texas Water Resources Institute and Research and Extension personnel with the Recreation, Parks, and Tourism Science Department, water managers at 25 cities on the Texas border (and counterparts in New Mexico) were surveyed to identify the extent to which they use ordinances, fee structures, fines, and other tactics to encourage water conservation. Data are now being analyzed and will be used to identify policies and strategies that might be suited for communities of various sizes that want to more fully stress conservation programs.

In cooperation with the U.S. Bureau of Reclamation, Cooperative Extension and TAES personnel developed a newsletter, "Drought Watch on the Rio Grande." This newsletter, circulated in both print and email forms, reaches a large audience and provides timely information on reservoir levels, expected stream flows, and groundwater supply data.

B.4.3.2: The total number of people completing non-formal education programs on public policy issues affecting agricultural production and ecosystem integrity and biodiversity who plan to become actively involved in one or more public policy issues after completing one or more of these programs.

In 2003, eight new groundwater management districts were proposed. If approved, these districts would provide an organizational structure through which groundwater management would be coordinated and aquifers could better be protected. Extension personnel provided education and training materials to each of the eight regions where groundwater districts were proposed, and presented information about groundwater supplies, applicable regulations, and the merits of implementing local districts to manage groundwater quality and quantity.

To assist groundwater managers in keeping current with timely issues, TWRI, through specialists and researchers, has developed an ongoing series of education seminars in conjunction with the Texas Association of Groundwater Districts. This education program is aimed at assisting groundwater district personnel. Three of these seminars were offered in 2003 and each drew about 400 participants (1,200 total contacts). One seminar dealt with the issue of groundwater marketing, sales and leasing, while the others presented information on the duties of district directors and managers as well as new laws and policies considered recently by the Texas Legislature. In addition, a variety of other materials about groundwater management were produced including educational videos and DVDs and fact sheets.

Throughout 2003, scientists with the Texas Agricultural Station were significantly involved in a number of water resources studies, dealing with such issues as economic assessments, policies, the treatment and reuse of dairy manure to protect the environment, groundwater management in the High Plains, developing complex data about environmental issues that can be used to target watershed restoration efforts, water quality issues pertaining to fecal bacteria, and brush control to increase water yields. Highlighted programs identified here include the following examples.

Through the Rio Grade Basin Initiative, professors in the Agricultural Economics Department utilized the RGIDCON simulation model to investigate the costs and benefits of making capital investments to rehabilitate irrigation systems. These important studies were then used to develop those proposals into funding requests that were submitted to the Bureau of Reclamation, the Border Environment Cooperation Commission and the North American

Development Bank. Many of the projects have been approved for funding, providing jobs and investment and, most importantly, conserving precious water resources for the region.

To-date, nine comprehensive studies have been carried out for irrigation districts in the Lower Rio Grande, and 19 assessments are scheduled.

In addition, agricultural economists also conducted thorough assessments of interrelated water resources issues in the region, including how water quality affects supplies, the way in which water districts manage surface water in the region, and how cities in the Lower Rio Grande region often have to depend upon the infrastructure of agricultural districts to receive the water they need.

Other TAES projects in the Lower Rio Grande included developing internet-based information systems with advice about irrigation management and water use traits of landscape plants. For example, a web-based geographic information systems that provides real-time to water planners and irrigation district managers in the Lower Rio Grande Valley with information on flows, the amount of available water, and salinity data. In addition, TAES researchers created a website that contains data about native and introduced shrubs that may be appropriate for landscapes. Other TAES programs associated with RGBI determined the water use requirements for such crops as corn, grain sorghum, and onions in the Valley, and developed a comprehensive database, in association with the International Boundary and Water Commission, about historic trends in irrigation acreage and water use in the region since 1939.

TAES researchers were also involved in several other major studies. Researchers and extension specialists formed a team that includes TAES, TCE, West Texas A&M University, Texas Tech University, Kansas State University and USDA-ARS, to address issues pertaining to sustainable groundwater use in the Ogallala Aquifer region. This project involves strengthening programs to increase the efficiency of agricultural water use through equipment management and policy incentives and developing strategies for deficit irrigation that will be sustainable over time.

Researchers with the TAMU Agricultural Research Center in El Paso and Vernon are teaming up with scientists with the Texas A&M Poultry Sciences Department, and several colleagues in other agencies, to develop and test state-of-the-science bacterial source tracking methods to precisely identify the origin of fecal contaminants in water supplies. Once the precise sources of contamination are known, programs can then be directed to protect water quality. This work is supported by the U.S. Environmental Protection Agency and the Texas State Soil and Water Conservation Board.

Several programs are underway, coordinated by the Texas Water Resources Institute that included TAES, TCE, USDA-NRCS and others, to develop beneficial uses for dairy manure, thus removing a source of contamination from the North Bosque River and other impaired watersheds and creating a way in which these waste products can be converted into a value-added product. These efforts involve developing programs to market composted dairy manure, to utilize composted dairy manure to stabilize training areas at Fort Hood and lessen sediment runoff to Lake Belton, and to produce turfgrass sod with composted dairy manure that can then be exported to urban areas. These projects are funded by the Texas State Soil and Water Conservation Board and the Texas Commission on Environmental Quality.

Working with the U.S. Army Corps of Engineers, TAES scientists and TCE specialists engaged in a series of comprehensive studies to develop data that can be used to prioritize watersheds that might be ideal candidates for ecological restoration. For example, the Texas Water Resources Institute coordinated a project that involved scientists from the Spatial Sciences

Lab (the Biological and Agricultural Engineering and Forest Science Departments), the Rangeland Ecology and Management Department, and the Wildlife and Fisheries Sciences Department, as well as the College of Engineering. The project created complex data about various parameters involving watershed values and threats as well as an evaluation system that participants can use to identify critical watersheds based on values they assign to a variety of criteria. The project included groundbreaking work on trying to examine how human activities have altered stream flows in specific subwatersheds. The project also lays the groundwork for future in-depth studies in which the Corps will work with stakeholders to develop detailed restoration strategies for specific basins.

Researchers from several disciplines, including Biological and Agricultural Engineering, Rangeland Ecology and Management, and Wildlife and Fisheries Sciences, continue needed work to evaluate the extent to which brush clearing activities may increase water yields in specific river basins. These projects involve using rainfall simulators to more accurately predict runoff from sites where mesquite and juniper have been removed, determining the water use characteristics of individual brush species, and comparing water use and runoff in side-by-side plots where brush has and has not been cleared.

C. Sources of Federal Funds

TCE: Smith-Lever and State Matching

TAES: Hatch, federal, state, and private grants and contracts

D. Scope of Impact

Multi-State Extension – AR, NC, MN, WS, AR, WS, MI, RI, MS, NM, OK, LA

Multi-State Research – Multi-State Projects NC-208, W-128, NE-162 (LA, NM, AZ, CO, FL, ME, MT, OR, UT, WI)

Integrated Research and Extension: Integration of the Research and Extension program is being accomplished through the Texas Water Resources Institute (TWRI). TWRI established an External Advisory Committee to identify the key areas for emphasis programs. This group convened in Austin during December of 2002. This group has assisted the agriculture program consisting of both Texas Cooperative Extension and Texas Agricultural Experiment Station in identifying program areas needing additional attention.

Goal 5: Enhanced economic opportunity and quality of life for Americans.
Overview

Financial Management. Debt repayment consumes a large share of household income. Total consumer debt outstanding at the end of 2003 exceeded $2.0 trillion nationwide and personal bankruptcies increased nationally by 5.2% between 2002 and 2003. The Southern District of Texas led the nation with the highest percentage increase in total bankruptcy filings of any of the 94 federal judicial districts from 2002 to 2003, with a 22.2% increase. Approximately 65 million U.S. households will probably fail to realize one or more of their major life goals, primarily due to a lack of a comprehensive financial plan. In households with annual incomes of less than $100,000, those with financial plans have twice as much in savings and investments as those without financial plans.

Parenting. As family life continues to undergo dramatic changes in the United States, the need for educational resources and training programs to support families (and professionals who work them) is very critical. Recent trends, such as the rise in single-parent, dual-income, and father-absent families, as well as the increase in grandparents raising grandchildren, have tremendous implications for the well-being of America's children. According to recent statistics, approximately 26% of today's children live in single-parent households, where they are much more likely to experience poverty. Over 4.5 million infants, young children, and teens live in households headed by a grandparent (U.S. Bureau of the Census, 2000). Father absent families are at an all-time high, with roughly 24 million children living apart from their biological fathers. Children who group up with absent fathers are at a greater risk for poverty, school failure, child abuse, suicide, criminal behavior, emotional and behavioral problems, early sexual activity, and drug and alcohol abuse. These risks diminish substantially when children grow up with an active and loving father in the home (Lamb, 1997).

Life Skills Education. Youth issues were identified by Texas residents as a high priority for Extension programming. Areas of focus identified by 209 counties from the most recent Texas Community Futures Forum, include ethics, morals, character, pregnancy, drug use, education, and job preparation. Texas 4-H offers nine areas of program delivery to meet the needs of a diverse state. A comprehensive urban plan includes faculty from the 20 most populated Texas counties who work cooperatively toward a consistent program directed to serve the needs of urban youth. Furthermore, focused efforts are directed toward traditionally under-served clientele and accommodations were made to meet the needs of the disadvantaged.

Volunteer Development. Mobilizing and organizing a strong volunteer base is essential to the mission of Texas Cooperative Extension. TCE has the largest volunteer program of any agency in Texas. But with increasing competition for resources, funding, staff and time, sound decisions regarding volunteer recruitment and management will be crucial to sustaining current programs, partnerships and developing new opportunities. All research concerning agencies of the future leads us to know that expanding the outreach and programming components through all volunteer efforts is essential. Volunteers are the real heart and hands of many different Extension programs, extending the reach into every community and every neighborhood in Texas. Extension volunteers help people to gain knowledge and skills that will benefit them for life. And, in return, volunteers have the satisfaction of knowing they're making a difference for their friends and neighbors. Much of the work Extension volunteers do grows out of their interests and experiences, but they also receive training from educators from various disciplines. Thus volunteers improve their own skills while helping others.

Partnerships and Collaborations. During the Texas Community Future Forum process, more than 200 counties identified community issues as high priority concerns. These issues ranged from education and youth concerns to parenting and community activities. The citizens of Texas expect groups and individuals to form partnerships and collaborations to solve the problems of youth, families and communities. Emphasis is being given to groups with interest in community, youth and family concerns. Special attention will be devoted to traditionally under served sectors. Care will be given to meet the needs of the disadvantaged.

Community Development. Stakeholder input provided by over 10,000 Texans in all 254 counties of the state through the Texas Community Futures Forum indicate that issues associated with development of their communities are pervasive and a very high priority. Specific issues include concerns about individual, community and regional economic viability and maintenance of a high quality of life. Programs are designed to increase the capacity of targeted Texans to respond to rapidly changing forces that affect their community economy and quality of life through increasing understanding of these forces and potential responses. Specific programs targeted at engendering and fostering home-based and micro-enterprises, support for identification and realization of entrepreneurial opportunities in agriculture, forest and other natural resource industries; development of tourism and recreational opportunities for local economic benefit; and community leadership training.

Programs in the areas under Goal 5 continue to provide Texans with research-based information in order for them to make sound decision on the implementation of best management practices and adoption of technologies. Educational programming has been and will continue to be driven by the needs of our clientele. Results from the Texas Community Futures Forum, and guidance from Executive Program Councils and program committees serve as the basis for this strategy. The data presented in this summary and the following section represents the efforts of Year 03 of this Plan of Work. Educational programming efforts have been ongoing for many of the areas represented and continue to provide Texans with opportunities for increased profitability and competitiveness. Future plans will build on past experiences and emerging issues that may affect our state and clientele.

Source of TCE-TAES Funding and FTEs

TCE Funding: Smith Lever and State Matching

		$ X 1000 Actual FY 2003
Program 9 – Financial Management Education		634
	FTEs	29.05
Program 10 – Parenting		1,489
	FTEs	68.25
Program 11 – Life Skills Education		2,028
	FTEs	92.89
Program 12 – Volunteer Development		1,087
	FTEs	49.96

Program 13 – Partnerships & Collaborations		343
	FTEs	15.73
Program 14 – Community Development		1,588
	FTEs	14.52
Allocated Resources Goal 5		**8,266**
	FTEs	**385.56**

TAES Funding: Hatch, and state, federal and private contracts and grants

Source of Funding and FTEs	
Federal Funds ($ x 1000):	199
State Funds ($ x 1000):	485
FTEs:	7.58
Number of Projects:	36
Number of Publications:	133

State TCE Plan of Work Program 9: Financial Management Education
Key Theme: Family Resource Management

A. *Description of Activity.*

Debt repayment consumes a large share of household income. Total consumer debt outstanding at the end of 2003 exceeded $2.0 trillion nationwide and personal bankruptcies increased nationally by 5.2% between 2002 and 2003. The Southern District of Texas led the nation with the highest percentage increase in total bankruptcy filings of any of the 94 federal judicial districts from 2002 to 2003, with a 22.2% increase.

Approximately 65 million U.S. households will probably fail to realize one or more of their major life goals, primarily due to a lack of a comprehensive financial plan. In households with annual incomes of less than $100,000, those with financial plans have twice as much in savings and investments as those without financial plans.

Thirty percent of the U.S. workforce who are eligible for 401(k) plans at work fail to participate, and only 20 percent of workers employed by companies with less than 100 workers have any kind of retirement plan.

Two-thirds of all employees in the United States report that they have trouble paying their bills on time and worry about money. Seventy-five percent of employees say that they have recently faced at least one significant financial problem. Individuals and families of all income, ethnic and educational groups in Texas are facing many financial challenges.

Internal and External Linkages were established as follows: During 2002, the new national Extension initiative, *Financial Security in Later Life*, was introduced to urban Extension agents through in-service training. A new partnership agreement was signed with the Federal Deposit Insurance Corporation (FDIC) to promote *Money Smart*, a curriculum targeting the unbanked. County Extension agents collaborated with banks, savings and loans, credit unions, employers, consumer credit counseling services, bankruptcy trustees, and directors of programs targeting financially insecure families, including a multi-county prison system. Cooperative relations were established with Consumer Action, a San Francisco-based consumer organization, to promote the *Money Wi$e* curriculum. Under contract with the Dallas Regional Office of the Women's Bureau, U.S. Department of Labor, a new project, *Wi$e Up - Financial Planning for Generation X Women* was undertaken. In Travis County (Austin, Texas), Extension leadership led to the creation of the Financial Literacy Coalition of Central Texas, a group of more than 20 collaborating groups from public, private, and non-profit sectors that now trains volunteers to provide financial education in the community.

Better Living for Texans programming is funded by the USDA through the Texas Department of Health and Human Services. Agents collaborate with local partners to obtain matching resources, to find sites for classes that are convenient for clients (food stamp recipients of various ages and in diverse county communities and neighborhoods). While the program's primary goal is to promote improved nutrition, another important goal is to teach how to make economic food choices while optimizing nutrition.

To implement the Financial Readiness program, Extension agents at Ft. Hood and Ft. Bliss coordinated with unit commanders, Consumer Credit Counseling and community consumer services organizations.

Teachers from Texas high schools link with county Extension agents and local credit unions to deliver the *NEFE® High School Financial Planning Program* curriculum enrichment

program provided free of charge by the National Endowment for Financial Education in partnership with the Cooperative Extension System and Credit Union National Association.

Money 2000plus[SM] began in 1996 and continued through 2002, but some counties in 2003 began to make plans to transition to America Saves, a component of Financial Security in Later Life. Better Living for Texans began in 1998 and will continue through 2004. High School Financial Planning began in 1991 and will continue through 2005. Financial Readiness programming at Ft. Hood and Ft. Bliss began in 1999 and continues through 2004. Financial Security in Later Life began in 2002 for a five-year period.

B. Impact of Programs

Home Buyer Education. Program outcome data were collected in Brazos County (Bryan-College Station, Texas) from past participants in a 5-part home buyer education course. 187 participants were contacted to evaluate the program and 62 responded. The survey results demonstrated that:

23% of the respondents had purchased a home since attending the classes
7% had applied for down payment assistance
7% established good credit
15% saved money and developed a budget
23% pre-qualified for a loan
53% decided not to buy a house at the time
92% found the course series very helpful

Building Fiscally Fit Families. The focus of this program in Harris County (Houston, Texas) was to assist families to establish and maintain financial well-being through individual consultation, group methods, short-course, newsletters, seminars, exhibits, information on the web site, involvement and collaboration of task force and community leaders. 13,224 people participated in the program, 815 were contacted to evaluate the program and usable information was received from 543 respondents. The findings showed that:

93% had learned new information
21% had learned new information for training others
84% learned new methods of saving money
69% learned new methods to control spending
81% stated that their habits towards savings and credit had improved

Plane State Jail Inmate Distance Education Program. Program outcomes were reported by Harris County (Houston, Texas) on the financial management component of the program:

28% stated that they learned new information they could use for themselves
75% learned new methods of saving
24% stated that they did not learn new methods of saving
39% stated that they learned new methods of tracking savings
73% stated that they learned new methods of planning bill paying
42% stated that the learned methods to control spending
37% learned “a great amount” about credit
69% said the information on buying a new home was “very” or “somewhat” valuable

Basic Life Skills Classes for Single-Parent Heads of Household. A comprehensive educational program for female householders with children was conducted at the Helping Hands Center, a one-stop resource center for families with limited resources in Rockwall County. Sixteen of 28 persons responded to a post-test evaluation with usable information. 88% of the participants indicated that the information and class activities had been very helpful. Changes that respondents reported making included: tracking spending practices, budgeting, planning meals in advance, and using a grocery list to shop.

Workforce Investment. In Johnson County, Extension collaborated with the Cleburne Workforce Center to conduct weekly seminars on job skills and career transitions. From January through May 2003, the weekly seminars had a total attendance of 436. Seminars from January through March were conducted as preparation for a major Jobs Expo in early April, which drew 708 job seekers, 43 volunteers, and 21 employers; 507 job seekers completed evaluations indicating that 191 job seekers received 373 job offers at the Jobs Expo, and 104 job seekers not receiving offers at the Jobs Expo were invited to 175 personal interviews at a later date. A total of 592 resumes were requested from 271 job seeks at the Jobs Expo.

High School Financial Planning Program. The High School Financial Planning program is evaluated through a national impact evaluation, conducted most recently in 1998 and again in 2003. Eighty-six percent of the students surveyed demonstrated an increase in financial knowledge or behavior when dealing with money. A three-month follow-up of the same students showed that 58 percent had improved their spending habits, and 56 percent had improved their savings habits, with 39 percent reported starting a savings account. This is noteworthy because research indicates that those who are taught to save as teens will also save more money during adulthood.

Better Living for Texans. The Better Living for Texans (BLT) program was a series of 5 to 6 lessons that included a component on food resource management. During the 2002-2003 program year, BLT was conducted in 226 lead counties across Texas and reached 175,885 direct educational contacts. Audience composition was 35% Caucasian, 15% African American, and 49% Hispanic. Results from a statewide telephone survey administered to 381 individuals revealed that more than 55.4% reported that their food stamps were lasting longer after they started to participate in BLT programs than they had prior to participating in BLT. Eighty-eight percent reported that they compared prices "always or most of the time" after participating in BLT, compared to 40.4% of the time before participating in BLT, thus being able to feed families nutritious foods in a more economical manner. [Note: See complete report in the State TCE-TAES Plan of Work Program 7: Better Living for Texans.]

Financial Readiness Program. Army families have met many challenges this year and hardships that can create financial burdens. Extension has provides program in the Financial Readiness Program by providing classes that have helped prepare soldiers and their families for deployments and the financial hardships that it can create. Extension has also prepared and presented budgeting classes for the family members left at home to assist them with financial concerns. Agents at Ft. Hood continue to train NCO's to teach financial responsibility to soldiers and their units. Agents at Ft. Hood and Ft. Bliss also provide basic financial education as a part of the 1St Termer program, an educational program to help new soldiers and their families get started on the right financial track. Agents at both installations also provide educational programming on budgeting, insurance, and protection against scams.

Summation of contact data for 2003 indicate that:

63,714 contacts were served by group methods
115,923 contacts were served by individual methods
294,507 contacts were served by direct methods through Better Living for Texans
305,905 contacts were served by mass media (newsletters)
110,906 contacts were served by volunteer leaders

890,952 total Texas contacts served through Better Living for Texans, Financial Readiness Military, High School Financial Planning Program, Consumer Education Programs, Home Buyer Education, and other specific targeted financial management education programs

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program 9, Financial Management Education.

C. Sources of Federal Funds
TCE: Smith-Lever and State Matching
TAES: None

D. Scope of Impact
Multi-State Extension – HSFPP Program – All States
BLT - WS, OH, CO
Financial Security in Later Life (national initiative) - All States

State TCE Plan of Work Program 10: Parenting and Child Care
Key Theme: Parenting, Child Care/Dependent Care

A. Description of Activity

As family life continues to undergo dramatic changes in the United States, the need for educational resources and training programs to support families (and professionals who work them) is very critical. Recent trends, such as the rise in single-parent, dual-income, and father-absent families, as well as the increase in grandparents raising grandchildren, have tremendous implications for the well-being of America's children. According to recent statistics, approximately 26% of today's children live in single-parent households, where they are much more likely to experience poverty. Over 4.5 million infants, young children, and teens live in households headed by a grandparent (U.S. Bureau of the Census, 2000). Father absent families are at an all-time high, with roughly 24 million children living apart from their biological fathers. Children who group up with absent fathers are at a greater risk for poverty, school failure, child abuse, suicide, criminal behavior, emotional and behavioral problems, early sexual activity, and drug and alcohol abuse. These risks diminish substantially when children grow up with an active and loving father in the home (Lamb, 1997).

Child maltreatment rates in the U.S. remain extremely high. Recent statistics indicate that three million referrals concerning five million children were made to Child Protective Service (CPS) agencies in 2000 (U.S. Department of Health & Human Services, 2002). Of these reported cases, approximately 879,000 children were found to be victims of child maltreatment, with the majority falling under the category of child neglect (63%). Eighty-four percent of substantiated child maltreatment cases occurred at the hands of a parent or parents. In Texas, Child Protective Services investigated 111,970 cases and confirmed 42,813 cases of child abuse and neglect in 2001 (Texas Department of Protective & Regulatory Services, 2001). Parenting programs that provide education and skills training to parents covering a variety of topics (e.g., child development, communication, nutrition, health and safety, etc.) have been demonstrated to be effective in reducing child maltreatment rates (Bloom, 1996; Reppucci et al., 1997; U.S. Department of Health and Human Services, 2001b; Willis et al., 1992).

As families have changed over the last several decades, so has the demand for quality child care. According to labor statistics, 65% of women with children younger than 6, and 78% of women with children ages 6 to 17 are currently working outside the home. In 2001, 61% of children from birth through age 6 received some form of child care on a regular basis from persons other than their parents (Federal Interagency Forum on Child and Family Statistics, 2002). The Texas Workforce Commission estimates that there will be a need for over 260,000 child care employees in the state of Texas by 2006, an increase of over 50,000 positions since 1996. Having a well-trained child care workforce is essential to providing the high quality child care that children need to develop physically, socially, emotionally, and cognitively.

Texas Cooperative Extension's Family Development and Resource Management Unit is committed to providing educational programs to support and strengthen Texas families. In the areas of parenting, child care, and dependent care, Texas Cooperative Extension offers a wide range of programs and resources to citizens across the state. Programs and resources include train-the-trainer workshops for professionals and volunteers, multi-session parent education workshops, 1-2 hour lectures, satellite and other distance education workshops, self-study child care training guides, internet resources (e.g., fact sheets, research briefs, trend data, links to

juried websites), and newsletters. In addition, over 300 programs related to parenting, child care, and dependent care can be accessed through Extension's Educational Resource Library at Texas A&M University.

B. Impact of Programs

Performance Goal 5.2.1: To annually increase the incidence of caring communities resulting from non-formal education programs in which CSREES partners and cooperators play an active research, education, or extension role.

Child Care Worker Training Programs. Current and/or prospective child care providers, managers, and early childhood educators can enhance their knowledge and skills related to the care and education of children through regional child care conferences, county workshops, satellite trainings, newsletters, and self-study courses. Providers completing the above programs can acquire the necessary annual training hours and continuing education units determined by the Texas Department of Protective and Regulatory Services.

Dependent Care Programs. Texas has the fifth largest population of older adults in the United States. Texas Cooperative Extension has developed numerous programs and resources to assist professionals, family members, and older adults in making decisions about quality dependent care. Programs include regional eldercare conferences, Project Oasis (a program designed to train older adult volunteers as paraprofessional mental health counselors to work in nursing home settings), workshops on fall prevention, Alzheimer's disease, health, nutrition and safety for older adults, and inter-generational programs involving 4-H and other youth.

Indicator 5.2.1d: The total number of child care/dependent care providers completing non-formal education programs.

Target audiences for child care programming include adults and teens providing care for children birth through age ten in family, center and school-aged settings. Target dependent care audiences include adults and teens providing care for adults and children who are unable to provide some portion of care for themselves due to illness or age-related disabilities. Programs and resources are accessible to target audiences regardless of gender, marital status, family status, race/ethnicity, income level, educational level, or sexual orientation. It is estimated that 70% of this audience falls under the category of "low-income."

	Child Care	Dependent care
Providers attending classes	14,545	21,694
Individual contacts	14,790	19,526
Contacts via newsletters & self-study guides	18,488	35,546
Volunteers trained	255	1,666
Individual contacts by volunteers	2,012	88,239
Individuals attending volunteer led programs	3,546	17,089

Totals	**53,636**	**183,760**
Combined Total	**237,396**	

Indicator 5.2.1e: The total number of dependent care providers completing non-formal education programs who plan to adopt one or more new principles, behaviors, or practices after completing one or more of these programs. (See below)

Indicator 5.2.1f: The total number of dependent care providers completing non-formal education programs who actually adopt one or more new principles, behaviors, or practices within six months after completing one or more of these programs. (See below)

Selected Highlights

Dependent Care. Texas Cooperative Extension collaborated with Texas Organization of Residential Care Homes, local Alzheimer's Associations, AAA's, and religious organizations to conduct twelve continuing education conferences focusing on care giving, fall prevention, Alzheimer's care and memory. The principal fields of participants were nursing, social work and various allied health assistants and family caregivers. The number of participants was 1,056, of which 507 were Caucasian, 331 African American, and 218 Hispanic/Latino.

Child Care. District 5 Child Care Conference. 300 child care providers and managers attended a regional conference hosted by Texas Cooperative Extension at Stephen F. Austin University. Participants received contact hours required by the Texas Department of Protective and Regulatory Services to maintain their licenses.

District 9 hosted the 7th Annual Child Care Provider/First Annual Adult Caregiver Conference with over 500 in attendance. The theme of the conference was, "Quality Care for Children and Adults." As a result of the conference, child care providers and adult caregivers received CEUs and 7.5 contact hours necessary for meeting required state training guidelines.

Family Awareness Child Care Conference (Guadalupe County). 274 child care providers and early childhood educators attended an all-day conference designed to enhance their caregiving practices.

Harris County Child Care/Parent Short Courses. 1,576 child care providers and parents participated in short courses designed to improve their knowledge of caregiving practices related to children.

Performance Goal 5.2.2: To annually increase the incidence of strong families resulting from non-formal education programs in which CSREES partners and cooperators play an active research, education, or extension role.

Parent Education Programs. Texas Cooperative Extension offers a wide range of programs and resources to support parents, and professionals and volunteers who work closely with parents. Extension partnered with the Texas Department of Health in 2003 to provide train-the-trainer parent education workshops and parenting curricula accessible through the Extension Resource Library. In addition to the above efforts, resources and materials have been developed to reach fathers, teen parents, and grandparents raising grandchildren. 1-2 hour workshops are available to community agencies and parents on numerous topics impacting parents (e.g., Attention Deficit Hyperactivity Disorder, teasing and bullying, discipline, parental involvement

in children's education, early brain development, self-esteem, father-involvement, nutrition for infants and toddlers, etc.).

Indicator 5.2.2a: The total number of people completing non-formal education programs on parenting.

Individuals attending parenting classes/programs	33,809
Individual contacts (e.g., phone, e-mail, office)	40,881
Contacts via newsletters & self-study guides	47,582
Volunteers trained in parenting programs	1,591
Individual contacts by volunteers	81,840
Parents attending volunteer led parenting programs	19,566
Total	**225,269**

Indicator 5.2.2b: The total number of people completing non-formal education programs on parenting who plan to adopt one or more parenting principles, behaviors, or practices after completing one or more of these programs. (See below)

Indicator 5.2.2c: The total number of people completing non-formal education programs on parenting who actually adopt one or more parenting principles, behaviors, or practices within six months after completing one or more of these programs.

Selected Highlights

Fathers Reading Every Day (24 Texas counties). Over 500 fathers, grandfathers, and male mentors (and over 600 children) from 24 Texas counties participated in the *Fathers Reading Every Day* (FRED) program in 2003. FRED is a family literacy program developed by Texas Cooperative Extension in which fathers, grandfathers, and other positive male role models read to their children every day for four-weeks. Results from a recent evaluation study of 200 fathers demonstrated significant improvements from pre to post in many areas, including the amount of time fathers spent reading to their children, number of books read during a typical week, level of involvement in their children's education, amount and quality of time spent with their children, and level of satisfaction with the father-child relationship. There was also a significant increase from pre to post in the number of fathers obtaining a library card. Other significant findings from FRED participants include:

61.4% reported that FRED "Increased the time I spent with my child."
58.7% reported that FRED "Improved the quality of the time I spent with my child."
57.2% reported that FRED "Helped me become more involved in my child's education."
66.2% reported that FRED "Increased my satisfaction level as a parent."
70.3% reported that FRED "Improved my relationship with my child."

In open-ended responses, many fathers indicated that they noted improvements in their children's vocabulary, reading ability, and interest in books as a result of participating in FRED. Some fathers even noted improvements in their own literacy skills.

Parent Education Workshop: Supporting Families (7 Texas Counties). TCE organized and conducted eight train-the-trainer parent education workshops in seven different locations throughout the state of Texas. Trainings were conducted with professionals and volunteers in the cities of Dallas, Tyler, Corpus Christi, Kaufman, Gainesville, Houston, and Roma. The total number of community professionals and volunteers trained at the workshops was 488. A variety of agencies were represented at the workshops, including Texas Cooperative Extension, Texas Education Agency, Texas Department of Health, Early Head Start, Head Start, Advance, Dallas Independent School District, East Texas Crisis Center, Parents Anonymous, Even Start, and a number of child care center and day care programs.

Content covered included: child development, nutrition for the young child, communication, discipline, self-esteem, and health and safety issues.

Based on an evaluation study conducted with 51 parents who attended subsequent workshops taught by those who were trained, it appears that the parenting classes had a very positive effect on specific parenting practices. Parents who attended parenting classes:

- Were more confident in their parenting skills.
- Complimented, encouraged, & praised their children more frequently
- Criticized their children less often
- Communicated their expectations to their children more clearly
- Made a greater effort to listen carefully to their children
- Set and enforced limits more consistently with their children
- Became more involved in their children’s child care and/or school-related activities
- Relied more on positive disciplinary/guidance techniques (e.g., redirecting their children, ignoring undesirable behavior, and reasoning with them)
- Increased their knowledge of the harmful effects of giving honey to children under two years of age.

2003 Building Strong Families Conference (Lubbock). 680 parents participated in the Building Strong Families Parenting Conference held in Lubbock, TX. Parents were able to select from 30 sessions dealing with a variety of parenting issues. Conference evaluations were done on site with participants, exhibitors, speakers, facilitators and BSF Board. Comments indicated that the conference was the best ever and was on target in providing information to address major concerns of parents. Evaluation data from the follow-up will be available in early 2004. Participants at the conference came from very diverse backgrounds, including over 50% Hispanic/Latino.

Parenting for Incarcerated Parents (Dallas, Collin, & Harris Counties). Over 300 male and female inmates attended parenting classes in local prison systems taught by Texas Cooperative Extension Family and Consumer Science agents. Topics included communication, discipline, self-esteem, peer pressure, responsible decision making, and anger management.

Grandparents Raising Grandchildren Conference (Nueces County). 324 grandparents/guardians attended a grandparents raising grandchildren conference in Nueces county. Participants attended general and concurrent sessions on a host of topics of interest to grandparents who have taken on the responsibility of raising their grandchildren.

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program 10, Parenting and Child Care.

C. Source of Federal Funds

TCE: Smith-Lever and State Matching
TAES: None

D. Scope of Impact

TCE: State Specific
TAES: None

Integrated research and Extension - This integrative program combines staff from TCE (Extension) and the Texas Department of Health (TDH), Baylor College of Medicine, Texas Department of Protective and Regulatory Services, and numerous county level collaborations. Extension staff include: five specialists and numerous agents working in Food and Nutrition as well as Family Development and Resource Management. Staff from support agencies include: licensed nurse, county nurses, caseworkers, licensing agents, and faculty.

State TCE Plan of Work Program 11: Life Skills Education Development
Key Theme: Youth Development

A. Description of Activity

Youth issues were identified by Texas residents as a high priority for Extension programming. Areas of focus identified by 209 counties from the most recent Texas Community Futures Forum include ethics, morals, character, pregnancy, drug use, education, and job preparation.

Texas 4-H offers nine areas of program delivery to meet the needs of a diverse state. A comprehensive urban plan includes faculty from the 20 most populated Texas counties who work cooperatively toward a consistent program directed to serve the needs of urban youth. Furthermore, focused efforts are directed toward traditionally under-served clientele and accommodations were made to meet the needs of the disadvantaged.

Texans Building Character, 4-H Leadership Development , Strengthening Our Capacity to Care, Workforce Development, Conflict Resolution (Talking with TJ) and 4-H Curriculum Development through Texas 4-H Project Teams were addressed. Curriculum was aligned to meet the Texas Essential Knowledge and Skills (TEKS) as identified by the Texas Education Agency (TEA). During 2003, TEKS components continued to be valued within 4-H curricula as TEA has moved toward requirements for Texas schools to assess the knowledge and skills (TAKS) gained by youth. Internal and external linkages were formed with numerous agencies, including: Civic and Community Organizations, Extension Program Council, Family and Community Education Groups, Juvenile Probation System, Parks and Recreation Departments, Universities, Schools, Corporations, Philanthropy Foundation, and other youth serving agencies as appropriate to this performance goal.

B. Impact of Programs

Texans Building Character was initially brought forward through special state legislative initiative funding. Character Education was identified by Texas residents, during the Texas Community Futures Forum, as a high priority of need for Texas children. During 2003, 125,547 youth participated in Character Education project work. Distinguishable results from around Texas include:

> Wilson county documented a 61% change in youth participants concerning their appreciation for doing good for their community and helping people who are in need.
>
> In Austin County, elementary school student participants increased their ability to make positive decisions by 81%, and 75% of the participants learned the importance of respecting a person's individuality and the right to be different.
>
> Dickens County reported that 90% of their school aged participants indicated an increased appreciation for respectful behavior.

Travis County Faculty members continued their successful, Celebrate Character Program. The urban-focused educational events are related to fostering character development in young people through a variety of methods. Celebrate Character! has provided training for the Travis County Extension Agents, 4-H CAPITAL staff and ENP-Y staff, and child care providers, as well as volunteers representing 4-H and other youth organizations such as Austin Parks and Recreation Department, churches, schools, and City of Austin Summer Youth Employees

Strengthening Our Capacity to Care (SOCC) is a program designed to be a prevention and intervention program for first time juvenile offenders. As a collaborative effort between TCE and the Juvenile Services Department, this programs goals focus is to reduce the rate of recidivism among first time offenders. Typically, first time offenders, repeat youthful offenders, and youth-at-risk have been involved. Referred offenders parents are required to be involved in Parent Enhancement Classes. The resource "Things Teenagers Need to Succeed" from the SEARCH Institute's work on 40 developmental assets was used to provide the parents the necessary skills to build assets and raise confident, caring young people. Summative evaluation results of the recent county based SOCC projects indicates that only 26% of participating youth have re-offended on any level, compared to the state recidivism rate of 52% for youth. Involvement by both parents and youth increased the youth's participation in positive activities, such as 4-H and workforce preparation. The program also increased the youth's knowledge of specific 4-H projects by applying skills gained to self and family. By participating in these projects, the youth acquired better nutritional attitudes, academic achievement and life skill development (i.e. leadership, volunteerism, and character education). 2003 highlights from Tyler County indicate the only 12 % of the program participants were repeat offenders as compared to the state average. Encouragingly, the Tyler program also resulted in a 50% school attendance increase for program participants.

In rural Hutchinson County, a continued project between Cooperative Extension Faculty and Frank Phillips College provides a distance learning center focused on workforce preparedness and career enhancement. In excess of 10,000 Texas youth participated in a Workforce Preparedness project. Eastland County focused on creating partnerships to offer GED classes, to develop a better educated workforce. To date, 292 students have participated in the classes with 55 completing all components of the program and graduating.

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program 11, Life Skills Education Development.

C. Source of TCE-TAES Federal Funds

TCE: Smith-Lever and State Matching
TAES: None

D. Scope of Impact

Multi-State Extension – FL, VI, LA, and WS
Multi-State Research – None

Integrated Research and Extension - Texas 4-H has a focused effort of youth research. During 2001, two grants were solicited through the National Science Foundation to enhance research and establish a pattern of funding to enable the creation of a Center for Youth Research. Texas 4-H Faculty are actively involved in University based committees which focus toward building partnerships between Teaching , Research, and Extension. One committee meets monthly to discuss funding opportunities and areas where Extension and Research can partner on projects.

State TCE Plan of Work Program 12: Volunteer Development
Key Theme: Youth Development, Community Development

A. Description of Activity.

Mobilizing and organizing a strong volunteer base is essential to the mission of Texas Cooperative Extension. TCE has the largest volunteer program of any agency in Texas. But with increasing competition for resources, funding, staff and time, sound decisions regarding volunteer recruitment and management will be crucial to sustaining current programs, partnerships and developing new opportunities.

All research concerning agencies of the future leads us to know that expanding the outreach and programming components through all volunteer efforts is essential. Volunteers are the real heart and hands of many different Extension programs, extending the reach into every community and every neighborhood in Texas. Extension volunteers help people to gain knowledge and skills that will benefit them for life. And, in return, volunteers have the satisfaction of knowing they're making a difference for their friends and neighbors. Much of the work Extension volunteers do grows out of their interests and experiences, but they also receive training from educators from various disciplines. Thus volunteers improve their own skills while helping others.

Youth Protection Standards. The Volunteer Qualification Task Force in Texas was developed in May of 1997 to review the policies and procedures for recruiting training and maintaining volunteers. The committee included volunteers, County Extension Agents, Specialists and an Administrator. Special focus was placed on the safety of the youth involved in the Texas 4-H Program. In 1990, Myron Johnsrud, Administrator of Extension Service of USDA, encouraged each state to have a policy which defines management practices related to prevention of child abuse and the management of volunteers. Additionally, he asked for screening procedures for salaried and volunteer staff which includes background checks; training on child abuse identification and reporting; and written guidelines for all salaried and volunteer staff who work directly with youth. In 2002, Texas Cooperative Extension Districts 1, 2, 3 and 4 began the pilot stage of screening qualifications of volunteers. In 2003, all volunteers in Districts 5, 6, 7 and 8 were included in the Youth Protections Standards program, and in 2004, all volunteers in District 9, 10, 11 and 12 will be phased in. All criminal background checks are completed through the Volunteer Center of North Texas.

Clothing Master Volunteer. A statewide MCV training is held annually, attracting a wide number of counties around the San Antonio area. In 2002 and 2003, over 30 counties, representing eight Extension districts, were involved in MCV training. The three-day training is co-sponsored with the Creative Inspiration Exhibition, an event drawing over 3,000 individuals as well as sewing and industry experts from across the U.S. The Master Clothing Volunteer (MCV) program involves individuals with sewing expertise who enthusiastically want to learn how to teach others to sew. The program covers 10 topics in pattern and fabric selection, interfacing, sewing equipment, pattern fitting and alteration, cutting, marking, construction and pressing, as well as how to start a home-based sewing business or develop job skills for employment. Volunteers receive training in teaching others and individualized assistance through 24 hours of instruction and then contribute 50 hours of service through the local county

Extension office. The program targets individuals with little or no sewing experience and helps the individual develop skills for constructing and evaluating apparel and home interiors products.

Texas 4-H Project Teams. Texas 4-H Project Teams(14) give direction to the youth project work conducted in Texas. Project teams consist of youth and adult volunteers, county Extension agents, subject matter specialists and administrators. The main objectives are to provide consistent and specialized support and direction to designated project areas; evaluate existing projects and expand the learning opportunities for 4-H youth; develop a base of current project resources including curricula, training, etc; reflect youth development priorities and competencies through project experiences; and develop financial and human resources for the designated project areas.

4-H Master Volunteer. 4-H Master Volunteer programs empower adult volunteers and have increased the impact through a broadening of available human resources. The key to a successful master volunteer program is primarily centered around a strong volunteer project base. The purpose of the 4-H Master Volunteer program is to (1) teach 4-H project subject matter to members and volunteers in the county, (2) provide support to 4-H members and volunteers, and (3) to give leadership to learning opportunities for members, parents, and volunteers in the county. These master volunteers help 4-H members realize the benefits of developing a sound well-rounded project.

Junior Master Gardener. This program is an international youth gardening program that grows good kids by igniting a passion for learning, success, and service. The JMG national program office is at Texas A&M University and currently has programs in all 50 states, 10+ countries, and has collaborative partnerships with 30 land-grant university systems. The program is utilized as a 4-H project for youth and is modeled after the highly successful adult Master Gardener program. Children complete learning experiences and community service projects and are rewarded through certification.

Texas Master Gardener. This program has developed over the last two decades. Master Gardeners are committed to providing high quality educational programs about horticulture and the environment in Texas communities and neighborhoods. A love of gardening and search for knowledge are the catalysts by which Texans from every walk of life enter the program. Master Gardeners are now navigating the worldwide web to extend information delivery and problem solving to Extension clientele. Through web based programs they are assisting in answering thousands of home gardening questions each year. Master Gardeners are certified every two years by fulfilling 12 hours of training and 12 hours of volunteer service.

Texas Master Naturalist. The mission of this program is to develop a corps of well-informed volunteers to provide education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities. Texas Master Naturalist volunteers receive 40 hours of in-depth training in wildlife and natural resource management, customized to focus on their local ecosystems. In return, volunteers provide at least 40 hours of service in the form of community education and demonstration projects, while pursuing a minimum of 8 hours of advanced training in areas of special interest. Texas Master Naturalist training is provided by educators and specialists from universities, agencies, nature centers, museums, and other organizations that donate their services. The Texas Master Naturalist curriculum is developed by experts and provides a standardized base of knowledge and skills for all volunteers across the state. The Texas Master Naturalist volunteer program is sponsored by the Texas Cooperative Extension and the Texas Parks and Wildlife Department and supported by more than 180 local organizations.

Master Marketer. This program combines three successful concepts –intensive education, master volunteers and leadership of marketing clubs. Producers are trained in advanced risk management and marketing techniques during an intensive program and then extends that knowledge to other producers by providing leadership for marketing clubs in their home counties. Six hundred and thirty producers have now graduated from the Master Marketer Program through 2003.

B. Impact of Programs

Youth Protection Standards. This programming effort has reached 10 of the 12 Texas Cooperative Extension districts, with the remaining districts receiving training in Spring 2004. Clientele have received this training in a very positive manner. Many volunteers involved in Extension programming have previously been screened by employers, churches and youth organizations.

Master Clothing Volunteer. MCVs are involved in women's prisons teaching skills for personal success with quilting, team work, planning, organization, and providing needed clothing and accessories to single parents, the elderly, and contributing to community heritage. MCVs teach youth and 4-H'ers, serve as leaders, assist in schools, and collaborate with a variety of organizations and agencies, such as housing authorities, community action groups, and Head Start. They conduct sewing camps, demonstrations, and recruit other individuals to contribute to the social value of the community. In addition to knowledge and sewing skills, the Master Clothing Volunteer program gives clients self-confidence and a sense of worth that they can complete a worthwhile project. The Texas MCV program serves as a resource to other state's Extension organizations through its innovative use of sewing, textile and consumer skills and community partnering to reach committed volunteer.

Texas 4-H Clothing Board. This project team coordinated the Texas 4-H Clothing and Textiles Dallas Study Tour which included learning about: Wholesale Fabrics, converter-jobber in the clothing industry, Wholesale Trading, Personal Shopper, merchandising and marketing, Quality control, cutting, marking and designing the fashion industry vintage clothing, costuming for theater, 4-H clothing projects, mass customization, clothing for the homeless, there were 38 participants. The 4-H Blankets

Across Texas project made and distributed 2061 blankets, valued at approximately $11, 000. Blankets were given to hospitals and clinics, homeless shelters, abuse centers, pregnancy clinics, mission center, Independent School Districts activities supportive of adolescents, birthright center. 4-Hers also recruited senior citizens in helping to make the blankets for distribution. Volunteers serve as judges as well as paper work, door monitors, tabulators, line-up monitors, and registration for state clothing activities and contest. 4-H Fabric and Fashion Design Workshop was conducted in the West Region in Midland. Two volunteers and former board members taught the workshop, one was from Lubbock and the other from Lockhart.

4-H Consumer and Financial Team. In 2003, this new team reviewed the curriculum lesson as to the appropriateness for today's 4-H member which included housing, entrepreneurs, consumer and financial curricula. They determined what changes should be made to the lessons to make it useful for 4-H leaders, agents and 4-H members.

4-H Record Book Master Volunteers. Volunteers serve in both a project leader and master volunteer role in the areas of record keeping and record books. In 2003, 19 Master Volunteers and 191 project volunteers gave over 7900 hours to this project area valued at over $130,600.

4-*H Method Demonstration Master Volunteers* **.** Volunteers serve in both a project leader and master volunteer role in the areas of method demonstrations and illustrated talks. In 2003, 14 master volunteers and 35 volunteers gave over 1500 hours to this project valued at over $63,000.

Texas 4-H Livestock Master Volunteers. A total of 88 4-H Swine Master Volunteers have been trained. More importantly 41 have completed their certification form and required hours. These individuals have provided over 4,500 hours to the program and reached 12,434 people. Their payback hours included such activities as validation committees, educational programs, project supervision, project selection, record keeping, facility upkeep, artificial insemination, breeding and farrowing, Ag. boosters, showmanship clinics, assisting new families, club manager work, judging project shows, and elementary school programs. The certified master volunteers revealed a significant increase in their subject matter knowledge of the swine industry, their ability to carry out leadership responsibilities, and in their ability to effectively plan 4-H swine project activities.

Junior Master Gardener. Data supporting this project include:

*JMG Website reaches an average of 28,000 user sessions per month in 2003
*JMG National Electronic newsletter for 2003 – 18,000 subscribers
*Distribution of 85,000 curriculum guides since program inception in 1999
*12,000 teachers/leaders trained since program inception in 1999
*Distribution of 220,000 Mini JMG Grow Books per week for 8 weeks through a national marketing campaign in Carl's Jr. and Hardee's Restaurants kids meals in a 5 state region.

The JMG program has had several doctoral and masters students complete research projects evaluating the JMG program. These have been submitted for submission in national peer-reviewed journals.

Texas Master Gardener. This volunteer development program contributes $5.3 million in volunteer service to the State of Texas through its 5,300 Master Gardeners in 110 counties. The economic value of Master Gardeners service expands the human capacity of Texas Extension by 16 percent through educational projects in youth gardening, community beautification, environmental quality, and consumer horticulture.

Texas Master Naturalist. The Texas Master Naturalist program is a partnership between TCE and Texas Parks & Wildlife -- 2003 was the 5th year of this partnership. This award winning program has trained over 2,000 adult volunteers in 19 local chapters. In turn, these volunteers have committed over 163,000 hours of service for natural resources outreach and local community projects. Through this program over 350,000 youth, adults, and private landowners have received education, outreach, or technical assistance. Over 30% of these outreach and education contacts were direct "hands-on" group instruction by Master Volunteers in the field and classroom. A pre- and post-program evaluation conducted during 2002-03 demonstrated that volunteers increased their knowledge of natural resources by 26.4% as a result of training, and this level of knowledge gain was retained for at least 6 months. According to US Bureau of Labor Statistics, this volunteer effort is valued at more than $2.7 million, and equivalent to 17 Full Time Employees.

Master Marketer. Participants from the first eleven classes indicated in a 2 ½ year post survey that they are increasing their returns an average of $32,280 per year based on what they had returned. The estimated annual impact for all graduates now exceeds 15.2 million dollars per year with the cumulative returns since the program inception (1996) now approaching 75 million dollars. The impact of participating in marketing club activities is currently being evaluated. Master Marketer graduates have been involved in the formation of over 75 marketing clubs since the beginning of the program. Each club started is expected to have a finite life of 1 -2 years, however, a number of the clubs choose to continue operating.

Output Indicators

Texas Cooperative Extension - 2003 Volunteer Development

279,306	Volunteers Trained
3,623,599	Individual Contacts by Volunteers
1,465,533	Attendance at Group Methods Conducted by Volunteers
$849 million	Value of Volunteer Time

Source: Bureau of Labor Statistics, Independent Sector, 2002 Data.

Youth Protection Standards. Many resources have been created to support this program Those include: reference guide, electronic presentations, videos, and Spanish translation of enrollment forms and information. This program has screened and qualified 4,954 volunteers to date. These individuals are involved in all Extension disciplines and programs in a direct volunteer role. A 6 % red flag rate (304) has occurred as a result of the criminal background checks. This is consistent with the state average for red flag**s** regarding volunteer background checks.

Master Clothing Volunteers. In its 11th year, the program continues to attract volunteer interest both in and out of Texas. Within 31 Texas counties implementing the MCV program 2002-2003, 1,120 MCVs have been trained. These individuals have made over 2,500 contacts while repaying their 50 volunteer hours. MCVs have reached over 11,800 individuals in trainings they have conducted in 18 months. These efforts represent more than $403,000 in 18 months contributed in time and effort to the citizens of Texas.

Texas 4-H Project Teams. The Texas 4-H Clothing Board (project team) has 49 members, 27 adults (7 of these are college students who were on the board as teens and elected to stay on as adult members) and 22 4-Hers ages 14-18. For many years they have been an exemplary project team setting the standard for other.

The Texas 4-H Livestock Master Volunteers. Three key groups support the education of youth and adults in the swine, beef, sheep and goats. These project teams give direction to youth leadership tours, master volunteer trainings and support and other learning strategies. These groups are comprised of youth and adult volunteers, Extension faculty, commodity groups and key donors. The certified swine master volunteers revealed a significant increase in their subject matter knowledge of the swine industry, their ability to carry out leadership responsibilities, and in their ability to effectively plan 4-H swine project activities. Outcome data will be available for the Beef and Goat Master Volunteer programs in 2004.

4-H Record Book Master Volunteers. Nineteen active 4-H Record Book Master Volunteers trained and assisted 102 4-H Volunteers in record keeping and 4-H Record Books. Those 19 Master Volunteers and 102 4-H volunteers taught 280 4-H members about record books. In addition to Master Volunteers and Volunteers trained by Master Volunteers, another 89 volunteers were trained in record keeping and assisted 228 4-H members with record keeping skills.

4-H Method Demonstration Volunteers. Fourteen active 4-H Method Demonstration Master Volunteers trained and assisted 35 4-H Volunteers in the field of method demonstrations. Those 14 Master Volunteers and 35 4-H volunteers taught 142 4-H members about method demonstration or illustrated talks. Those 142 4-H members participated on the district level or higher with their demonstrations. The 4-H Method Demonstration Master Volunteers contributed 588 hours of service that has a monetary value of $9,725.52. The other 35 volunteers that taught lessons and assisted youth in preparing method demonstration, as a result of the Master Volunteer's assistance, contributed 927 hours of service with a monetary value of $15,340.85. An additional 102 volunteers, who were not trained by Master Volunteers or did not participate in the Master Volunteer Programs, also contributed 2,320 hours of service having a monetary value of $38,372.80.

Junior Master Gardener. Data supporting JMG include:

*Reached 980,000 children nationally in 2003 with 48% ethnic minorities

*Texas JMG Program in 2003 had 557 registered groups working toward certification (representing 20,137 youth – 52% ethnic minorities) and over 243,000 youths reached through outreach projects

Master Marketer. Six hundred and thirty producers have now graduated the Master Marketer Program through 2003.Currently, 37 marketing clubs are still active.

Outcome Indicators

Master Clothing Volunteers. Individuals are taught how to sew, mend, alter, or purchase quality family clothing. Some have taught quilting—a heritage art. Some volunteers and clients have started their own businesses or obtained jobs related to apparel construction because of the MCV program. Innovations in fiber and textile production, engineering, computer technology, machine embroidery equipment and computer-assisted design (CAD) are creating a plethora of opportunities for skilled individuals to achieve business success with sewing knowledge.

4-H Swine Master Volunteers.

✓50% change in knowledge of swine industry
✓48% increase in ability to carry out leadership responsibilities as a volunteer
✓54% increase in ability to better plan 4-H Swine Project activities.
✓32% increase in ability to lead others
✓36% increase in ability to adjust to new situations.
✓22% increase in ability to work well with others.
✓20% increase in ability to work independently.
✓22% increase in conflict resolution.
✓44% increase in knowledge level that the 4-H Swine Project provides a safe, wholesome product for consumers.
✓36% increase in the understanding of how to follow labels carefully for feed additives, and drug or chemicals used in the swine project.

4-H Record Book Master Volunteers. A majority of state winning record books come from the North Region which has the only Record Book Master Volunteer Program. This region consistently produces youth with excellent record keeping skills and high quality record books. To support this master volunteer base they have a strong volunteer leader base.

4-H Method Demonstration Master Volunteer. As a result of the work of project leaders and master volunteers in this area one can see an increase in the number of high quality demonstrations, enthusiastic youth wanting to do a method demonstration, and a high success rate at state competitions.

Master Naturalists. A pre- and post- program evaluation conducted during 2002-03 demonstrated that volunteers increased their knowledge of natural resources by 26.4% as a result of training, and this level of knowledge gain was retained for at least 6 months.

Junior Master Gardeners. **Temple ISD –** The **Temple Independent School District** partnered with the **National JMG Program Office** and the **Growing Minds Research Program at Texas A&M University** to conduct formal assessment of the JMG program. The JMG program office provided training and funding to support project and the Growing Minds Research Program provided formal evaluation, development of test instruments, and data analysis. Temple ISD adopted the JMG program as a formal part of their math and science curriculum at the Elementary School Level. There were 1000 youth at 9 Elementary Schools involved in this research study. The following research abstracts were obtained from dissertations and thesis from these studies:

"This research indicated that gardening was successful teaching method for raising science achievement scores for boys in 3rd, 4th, and 5th grades, and for girls in the 5th grade." Klemmer, 2002.

> Klemmer, Cynthia. 2002. Growing Minds: The Effect of School Gardening Programs on the Science Achievement of Elementary Students. Texas A&M University, dissertation.

Tarrant and Bell Counties – Six schools, 920 youth, and sample of student parents in Tarrant and Bell Counties participated in an evaluation of the JMG program. The National JMG Program office provided training and financial support for this evaluation project. The Growing Minds Research Program at Texas A&M University provided the research evaluation of these schools in the areas of leadership, character, and volunteer development. Citations from the findings of these studies are listed below:

"Significant increases from pretest to posttest were found on overall life skills, working with groups scores, and self-understanding for the one-year experimental group. Significant increases were found among the five-month students who became certified Junior Master Gardeners in overall life skills, working with groups scores, self-understanding, leadership , and volunteerism attitudes." Walton-Robinson, 2001.

> Walton-Robinson, Carolyn and J. Zajicek. Growing Leaders in the Garden. HortScience, A Publication of the American Society for Horticultural Science. Program and Abstracts of the 98th International Conference of the American Society for Horticultural Science. 32:3, June 2001.

"Statistically significant differences were found in total parent involvement scores, attitude scores, and behavior scores between each of the income levels categories, each of the ethnicity categories, and each of the education level categories on both the retrospective pretest and the posttest. The findings suggest that school gardening may be an effect tool for involving white and Hispanic parents and those of the lower incomes levels since those groups exhibited the greatest increase in scores." Boyer, 2002.

> Boyer, Roxanne. 2002. The Effects of School Gardening on Parent Involvement in Elementary Schools. Texas A&M University, thesis.

Cameron/Hidalgo Counties – The **Better Living for Texas** program, **National JMG Program**, **Local County Extension Programs**, and the **Growing Minds Research Program** – Department of Horticultural Sciences partnered to provide training and evaluation of the impact of the JMG "Health and Nutrition from the Garden" curriculum on youths. Over 200 youths participated in this research study. The following research abstract was obtained from this study:

"After completing the curriculum, students, regardless of age, ethnicity, or county of residence, had increased knowledge about the benefits of eating fruits and vegetables. Fruit and vegetable consumption also increased significantly from pretest to posttest in that students were reporting eating healthier snacks at the end of the study." Koch, 2001.

Koch, Sharon. 2001. The Effects of Nutrition Education on Attitudes and Behaviors of Children Regarding Fruits and Vegetables. Texas A&M University, thesis.

National JMG Teacher/Leader Evaluation and Survey – the National JMG Program Office, Texas 4-H Office, and the Department of Agricultural Education – Texas A&M University partnered to develop an evaluation survey to be administered on-line to JMG program leaders. A total of 442 respondents completed the web based survey. Salient positive points detailed from the evaluation of the responses are included below:

"Respondents strongly agreed with statements associate with JMG youth participants on general classroom enhancement, interest in science, teamwork skills, performing community service projects, trying fruits and vegetables, increase in personal responsibility, enthusiasm of learning and attitudes on nutrition. Program coordinators also suggested that all eight chapters form the Level 1 curriculum were very useful." Boleman and Cummings, 2002.

Master Marketer. Recent surveys of mature marketing clubs revealed producers are not only gaining knowledge through their participation in marketing club activities, but are also improving their bottom line. More than 400 producers responded to the survey and indicated they had increased their returns an average of $12,399 annually based on the knowledge they had gained through participation in a marketing club.

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program, Volunteer Development.

Sources of TCE-TAES Federal Funding

TCE: Smith-Lever and State Matching
TAES: None

Scope of Impact

Multi-State Extension - OK, AK, LA, MS, AL, TN, KY, VI, WV, NC, SC, GA, FL
Multi-State Research – None
Integrated Research and Extension

State TCE Plan of Work Program 13: Partnerships and Collaborations
Key Theme: Community Development

A. Description of Activity

During the Texas Community Future Forum process, more than 200 counties identified community issues as high priority concerns. These issues ranged from education and youth concerns to parenting and community activities. The citizens of Texas expect groups and individuals to form partnerships and collaborations to solve the problems of youth, families and communities.

Emphasis is being given to groups with interest in community, youth and family concerns. Special attention will be devoted to traditionally under served sectors. Care will be given to meet the needs of the disadvantaged.

576,364 Number of Participants Reached
*25 % of Participants Under served
*This is an estimate based upon the lack of a specific date in this particular area.

Extension activities (focused on Youth, Volunteers and Community Leaders) worked to learn how to form successful partnerships. Extension, communities and school developed opportunities for collaborations.

61,436	Number of Participants Served by Group Methods
120,878	Number of Participants Served by Individual Methods
311,894	Number of Participants Served through Mass Media
4,933	Number of Volunteers Trained
77,223	Number of Contacts by Volunteers

Linkages were made with numerous organizations including Volunteer Leader Organization of Texas, African American and Hispanic Service Organizations, African American and Hispanic Business Organizations, African American and Hispanic Faith-based Organizations, Historically Black and Hispanic Colleges and Universities, Workforce Commission, Majority Minority Public Schools, Civic Organizations, Parent-Teacher Organizations, Hospital Districts, Extension Program Councils, Family and Community Education Groups, Arm volunteers and other youth serving agencies as appropriate to this performance goal.

B. Impact of Programs

As funding becomes more scarce it is more and more important to combine efforts in order to meet the needs of the citizens, and make the efficient use of the dollars given to us by stakeholders, the legislature, and grantees or benefactors.

Examples include:

Community Partnership 4-H Clubs. The success of community partnership 4-H clubs is made possible by matching similar goals and objectives of the Texas 4-H and

Youth Development Program and a community organization. Other key success factors are effective communication between both organizations and marketing results of the partnership to the community.

Community organizations, such as Lions Club, Kiwanis Clubs, LINKS clubs, etc. have partnered in 16 counties to be the sponsors for local 4-H clubs. The membership of these community organizations are bound together by common beliefs and principles that focus on service to youth. As a sponsoring organization for the local 4-H community partnership club, the community organization comes together to provide leadership and resources to the 4-H clubs.

The total enrollment of community partnership 4-H clubs is 861 youth and 75 volunteers in nine counties, representing seven districts.

Rural Passenger Safety. The Rural Passenger Safety Project (RPS) Texas Cooperative Extension, in cooperation with the Texas Department of Transportation, provides valuable traffic safety information and education to people throughout Texas. The goal of the project is to reduce motor vehicle fatalities and injuries and their associated costs.

All team members are certified child safety seat technician/instructors. Two team members are also certified TCLEOSE (Law Enforcement) instructors. This level of expertise allows RPS to conduct child safety seat checkup events and five NHTSA certification trainings, whereby individuals become nationally certified as child passenger safety technicians and instructors.

The primary focus is parents and care givers of young children in rural Texas as well as safety advocates dedicated to child passenger safety issues. Care is taken to meet the needs of traditionally under-served areas of Texas.

Collaborations are with other agencies, both in-state and out-of-state. Included in collaborations are the following agencies: Texas Department of Transportation (TX-DOT); National Highway Traffic Safety Administration (NHTSA Region 6); Texas Department of Health (TDH); Texas Department of Public Safety (DPS); Texas Transportation Institute (TTI); Texas Engineering Extension (TEEX); Texas Municipal Police Association (TMPA); Regional Advisory Councils (RAC); Local and Statewide Law Enforcement; Local and Statewide Fire Departments; Local and Statewide EMS Professionals; Statewide Health Professionals; and Texas Department of Regulatory Services , Child Protective Services.

Texans Building Character. Extension initiated the Texans Building Character (TBC) program based on needs identified in 209 counties in the Texas Community Futures Forum. This program addresses character issues through educational programming based on seven learning models: 4-H, school, youth at risk, livestock, workforce, sports, and community. Since 1999, over 600 county Extension agents have participated in training to implement the TBC programs in their communities.

As Texas communities have recognized the need for character building programs in their communities, over 7,596 volunteers have joined Extension agents to deliver character education programs to over 365,699 individuals in Texas. Another 74,000 contacts were made via newsletters.

Do Well, Be Well With Diabetes. There are 920,000 Texans diagnosed with diabetes, 137,197 of whom are uninsured. An additional estimated 440,512 Texans have diabetes, but they have not yet been diagnosed.

Do Well, Be Well with Diabetes is an educational program to help people with type 2 diabetes learn the skills they need to understand and manage their diabetes, to reduce their risk of complications and to attain their highest possible level of wellness.

People with diabetes must learn how to manage their blood glucose because failure to do so results in a higher risk for complications, and is costly for the individuals, their families, employers, the health care system, and the state. Because of poor access to health care, medications, supplies, and self-care education, people without health insurance are more likely to have complications.

Fathers Reading Everyday (FRED). FRED is being implemented in 46 Texas counties in 2002 (see Figure 1). Twelve counties have completed FRED or have programs in progress (Brazos, Collin, Burnet, El Paso, Jefferson, Kerr, Lipscomb, Tarrant, Travis, Ward, Wheeler, & Williamson). Remaining counties plan to implement the program in the fall with the beginning of the school year. Some counties are implementing FRED more than once during 2002.

Over 300 fathers, grandfathers, and male mentors and nearly 400 children from Head Start, Early Head Start, Even Start, elementary schools, and churches have participated in the FRED program. Results from counties that have implemented and evaluated FRED using the pre and post instrument show that participants spent an average of 8.9 hours reading with their children and averaged 37.5 books over the four-week period

Walk Across Texas. Walk Across Texas is a Texas banner program that promotes health and fitness by challenging and organizing teams to "Walk Across Texas." Contacts in Texas reached 76,425. Volunteers were trained at the number of 1,580. These Walk Across Texas volunteers reached 100,832 individuals. Partnerships and collaborations include local faith-based groups, local and county libraries, hospitals, health clubs, school districts, civic groups, commissioners courts, Extension education groups, 4-H clubs, and other youth groups.

Better Living for Texans (BLT). Better Living for Texans is a contract from the Texas Department of Human Services to teach food stamp and WIC recipients nutrition. In 2003, all Texas counties were involved. There were 455,332 contacts made on this partnership. Also, 5,273 volunteers were trained who, in turn, reached 42,990 individuals. Collaborations and partnerships with this program include, but are not limited to, Texas Department of Human Services, WIC, local school districts, local civic groups, local media, American Dietetic Association, faith-based groups, community centers, health fairs, Vista, and county commissioners court.

Project Hope (Counties served by 1890). Project Hope is a program to partner with the faith-based community for nutrition education with an emphasis in hypertension education. The project reached 7,328 individuals. Also, 309 volunteers were trained. These volunteers reached 6,929 individuals. Partners include: Health Fairs, faith-based groups, mission, civic groups, school districts, and community groups.

Atrazine Abatement Program. The Texas 303(d) list is a list maintained by the TCEQ of water bodies which have exceeded or are threatening to exceed accepted levels of one or more contaminants. Six water bodies which provide public drinking water in the Central Texas Blacklands were placed on this list in the late 1990's due to the presence in these lakes of atrazine, a popular corn, sorghum and turfgrass herbicide.

Upon determining the threat to public water supplies, specialists from the Department of Soil and Crop Sciences took leadership in an educational effort designed to reduce off-target losses of atrazine. They brought a group together which included TCEQ, TSSWCB, USDA-NRCS, US-EPA, other state and federal agencies, industry and agricultural producers to focus on developing BMP's to mitigate the problem of off target atrazine runoff, while allowing continued use of this inexpensive, yet highly effective herbicide. It is estimated that loss of this herbicide would increase weed control costs in the affected areas by approximately $45 million annually. Prolonged presence of excessive concentrations of atrazine in surface water supplies would most likely read to label cancellation and withdrawal of the herbicide from current uses.

A series of field trials were established to evaluate weed control efficacy and potential off-target runoff of atrazine from crop management practices including pre-plant incorporation and surface banding of atrazine, as well as alternative herbicides, transgenic technologies use and the use of grass filter strips. These trials clearly demonstrated that atrazine runoff could be reduced to acceptable levels while adequate levels of weed control were maintained by a combination of BMP's, without having to remove the product from the market and causing economic damages to farmers. Numerous educational meetings communicated the off target atrazine runoff concerns and the efficacy of BMP's in dealing with them to area farmers.

Due to these efforts, atrazine concentrations in the Marlin City Lakes system are now well below levels of concern and the lake is meeting water quality standards associated with atrazine. It has been removed from the 303(D) list for atrazine. Lake concentrations for atrazine in Big Creek Lake near Cooper, Texas has decreased from 3 ug/L in June of 1998 to below detection limits in June of 2003. The other Texas reservoirs (Badwell reservoir, Lavon Lake, Richland-Chambers Reservoir, Lake Tawakoni, and Joe Pool) impacted by atrazine in this effort exhibit similar reductions in atrazine concentrations to levels of 1.0 ug/L or less for all water supplies in June 2003. This information will be crucial in moving to de-list these water supplies from the 2004 303(d) list. Finally, joint TAES-TCE watershed monitoring program for atrazine, simazine, metolachlor, and alachlor associated with the Lake Aquilla project, is showing reductions of atrazine in surface runoff associated with the establishment of cost-share BMP's in the watershed. This data combined with TCEQ water quality data associated with Lake Aquilla shows lake concentrations for atrazine in Lake Aquilla are now meeting water quality standards. (Baumann, Dozier)

Phorid Fly Parasites. The Extension entomology group has major collaborations with USDA-ARS. Major programs with ARS include the establishment of phorid fly parasites for the control of imported fire ants. The parasites have become established approximately five miles from the original release sites and two other releases have been made in the eastern part of the state. The group is also doing joint research with ARS on cotton fleahoppers. The entomology group has one person that serves on the board of directors for the Southern Region IPM Center and has another individual that serves on the board of advisors to the same regional IPM center. The group also has two people working with ARS to release the Asian leaf beetle for control of salt cedar in the Colorado and Pecos River basins.

*Texas Rural Development Council. P*artnerships with over 20 state and local organizations and agencies resulted in the development of the highly successful Texas

Rural Leadership Development Program. This program has been implemented in over 60 counties throughout the state in a collaborative effort with the local service providers such as investor-owned utilities, cooperative utilities, USDA-Natural Resource Conservation Service-Resource Conservation and Development boards, local governments and economic development organizations resulting in more local residents becoming more knowledgeable, effective leaders in elected/appointed and unofficial capacities generating and guiding initiatives that create more economic opportunities for rural Texans.

Partnership with the Lower Colorado River Authority in the Texas Leadership Institute has provided over 500 local leaders from over 40 counties comprising their service area with enhanced training in economic development, grant acquisition and management, infrastructure development, strategic planning and service provision.

Partnership with the Texas Rural Development Council and its component organizations and agencies has resulted in conducting 10 in-depth community assessments enabling those places to better utilize resources and address deficiencies to enhance over development of the community.

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program 13, Partnerships and Collaborations.

C. Source of TCE-TAES Federal Funds
TCE: Smith-Lever and State Matching
TAES: None

D. Scope of Impact
TCE: State Specific

State TCE-TAES Plan of Work Program 14: Community Development
Key Theme: Community Development

A. Description of Activity

Stakeholder input provided by over 10,000 Texans in all 254 counties of the state through the Texas Community Futures Forum indicate that issues associated with development of their communities are pervasive and a very high priority. Specific issues include concerns about individual, community and regional economic viability and maintenance of a high quality of life.

B. Impact of Programs

Programs are basically designed to increase the capacity of targeted Texans to respond to rapidly changing socio-economic forces that affect their community economy and quality of life through increasing understanding of these forces and potential responses. Specific programs targeted at engendering and fostering home-based and micro-enterprises, support for identification and realization of entrepreneurial opportunities in agriculture, forest and other natural resource industries; development of tourism and recreational opportunities for local economic benefit; and community leadership training. Target audiences for the program consist of residents, elected and appointed officials, leaders and potential leaders, existing and potential business owner/managers in and around the over 1200 communities in all 254 counties of the state.

Coordination and cooperation with the following greatly facilitates implementation of educational programs on a state and local basis: Texas Rural Development Council, Office of Rural Community Affairs, Texas Department of Agriculture; Texas Department of Economic Development, Councils of Government, USDA-FS, RD, NRCS; Small Business Administration, Lower Colorado River Authority; Investor-owned utilities; regional universities within and without the Texas A&M University System and many more.

Significant progress has been made in providing education and information to the target audience primarily by enhancing skills, capabilities and capacities of the agency in collaboration and cooperation with others to extend and enhance benefits of the land grant university system to communities throughout the state.

Previous efforts to enhance staff capacity and capability in this critical area are showing results through increased implementation of existing programs (e.g. leadership, strategic planning) and perhaps more critically identification of areas for expanded efforts. One such is nature / eco / heritage / agri tourism and economic development. A banner program has been designated for this area with associated program support materials and training underway.

Another is the continued expansion and refinement of entrepreneurial educational support programming. Texas is providing leadership for a national pilot project in entrepreneurial agriculture and forestry with local level test programs being implemented in Texas and Colorado. In association with this project Texas is also producing an update of the nationally recognized and utilized “Building Better Rural Places” publication.

Other entrepreneurial programming support efforts include recent designation of a half million dollar grant that will, among other things provide support for distance education associated with development of small business focused on eco tourism in an East Texas Corridor. Youth entrepreneurship continues to grow in interest as results from the Texas Teens Exploring Entrepreneurial Minds (T-Teems) project continues to experience successes of its participants with several viable businesses being generated in the 3 pilot counties. Planning is underway for a statewide training focusing on this often neglected aspect of community entrepreneurship.

Participation in and acquisition of materials from regional business retention and expansion training has resulted in implementation of a pilot, showcase business retention and expansion program in one county in northeast Texas. Results will be used to expand implementation of this proven approach to community economic development. A regional pilot project of an agribusiness incubator and accelerator has significant commitments from involving 4 counties, to date, in the panhandle.

Texas Agricultural Experiment Station

The Texas Agricultural Experiment Station did not have research programs that complimented or supported TCE in its State Plan of Work Program 14, Community Development

C. Source of TCE-TAES Federal Funds

TCE: Smith-Lever and State Matching

TAES: None

D. Scope of Impact

Multi-State Extension – CO

B. STAKEHOLDER INPUT

Texas Cooperative Extension

The primary process for gaining stakeholder input within the TCE is the use of the Texas Community Futures Forum (TCFF). This process was described in detail in the CSREES State Plan of Work submitted in July 1999. As of this date, information obtained in this process is being used to guide Texas Cooperative Extension in the design and delivery of educational services and programs to address issues raised during this process.

During 2002, all counties in Texas participated in an effort to validate the results of the 1999 TCFF process. This validation effort was designed to provide local stakeholders with the progress made on issues identified by the 1999 process. In addition new issues identified since the 1999 process were able to be added to the listed of previously identified issues. Currently, TCFF 2004 is underway. As in 1999, all 254 counties are conducting a grassroots process to identify issues at the local level. In addition, a state-wide electronic survey is being implemented as an additional option for local citizens to identify issues.

In addition, any individual in Texas may access county plans and reports included in the TCE's Planning and Reporting System. These plans and reports represent work being done by Extension faculty across the state. The plans and reports are directly linked to issues raised in the Texas Community Futures Forum process and are part of most action plans developed in the 254 counties across the state. This open system allows citizens to be fully aware on the programs and services being planned by Extension.

Finally, Extension Program Councils continue to serve as a conduit to local citizens and their needs. Currently, over 11,000 individuals serve on Extension Program Councils. These volunteers represent all 254 counties in the state.

Texas Agricultural Experiment Station

The TAES Administration, Department Heads and Resident Directors variously met with industry leaders over the course of FY 2001. Groups met with included the Cactus Feeders Association, Inc., National Cotton Council, Plains Cotton Growers, Rio Grande Valley Sugar Growers, Texas Arabian Breeders' Association, Texas Beekeepers Association, Texas Cattle Feeders Association, Texas Citrus Mutual, Texas Citrus & Vegetable Association, Texas Corn Producers Board, Texas Cotton Breeders Association, Texas Cotton Ginners Association, Texas Cotton Producers Association, Texas Grain Sorghum Board, Texas Nursery & Landscape Association, Texas Paint Horse Breeders' Association, Texas Peanut Producers Board, Texas Quarter Horse Association, Texas Rice Improvement Association, Texas Rice Producers Board, Texas Rice Research Foundation, Texas Seed Trade Association, Texas Sheep & Goat Raisers Association, Texas & Southwestern Cattle Raisers Association, Texas Soybean Board, Texas Thoroughbred Association, and the Texas Wheat Producers Board among others.

TAES has encouraged the public to participate in helping TAES set priorities, assess current program and process effectiveness, and determine future directions. These processes were open, fair, and accessible to encourage individuals, groups, and organizations to have a voice, and treated all with dignity and respect. Stakeholders were initially identified by membership in listed organizations, though all events were public

and were announced in the press and other written notice. Input from these events was captured by TAES participants, and in some cases was published for further public use. Stakeholder input has always been critical to TAES processes and programs, and listed events and organizations continue as essential partners in setting the TAES agenda and recognizing and addressing emerging issues.

C. PROGRAM REVIEW PROCESS

Texas Cooperative Extension

TCE Administrative Leaders and TAES Administrative Leaders serve as merit reviewers for the Federal Plan of Work, the Federal Report of Accomplishments and Results, and associated grants and contracts. This leadership team is responsible for the oversight and management of all programs conducted by Extension and research faculty.

This process was described in the CSREES TCE State Plan of Work and the CSREES TAES State Plan of Work, both submitted July 1999. There are no significant changes in the process since that submission.

Texas Agricultural Experiment Station

Significant changes have not been made in the program review process.

D. EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

Texas Cooperative Extension

Programs in this report were identified and addressed in the Plan of Work submitted in July 1999. Issues of importance were identified in the TCE and TAES strategic plans for 2000-2004. These plans for 2000-2004 are based upon issued identified by stakeholders and citizens during the Texas Community Futures Forum held in 1999. This process is described in the Federal Plan of Work and is again discussed in this document in the stakeholder input section.

An integral part of educational programming efforts to meet the needs of the citizens of Texas includes serving under-served and under-represented populations. Various programs including those under Goal 3 and Goal 5 address these populations as a major emphasis of the programming. Examples include the Better Living For Texans program, Money 2000, partnership and collaboration efforts, and community development efforts.

Outcome and impact accomplishments are described for many of the planned programs reported on in this report. Accomplishments range from clientele gaining knowledge of specific subject matter areas to increased revenues and the saving of income. TCE outcomes for Year 2002 are expected to be built on for many of the ongoing programs in this report. These efforts, in many cases, are part of ongoing efforts to resolve issues identified in the strategic planning strategy which resulted in the issues identified in the Texas Community Futures Forum

Texas Agricultural Experiment Station

The Projects listed under Part A (Planned Programs) are evidence of the TAES participation and productivity in multi-state, multi-institutional, multi-disciplinary, and joint research-extension projects. Each program addressed the critical issues identified as

strategically important by stakeholder input. They also addressed the reporting areas addressing food security, safety and nutrition. Program progress varied among programs due to the major adjustments required to conform to the federal plan, and to adjust to levels of appropriated funding available and to grants and contracts secured by faculty. These should improve with time. The planned programs improved focus, and this should improve further as TAES moves to more fully engage all faculty who work in the program areas.

TAES scientist participated in the following multi-state, multi-institutional, multi-disciplinary, and joint research-education programs in 2003:

RRF Project No.	TITLE	States
NRSP-1	Research Planning using the Current Research Information System (CRIS) (0/03)	
NRSP-3	The National Atmospheric Deposition Program (9/08)	
NRSP-4	A National Agriculture Program to Clear Pest Control Agents for Minor Use (9/04)	
NRSP-6	Inter-Regional Potato Introduction (9/05)	
NRSP-8	National Animal Genome Research Project (NAGRP) (9/03)	AR, AZ, CA, GA, IL, IN, IA, KS, KY, LA, MD, MI, MN, NE, NYC, OK, OH, TX, UT, VA, WI
NC-107	Evolving Pathogens, Targeted Sequences, & Strategies for Control of Bovine Respiratory Disease	AL, CA, GA, IA, KS, LA, MI, MN, MS, MO, NE, OH, OK, SD, TX, WI, NADC
NC-125	Biological Control of Soil- and Residue Borne Plant Pathogens (9/04)	IA, IL, IN, KS, MI, MN, ND, NE, NJ, NY, OH, WI,
NC-136	Improvement of Thermal Processes for Foods (9/05)	CA, FL, IL, IN, IA, MI, MN, MO, NE, NJ, NYG, NYC, NC, ND, OH, OR, PA, SD, TX, WA, WI, VA
NC-168	Advanced Technologies for the Genetic Improvement of Poultry	ALX, AR, CA, DE, IL, IA, MD, MA, MI, MN, NC, OH, IN, VA, WI TX, GA
NC-202	Characterization Weed Population Variability for Improved Weed Management Decision Systems to Reduce Herbicide Use (9/05)	CO, IN, IL, IA, KS, MI, MN, MO, MT, NE, ND, OH, SD, TX, WI, WA
NC-205	Ecology & Management of European Corn Borer & Other Stalk-Boring Lepidoptera ***(9/05)***	DE, IL, IN, IA, KS, KY, MD, MI, MN, MO, NE, NYG, NC, ND, PA, TS, TX, WI

RRF Project No.	TITLE	States
NC-213	Marketing and Delivery of Quality Cereals and Oilseeds (9/03)	ID, IL, IN, IA, KS, MI, MN, MT, NE, OH, TX, WA, WI, AR, VT, VA, KY
NC-221	Financing Agriculture & Rural America: Issues of Policy, Structure and Technical Change (9/03)	AR, FL, GA, IL, IN, IA, KS, KY, MN, MI, NYC, ND, OH, SD, TX
NC-227	Ergot: A New Disease of U.S. Grain Sorghum (9/04)	KS, NE, TX
NC-503	Host Plant Control Resistance to & Best Management Practices for Karnal Bunt of Wheat (7/1/01-9/30/03)	KS, MO, MN, MN, OK, ND, TX, AR
NC-1001	Systems Analysis of the Relationships of Agriculture and Food Systems to Community Health (9/06)	IA, MN, NYC, TX, MI, MI, PA, WA, CA, NJ, OH
NC-1003	Impact Analysis & Decision Strategies for Agricultural Research (10/1/01-9/30/06) *Replaced NC-208*; *H-7084*	AZ, AL, CA, GA, IL, ID, IA, IN, MD, MI, MO, ND, NJ, NE, NYC, OH, TX, WI, VA
NC-1004	Genetic & Functional Genomic Approaches to Improve Production & Quality of Pork (9/07) *Replaced NC-210*	AL, IA, IL, IN, MI, MN, NC, NE, OH, OK, TN, TX
NC-1010	Interpreting Cattle Genomic Data: Biology, Applications Outreach (9/07) *Replaced NC-209*	CA-D, IA, IL, KY, MI, MN, OH, PA, SD, TX, VA, VT, AZ, MA
NC-1119	Management Systems to Improve the Economic & Environmental Sustainability of Dairy Enterprises (9/07) *Replaced NC-208*	CA-D, FL, GA, IA, IN, KS, KY, LA, MI, MN, NE, NH, NYG, OH, PA, SD, TX, TX, WI
NC-1167	N-3 Polyunsaturated Fatty Acids & Human Health & Diseases (9/07) *Replaced NC-167*	CO, IN, KS, , MI, MN, MO, ND, NE, NJ, TN, TX, WY
NE-60	Genetic Bases for Resistance & Immunity to Avian Diseases (9/03)	AL, AR, CA, CTS, DE, GA, IL, NH, NYC, NC, PA, SC, TX
NE-127	Biophysical Models for Poultry Production Systems (04)	CTS, IL, IA, MD, MI, MN, NE, PA, TX
NE-177	Impacts of Structural Change in the Dairy Industry (Extended to 9/03)	CTS, KY, MD, ME, MI, MN, NYC, PA, TX, UT, WI
NE-1011	Rural Communities, Rural Labor Markets & Public Policy *(Replaces NE-162)* 10/1/02-09/30/07	AR, AZ, CO, DE, GA, IA, ID, IN, KY, MI, MN, MO, NC, ND, NH, NV, NYC, OH, OR, PA, RI, SC, TX, UT, VA, WA, WI
NE-1016	Genetic Bases for Resistance and Immunity to Avian Diseases (Replaces NE-60, NE-temp361) 9/08	AR, CA, DE, IA, NC, SC, TX, NH
S-009 - -	Plant Genetic Resource Conservation and Utilization (9/03)	AL, AR, FL, GA, HI, KY, LA, MS, NC, OK, PR, SC, TN, TX, VA, GU

RRF Project No.	TITLE	States
S-065	Multistate Research Coordination, Southern Region (9/29)	AL, AR, FL, GA, KY, LA, MS, NC, OK, PR, SC, TN, TX, VA, VI
S-280	Mineralogical Controls on Colloid Dispersion and Solid-Phase Speciation of Soil Contaminants (9/02- **Ext MF 9/03)**	AL, FL, GA, KY, LA, MS, NC, OK, PR, SC, TN, TX, VA
S-287	Impacts of Trade Agreements & Economic Policies on Southern Agriculture (9/03) **[Replacing w/S_temp281]**	AL, AR, FL, GA, KY, LA, MS, NCX, ND, OK, TN, TX, WV
S-288	Nutritional Systems for Swine to Increase Reproductive Efficiency (9/03) *replaced S-145*	AL, AR, FL, GA, KY, LA, MO, NC, OK, SC, TN, TX, VA, IN
S-289	Factors Associated with Genetic & Phenotypic Variation in Poultry: Molecular to Populational (9/04)	AR, AL, SC, GA, LA, MS, NC, PA, TN, TX, VA
S-291	Systems for Controlling Air Pollutant Emissions and Indoor Environments of Poultry, Swine & Dairy Facilities (9/04) *replaces S-261*	AL, AR, FL, GA, KY, MS, NC, OK, SC, TN, TX, IL, IA, MD, NY, PA, DE
S-292	The Poultry Food System: A Farm to Table Model (9/04)	AL, AR, FL, GA, NC, SC, TX, TN
S-293	Improved Pecan Insect & Mite Pest Management Systems (9/04)	AL, AZ, GA, KS, LA, NM, OK, TX
S-297	Soil Microbial Taxonomic & Function Diversity as Affected by Land Use & Management (10/1/00-9/30/05)	AL, AR, DE, FL, GA, MD, NE, NC, PR, SC, TN, TX, WV, WI, IN, CO
S-299	Enhancing Production & Reproductive Performance of Heat-Stressed Dairy Cattle (9/05) ***Approved CRIS 3/19/02***	AL, FL, GA, LA, MS, MO, NC, TN, VI, AR, SC, TX
S-300	Mosquito & Agricultural Pest Management in Riceland Ecosystems (10/1/00-9/30/05)	AR, CA, FL, IL, LA, TX
S-301	Development, Evaluation & Safety of Entomopathogens for Control of Arthropod Pests (10/1/00-9/30/05)	AL, AR, AZ, CA, CTH, FL, GA, ID, IL, KY, LA, ME, MN, NJ, NYC, NC, OH, SC, TN, TX, VA
S-302	Biological Control of Soilborne Plant Pathogens for Sustainable Agriculture (10/01/00-9/30/05)	AL, AR, FL, GA, IN, KY, LA, MS, NC, OK, SC, TN, TX
S-303	Biological Control of Arthropod Pests & Weeds	AL, AR, FL, GA, KY, LA, NC, OK, SC, TN, TX, VA
S-304	Development of Genetic Resources for Cotton (9/05)	AL, LA, MS, NM, NC, OK, TX, AR, AZ, CA-D, GA, ALX

RRF Project No.	TITLE	States
S-1000	Animal Manure & Waste Utilization, Treatment & Nuisance Avoidance for a Sustainable Agriculture (9/06)	AL, AR, CA, FL, GA, HI, IL, IN, IA, KY, LA, MI, MN, MS, NC, OH, PA, SC, TN, TX, VA, WI
S-1004	Development & Evaluation of TMDL Planning & Assessment Tools & Processes (9/06)	AL, SC, IA, LA, NC, OK, PA, IN, AR, FL, GA, IL, MN, TN, WV, VA, MI, TX, AR
S-1007	The Science & Engineering for a Biobased Industry & Economy (10/01/02-09/30/07)	AR, AZ, CA-D, FL, HI, IA, IL, IN, KS, KY, LA, MI, MN, MS, MT, NC, ND, NE, OK, PA, SC, SD, TN, TX, UT, VA, WA, WI, WV
S-1010	Dynamic Soybean Pest Management for Evolving Agricultural Technologies & Cropping Systems (10/02-9/07)	AR, GA, IA, IL, IN, KS, KY, LA, MI, MN, MS, ND, NE, OH, TN, TX, VA, WI
W-82	Reducing the Potential for Environmental Contamination by Pesticides & Other Organic Chemicals (9/05)	AL, AZ, CA, CTH, CO, DE, FL, HI, IN, IL, IA, LA, KS, MN, MT, PA, SC, TX, WA
W-102	Integrated Methods of Parasite Control for Improved Livestock Production (9/04)	CA, GA, IL, KS, LA, MN, MO, MS, MT, UT, TX, VA, WA
W-112	Reproductive Performance in Domestic Ruminants ***(O6)***	AK, AZ, CA, CO, HI, ID, KS, MI, MN, MO, MT, NV, MN, OH, OR, TX, WA, WY NE
W-128	Micro-Irrigation: Management Practices to Sustain Water Quality & Agricultural Productivity (04)	ZA, CA, FL, GU, HI, ID, IA, KS, MN, NM, TX, VA, WA, WY
W-170	Chemistry & Bioavailability of Waste Constituents in Soils (04)	AZ, CO, CA, FL, GU, HI, IN, IA, KS, OK, MI, OR, PA, TX, VA, WA, WY
W-171	Germ Cell & Embryo Development & Manipulation for the Improvement of Livestock (9/04)	AR, CA, CO, CT, IA, IL, LA, OK, OR, TX, UT, WA WI
W-173	Effects of Stress Factors on Performance of Farm Animals (9/06)	AZ, AL, CA, FL, HI, IL, KS, KY, MS, MO, TN, NYC, TX, CO
W-189	Natural Products Chemistry as a Resource for Biorational Methods of Insect Control (revised 9/04)	AZ, AR, CA, CO, FL, MN, MT, NV, FL
W-190	Agricultural Water Management Technologies, Institutions and Policies Affecting Economic Viability and Environmental Quality (9/04)	AZ, CA, CO, HI, ID, NE, NV, ND, OR, TX, WA, KS, UT, NM

RRF Project No.	TITLE	States
W-195	Water Quality Issues in Poultry Production & Processing (9/05)	AL, AR, CA, DE, GA, KS, LA, MD, MI, MN, MS, NC, OR, 0PA, TN, TX, UT, VA, WV
W-1133	Benefits & Costs of Natural Resources Policies Affecting Public & Private Land (9/07)	CA, CO, GA, IA, KY, MA, ME, MI, ND, NH, NV, NTC, OH, OR, PA, UT, WA ,WV, WY, TX
W-1177	Enhancing the Competitiveness of U.S. Meats (9/07)	CA-D, CO, IA, NE, VA, SD, TX, UT, VA, WA, WY

E. MULTI STATE EXTENSION AND RESEARCH ACTIVITIES
See Attached - CSREES-REPT (2/00) for Multi-State Extension Activities

F. INTEGRATED ACTIVITIES
See Attached - CSREES-REPT (2/00) for Integrated Extension Activities.
See Attached - CSREES-REPT (2/00) for Integrated Research Activities.

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