

Texas Cooperative Extension
and
Texas Agricultural Experiment Station

**Joint Annual Report of
Accomplishments and Results:
FY 2004**

**Texas A&M University System
Agriculture Program**

**For Federal Reporting Year
2004**

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

FY 2004 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 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 is 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 risk management. Specific risk management related programs to be highlighted include the TCE-TAES jointly developed *FARM Assistance* decision support system, the *Agricultural and Food Policy Center (AFPC)* analyses of financial health for representative farms, the *Center for North American Studies (CNAS)* efforts to evaluate trade policy scenarios and their economic impacts on various sectors of the agricultural economy, and financial recordkeeping tools and management information systems targeted to improve risk management decisions for beef cattle producers through the *Standardized Performance Analysis (SPA)* program.

Field Crop 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. Research conducted by the Texas Agricultural Experiment Station along with outreach education programs through Texas Cooperative Extension had significant impacts on the production and economic success of growers in Texas in 2004. Through local, regional and statewide programs, Texas producers are the recipients of timely, sound and objective research-based information to enhance their production success.

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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
		<u>FY 2004</u>
Program 1 – Risk Management		1,500
	FTEs	18.88
Program 2 – Field Crops & Forage Production		2,481
	FTEs	111.28
Program 3 – Livestock Quality & Profitability		3,161
	FTEs	143.44
Total Allocated Resources Goal 1		7,885
	FTEs	356.55

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

Source of Funding and FTEs

Federal Funds (\$ x 1000):	3,969
State Funds (\$ x 1000):	13,345
FTEs:	99.92
Number of Projects:	318
Number of Publications:	1,296

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 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 is 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. 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 FY04. Attendance included producers from three states. These individuals greatly enhanced their risk management knowledge and skills. Many of these Master Marketer graduates then became marketing club leaders in their respective counties thereby teaching others about risk management tools. A new, in-depth training program for new and emerging producers was launched in FY03—referred to as Tomorrow's Top Ag Producer Program. Over 100 contact hours with each participant occurred through the 15-month curriculum ending in January of 2004. 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 or geographic regions.

The *Agricultural and Food Policy Center (AFPC)*. The farm program is an integral part of the risk management decisions producers must make. AFPC conducted analyses for Congressional leadership and communicated results to state and national commodity groups relative to the economic health of representative farms under various policy scenarios. The AFPC also analyzed alternative approaches to support ethanol production.

The *Center for North American Studies (CNAS)* (a joint TAES-TCE activity) evaluates trade policy scenarios and their economic impacts on various sectors of the agricultural

economy. CNAS has taken the lead with other in-state groups relative to trade with Cuba and analyzing potential economic benefits to the U.S. farm sector. The WTO decision related to cotton is another issue receiving CNAS attention in FY04.

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 coordinated Excel spreadsheets. The SPA database also is used for applied research and the development of improved education programs for beef producers. *The Tomorrow's Top Ag Producer Program* is another example of intensive education with one-to-one follow-up to increase the adoption of information technology.

The emphasis in risk management by TCE-TAES is targeted toward owners and operators of commercial size farms and ranches. Some of these commercial operations are geographically disadvantaged in that they are located in isolated areas. 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 (managed for the Southern Region by TCE), 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, the Texas and Southwest Cattle Raisers Association, the Texas Department of Agriculture, 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 1996-2002 Master Marketer workshops, 599 producers estimated, on average, that their *annual* incomes had improved by \$31,721 as a result of adopting effective marketing and risk management practices. If the 106 producers who have participated in the four in-depth workshops since mid-2002 received similar results, then the aggregate *annual* impact of this part of the program in Texas would approach \$22 million in added combined income to these 705 producers!

The training appeared to have a major impact on the participants' risk management practices. For example, prior to the in-depth training, 36 percent of 705 producer-graduates from the 1996-2005 workshops said they had marketing plans. Two and a half years later, 85 percent

said they had developed marketing plans. Prior to the workshops, 44 percent said they used breakeven costs in marketing decisions. Two and a half years later, 80 percent indicated they incorporated breakeven price information into their enterprise marketing plans. Similar improvements were reported for other knowledge and skill variables. Producers indicated a 91 percent increase in improved confidence towards utilizing various marketing tools for risk management from participating in Master Marketer.

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. Members of current clubs were surveyed 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.

A new publication on risk management was 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.

Tomorrow's Top Agricultural Producer (TTAP): Tomorrow's Top Agricultural Producer Program was launched in FY03 to reach the risk 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 occurred with participants in this intensive program that focused 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 being utilized in Phase II of the intensive program where each program participant was assigned three mentors. A formal evaluation of the program is planned for FY05 after the mentor program has been completed. The program was so successful in terms of improved knowledge and skills, plans are underway to start a new class in FY05.

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 1.9 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 \$25,492 per year difference in net worth was calculated for this measure. 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. The FARM Assistance program has been recognized for use in FSA borrower training programs. When producers complete the planning requirements associated with their FARM Assistance analysis, this satisfies the borrower training requirements for FSA borrowers.

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. 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 are an integral part of risk management. Analyses of the safety net impacts of the 2002 farm bill on representative crop farms was analyzed for the House Ag Committee. AFPC developed two baseline analyses and presented them to the House and Senate Ag Committees, USDA policy analysts, and commodity groups. The Center also conducted a study on the economics of ethanol production in Texas as a diversification alternative for grain producers.

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; and (3) the economic impacts of renewed agricultural exports to Cuba. 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. 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.

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) and Beef PEP Program: 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. An application of the SPA program was to evaluate the value of the adoption of technology in beef cattle through the Beef PEP program. Demonstration herds that adopted best management practices were shown to increase average net returns by \$52.96 per exposed cow. Statistical analysis indicated that 61 percent of this increase could be attributed to the Beef PEP program. Conservatively, if five percent of the cattle in Texas are in herds that adopt the best management practices in Beef PEP, the impact on the economy would be \$3.8 million.

Trade Adjustment Assistance. During 2004, TCE was involved in the multi-disciplinary development of educational materials and publications, and in the associated training of over 2000 participants from the Texas shrimp fishing industry who had applied under the expanded Trade Adjustment Assistance Program. Educational programs were presented in three languages—english, Spanish, and Vietnamese. In most cases, these underserved audiences had never contacted CSREES partners for assistance. These Texas shrimp fishermen were able to apply for and receive over \$4.5 million in financial assistance. This educational effort has received two awards already.

Output Indicators:

No. of people completing non-formal risk management education programs—24,594

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—4,140

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—2,413

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, NY

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 Crop and Forage 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 2004. 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 eastern regions of Texas engaged in the Texas Boll Weevil Eradication Program (~ 900,000 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 these 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. The publication was revised in early 2004 to reflect most recent research showing how standing stalks could best be controlled. Over 2,500 clientele were contacted via educational programs, and over 3,000 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

continue to be lauded by the Texas Cotton Producers Association and the Texas Boll Weevil Eradication Foundation.

The High Plains of Texas is, by any measure, a harsh environment for cotton production, with risk from short growing seasons, drought and high temperatures causing cotton producers to have a very real uncertainty with respect to profits. In addition to the demanding climate, the continuing loss of the domestic cotton mills is causing High Plains producers to struggle to make cotton production profitable. There is a great variability in the genetics of cotton varieties with respect to adaptation to these adverse conditions. A recent increase in the release of cotton varieties and genetically altered traits makes selection of cotton varieties by farmers a more difficult decision. Substantial gains in both yield and quality are required for sustainable cotton production. Recognizing this scenario, TCE specialists teamed with the Plains Cotton Growers and Cotton Incorporated to identify more profitable new transgenic and conventional varieties for High Plains producers through large-plot variety testing. Based on producer feedback to surveys obtained at High Plains crop conferences in 2004, it appears that the large-plot systems variety project is very useful to South Plains cotton farmers. According to the USDA Cotton Varieties Planted reports for 2001, 2002, 2003, and 2004 significant variety changes in the High Plains can be documented. These changes parallel improved yields and cotton quality identified in large-plot cotton variety studies initiated by TCE specialists and their collaborators. Varieties and technologies with lower overall economic returns are quickly being replaced by improved types. One example is the rapid adoption of the FiberMax 958, a conventional variety, which has been identified by the Systems Variety Testing Project as a more profitable type. The 2003 total for planted acres of FiberMax 958 from the two classing offices (Lubbock and Lamesa) is about 586,000. Producer responses to surveys of the economic impact on large-scale variety trials varied from \$35/acre to \$160/acre. If we use an average of \$50/acre in increased profits on South Plains cotton acres, this would translate to a \$29.3 million increased returns to the region with the adoption of just this one variety. We are obtaining additional gin-specific data from several producers across the region to better identify the value of the project. It is expected that continuing increases in "new variety" acreage will have a major impact on both profitability and quality/marketability of High Plains cotton over the next few years.

During the 1950s to the late 1970s, cotton production was a part of the cropping system for producers in the Comal, Guadalupe, Caldwell, Hayes, Wilson, and Gonzales county area in central Texas. Production costs associated with control of the boll weevil, bollworms, and weeds, coupled with production risks associated with the climate reduced the economic viability of cotton in Central Texas. For almost 20 years, little cotton was grown in this region of the state. The advent of new transgenic varieties to reduce insect damage and allow efficient weed control, coupled with and proven reduced tillage systems caused TCE specialists and agents to reconsider the feasibility of cotton as a viable profitable crop for the region. Educational meetings were developed to educate local producers on the feasibility of cotton to enhance existing grain crop production systems.

Planted cotton acreage for this cluster of Central Texas counties was 2351 acres in 2003, following a long decline due to low yields, high costs attributable to pest management and stress related production problems. The low planted acreage was threatening economic viability of the last cotton gin in the region. TCE specialists and County Agents identified the problem and created a program to increase income to local farmers, while providing more sustainable income to keep the gin and the Central Texas cotton industry viable. In 2004, following a series of demonstrations and educational programs, the acreage increased 47.5% (2124 acres) in the

region for a total of 4475, compared to a statewide planted acreage increase of only 4.5%. With that increase in acreage, a cotton gin in Lockhart will be able to remain open and to continue to offer producers the option of different cropping systems to spread their risk. Current production systems primarily involve corn, sorghum and wheat.

Corn was previously the most profitable crop in the region. In large-scale field trials at the Luling Foundation trials this year, corn had its best production year in recent history, resulting in a gross profit of \$ 121.89 per acre. At the same location, cotton, using transgenic varieties and reduced tillage systems, produced a gross profit of \$ 195.89, or \$74.00 per acre over corn. As these large acreage trials are fairly representative production within the region, an extrapolation of these results would reflect an increased farm income of \$157,000 in six counties due to one Extension program. This does not include the increased revenue other industries associated with cotton production such as suppliers, ginner and harvesters.

Texas crop 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 practices. 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 but 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, giving farmers more net profit with significantly decreased soil erosion losses.

The shortage of moisture during crop production remains the one variable which most limits yield and sustainable crop production. Water availability in the state has been identified by many sources as the number one concern of public officials and citizens alike. It is documented that conservation tillage systems typically conserve between 1- and 2 inches more stored soil moisture when compared to crops produced conventional tillage systems. The educational programs of Texas Cooperative Extension and partner agencies has resulted in a significant trend towards the adoption of high residue crop production with reduced tillage practices. In addition to reducing fuel, equipment and labor usage in crop production, reduced tillage practices on 3.9 million acres of cropland are estimated to conserve 6 million acre inches of water from precipitation and irrigation, as well as reducing soil erosion and stream sedimentation by significant amounts.

The Texas IPM program continues to conduct outstanding work that has a major impact on Texas crop production. The program averages 300 applied research projects, 12,000 farm visits, 250 county meetings and 140 crop tours and field days annually. The program also leverages state funding by averaging \$500,000 annually in extramural funding. With the reduction in entomology programs at major universities and the emphasis on basic research, college students have limited opportunities to participate at the field level. An internship program addresses the lack of field experience and exposes high school and college students to Extension. The program has provided internships for 43 students from 1998-2004. An evaluation of the program was conducted in 2004 to measure the impact of the program. The survey asked the interns a series of questions that rated the value of the program on a 1 to 5 scale (1=very valuable and 5=no value). The interns rated the program very high averaging a 1.5 rating for all the questions. Interns indicated that the program helped to clarify educational goals

and made their current college courses relevant. The program also taught the interns new skills and techniques and helped to decide their future careers.

Student comments about the IPM program included; “Although I am no longer in the Ag field, it was a great learning experience that taught me things that I can use everyday regardless of my career” and “the only improvement would be to let more people know about this great opportunity. This is an experience that every agriculture student should have.”

Grain storage and exports are major business for the Lower Coastal Bend. A multi-disciplinary approach including entomologists, agronomists, economists and agricultural engineers has been conducted. The region conducts the Gulf Coast Grain Handlers Conference annually draws 130 participants per year and receives excellent evaluations. This is one of two conferences in Texas that gives participants Integrated Pest Management (IPM) information for this commodity and hands-on training. In conjunction with this conference, a major applied research project is being conducted with looking at new technology for stored corn and grain sorghum. Currently, stored grain pests are primarily controlled with fumigants. Fumigants are effective but application restrictions and potential health hazards have the industry looking at alternatives. The study has looked at eight treatments in grain sorghum and four treatments in corn. The study has found promising treatments especially for grain that will be stored for more than six months.

More than 70 per cent of the 157 millions acres of Texas agricultural lands are classified as rangeland and permanent pastures. These lands produce the forages that sustain the Texas grazing livestock industry. The value of forages is largely measured through the value of the livestock that consume them. Forages supply about 70 per cent of the lifetime nutrients consumed by Texas livestock. The most recent cash receipts for all forage-consuming livestock in Texas were about \$7 billion, with nearly \$6 billion attributed to beef cattle. An educational program has been designed to reduce winter feeding costs of beef cattle and other livestock by establishing forage management systems which create year round pasture by the incorporation of annual legumes and ryegrass into management systems and through the use of stockpiled hay. This program has been very successful as indicated by the increased interest reported by County Agents from their producers in east, central and south Texas. The potential cash savings per cow per winter are enormous. The average savings for cow-calf operators 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 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. The demand for this short course has resulted in a waiting list for interested participants.

Over one million tons of silage is required to sustain the feedlot industry within the Southern High Plains region, and the demand for silage continues to grow annually as dairies move into the region. Production of this corn silage requires approximately one million acre-inches of irrigation water. In joint TCE-TAES cattle feeding trials, the new brown mid-rib forage sorghums were determined to have 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 irrigation 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 four years of research and educational efforts have made a significant impact on water usage and costs associated with silage production. Several feed yard 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 dramatic 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 has been crucial to the

recommended de-listing of these water bodies by TCEQ and the Texas State Soil and Water Conservation Board (TSSWCB) 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 60% below the 1997-98 annual running average concentration of 0.004 mg/L for atrazine (reason for listing Lake Aquilla on 1998 303(d) list) Lake Aquilla is now meeting water quality standards for atrazine for the public drinking water designated use. Given this information, TCEQ and TSSWCB have recommended Lake Aquilla be removed from the 2004 303(d) list for atrazine.

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 2004, it was estimated that 80% of the state's 290,000 acre soybean acreage was transgenic, 56% of the state's 5.85 million acre cotton crop and 35% of the state's 1.83 million acre corn crop were transgenic. To accomplish this rapid large scale transition to genetically enhanced varieties, Extension faculty initiated approximately 300 weed management trials in 2004, 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. These transgenic crops have also 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 aphid. 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 January of 2004.

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 A&M ryegrass-breeding program continues to have a significant impact on the livestock industry in Texas and in Oregon. Several million pounds of the variety 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 OI01 and Tamrun OL02 is having a huge impact on the Texas peanut industry. In 2003, yields of Tamrun OI01 approaching 5,000 lbs/ac were recorded in south Texas. The success of this variety is directly responsible for the 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, Israeli, 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, both enhanced value and 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 four hundred (3,400) 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. Eighty percent (80%) 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 two hundred (2,200) producers from 14 states have evaluated 22,000 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 22,000 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 23, 600 beef cattle producers since 1990, averaging over 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 88% excellent, 12% 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 11,000 horses since 1997. The Extension Horse Theft Prevention Workshop alone has reached over 43,000 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 3,360.

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 3,500.

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 immuno-compromised 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. *Food Safety: It's Our Business* was targeted towards managers of food service establishments. *Healthy Harvest*, a program that focuses specifically on fruit and vegetable safety, was implemented at the consumer level. 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 2004. 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
	<u>FY 2004</u>
Program 4 – Food Protection Management	710
FTEs	31.39
Allocated Resources Goal 2	1,084
FTEs	49.00

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

Source of Funding and FTEs

Federal Funds (\$ x 1000): 358

State Funds (\$ x 1000): 414

FTEs: 6.61

Number of Projects: 43

Number of Publications: 111

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 (CDC) estimate that foodborne diseases cause approximately 76 million illnesses, 325,000 hospitalizations and 5,000 deaths each year. Populations most vulnerable to foodborne disease include pregnant women, the elderly, the very young, and those individuals with weakened immune systems.

These foodborne diseases are linked to various bacterial, viral, and parasitic pathogens. According to information from the Centers for Disease Control and Prevention, over two hundred and fifty different types of foodborne diseases have been described. Common symptoms of foodborne disease include nausea, vomiting, diarrhea, abdominal cramping, fever, and headache. These symptoms are dependent on the microbe ingested.

In the year 2000, the United States Department of Agriculture Economic Research Service estimated that the medical, productivity loss, and premature death costs related to five foodborne pathogens totaled \$6.9 billion dollars annually. The specific foodborne pathogens used in this estimation included *Campylobacter*, *Salmonella*, *E. coli* O157, *E. coli* non-O157 STEC, and *Listeria monocytogenes*. Foodborne disease is a costly problem.

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 State Health Services, local public health jurisdictions and trade organizations such as restaurant and convenience store associations.

B. Impact of Program

Output Indicators:

During the 2003-2004 year, more than 2100 food managers participated in *Food Safety: It's Our Business* trainings through local Texas Cooperative Extension offices. Other efforts in this area have centered on providing food safety and food protection management to other audiences. Results of several efforts are provided below.

A Healthy Harvest: Safe Handling of Fresh Fruits and Vegetables

Background.

Although not traditionally associated with foodborne disease, fresh fruits and vegetables have recently been linked to several outbreaks. Specific examples include Hepatitis A contamination on green onions and *Salmonella* contamination on tomatoes. Overall, the number of outbreaks associated with fresh produce items has increased in recent years.

To promote health, nutrition experts recommend fruits and vegetables as a part of a balanced diet. From a food safety standpoint, consumption of fresh produce poses a unique risk. Specifically, when fruits and vegetables are consumed raw, there is no kill step in which pathogens are eliminated. Rather, pathogen load is most often reduced by washing the produce under clean, running water. Therefore, the risk of foodborne disease from residual pathogens following washing persists. Consumption of fresh produce may be especially risky for those prone to foodborne disease (i.e. those with weakened immune systems).

In 2000, the Food and Drug Administration prepared guidelines for consumers regarding fresh produce safety. These guidelines and other research based information formed the basis for the development of an educational program aimed to help consumers reduce their risk of foodborne disease from fresh fruits and vegetables. The program was created by Texas Cooperative Extension as part of a multi-state USDA-CSREES-IFAFS funded grant aimed to improve the overall safety of fruits and vegetables (grant number 00-52102-9637).

To teach consumers about safe handling of fresh produce, a one hour educational program entitled "A Healthy Harvest: Safe Handling of Fresh Fruits and Vegetables" was developed. The program involved hands-on activities and focused on four concepts relating to fresh produce safety: selecting and purchasing produce, proper storage, proper methods to wash fresh fruits and vegetables, and safe methods to serve them. The target audience for the program was consumers responsible for food preparation in their home. The specific goals of the program included the following:

- To increase awareness among consumers about the risks of foodborne disease
- To promote safe handling of fresh fruits and vegetables at the grocery store or market
- To promote safe storage of fresh fruits and vegetables at home
- To promote adequate washing of fresh fruits and vegetables
- To promote safe handling when serving fresh fruits and vegetables

The program was delivered to consumer audiences by Family and Consumer Sciences Extension Agents. Agents presented the program to participants at forums such as local Farmer's Markets and grocery stores. Other programs were delivered to captive consumer audiences in their counties. An educational game and tri-fold display for the project were also created to strengthen programming efforts. Additionally, the program was used as a train-the-trainer tool to teach paraprofessional nutrition education staff about this food safety topic.

To evaluate the program, retrospective pre-tests and post-tests were given to participants to assess knowledge, attitudes, and behaviors related to fresh produce safety. Additionally, a follow-up telephone survey was conducted among a random sample of project participants to assess long-term impact of the program.

In addition to the one-hour educational program, a series of consumer publications about fresh produce safety were written and peer-reviewed. These fact sheets were translated into Spanish and placed on the project website at: <http://fruitandvegetablesafety.tamu.edu>. This website served as another resource for consumers searching for information on this food safety topic. Specific fact sheets included on the website were:

- Safe Handling of Fresh Fruits and Vegetables
- Selecting Fresh Fruits and Vegetables
- Safe Storage of Fresh Fruits and Vegetables
- Washing Fresh Fruits and Vegetables

The following fact sheets relating to specific produce items were also developed and peer reviewed. These produce items were chosen as they were the specific fruits and vegetables involved in the research component of the project.

- Safe Handling of Fresh Cantaloupe
- Safe Handling of Fresh Oranges
- Safe Handling of Fresh Parsley
- Safe Handling of Fresh Strawberries
- Safe Handling of Fresh Tomatoes

The program script, handouts, visuals, new releases, educational game and tri-fold display were also available for download on the project website.

This educational program was implemented in 69 Texas counties beginning in February through August of 2004. Most of the participants were female (89.5%) and Caucasian (60.5%) Participants were also older, with 29.0% between the ages of 45 and 64 and 44.5% over the age of 65 (Tables 1 and 2). One-half (50.1%) of participants reported that they completed some college, completed college, or had obtained a graduate degree. Annual household income level varied for participants, with 19.9% reporting an income less than \$15,000, 34% reporting an income between \$15,000 and \$49,999, and 15.5% reporting a household income greater than \$50,000 annually.

Table 1 Ethnicity of Participants by Percentage n = 2651

% African American	10.5
% American Indian	1.3
% Asian American	1.3
% Caucasian	60.5
% Hispanic American	23.4
% Other	3.0

Table 2 Age Range of Participants by Percentage n = 2651

% Under 24 years of age	6.0
% 25 -34 year of age	10.6
% 35-44 years of age	9.9
% 45-54 years of age	11.6
% 55-64 years of age	17.4
% over age 65	44.5

Output Indicators:

Number of counties involved in program: 69

Number of program participants: 2,651

Number of successful requests for pages to website in 2004: 36,098

Number of fact sheets downloaded from website during 2004: 12,673

Following the program, 70.1% of participants strongly agreed that the program was helpful to them while 76.9% of participants strongly agreed that the program will help them keep fresh fruits and vegetables safe to eat.

Outcome Indicators:

The extent to which the outcome indicators were met was based on retrospective pre-tests, post-tests, and data from a follow-up telephone interview to assess long-term impact of the program. A random sample of 421 participants participated in the telephone survey.

Outcome Indicator #1: Consumers will be more aware of the risks of foodborne disease.

Comparison of data from retrospective pre-tests and the long-term telephone surveys suggest that program participants slightly improved their attitude about the risks associated with foodborne disease, especially the risks related to fresh fruits and vegetables following the program (Table 3). However, no significant improvements were made.

Table 3 Comparison of Data for Attitude Statements¹ – Outcome Indicator 1

Attitude Statement	Pre-test	Long-term post-test ²	% Change
I believe foodborne illness caused by bacteria on food is a problem	86%	93%	+7%
I believe foodborne illness caused by bacteria of fresh fruits and vegetables could be a problem.	85%	96%	+11%
I believe foodborne illness can occur if fresh fruits and vegetables are handled unsafely.	90%	97%	+7%

¹Percentages shown are for participants answering strongly agree or agree to the statement

²Long-term post-test refers to data from the follow-up telephone survey

Outcome Indicator #2: Participants will handle fresh fruits and vegetables safely at the grocery store or market.

Comparison of data from retrospective pre-tests and the long-term telephone surveys suggest that program participants improved their attitude regarding handling of fresh produce at the grocery store or market. Specifically, a significant ($p < .05$) +15% change was noted for the statement “How fruits and vegetables are handled while grocery shopping is important to keep them safe to eat” (data for strongly agree and agree responses). Significance was assessed using paired sample t-tests. Greater improvement was noted among one participant behavior for this outcome indicator (Table 4). Following the telephone survey, 67% of participants always separated fresh fruits and vegetables from raw meat when they placed them on the check-out counter, while 80% always bagged their fresh produce separately from raw meat.

Table 4 Comparison of Data for Behavior Statement¹ – Outcome Indicator 2

Behavior Statement	Pre-test	Long-term post-test ²	% Change
*Separate fresh fruits and vegetables from raw meat in the shopping cart.	49%	77%	+28%

¹Percentages shown are for participants answering always to the statement

²Long-term post-test refers to data from the follow-up telephone survey

* Significant difference found between pre- and long-term post data using paired sample t-tests ($p < .05$)

Outcome Indicator #3: Participants will store fresh fruits and vegetables safely.

Data from retrospective pre-tests and the telephone survey suggest that consumers improved their attitude toward storage of fresh produce. Data show a significant ($p < .05$) +7% change for the statement “Proper storage of fruits and vegetable can keep them safe to eat” using

strongly agree and agree responses. Behaviors related to storing fresh produce also improved (Table 5).

Table 5 Comparison of Data for Behavior Statement¹ – Outcome Indicator 3

Behavior Statement	Pre-test	Long-term post-test ²	% Change
*Keep fruits and vegetables separate from raw meat in the refrigerator.	72%	95%	+23%
*Use a thermometer to check refrigerator temperatures.	27%	55%	+28%

¹Percentages shown are for participants answering always to the statement

²Long-term post-test refers to data from the follow-up telephone survey

* Significant difference found between pre- and long-term post data using paired sample t-tests (p<.05)

Outcome Indicator #4: Participants will wash fruits and vegetables adequately.

Participant attitudes relating to washing fresh produce improved between pre-test and long-term post-test data. A significant +8% change was noted for consumers responding strongly agree or agree to the attitude statement “Washing whole fruits and vegetables can help keep them safe to eat”. Improvements were also noted among behaviors relating to washing fresh produce (Table 6).

Table 6 Comparison of Data for Behavior Statement¹ – Outcome Indicator 4

Behavior Statement	Pre-test	Long-term post-test ²	% Change
*Wash fresh fruits and vegetables even if the skin or rind is not eaten.	41%	71%	+30%
Use a fruit/vegetable brush to scrub skins and rinds of firm fruits and vegetables.	30%	40%	+10%
*Wash fresh fruits and vegetables just before eating or cooking them.	61%	85%	+24%

¹Percentages shown are for participants answering always to the statement

²Long-term post-test refers to data from the follow-up telephone survey

* Significant difference found between pre- and long-term post data using paired sample t-tests (p<.05)

Outcome Indicator #5: Participants will safely handle fresh fruits and vegetables when serving them.

Participants’ attitudes regarding safe handling of produce when serving it improved slightly. A +6% change was noted between pre- and long-term post-test data for strongly agree and agree responses for the statement “I can reduce the risk of foodborne illness by washing and

sanitizing areas where foods are prepared”. Significant improvements were noted for behaviors relating to this concept (Table 7).

Table 7 Comparison of Data for Behavior Statement¹ – Outcome Indicator 5

Behavior Statement	Pre-test	Long-term post-test ²	% Change
*Refrigerate fresh fruits and vegetables that have been cut within two hours.	44%	73%	+29%
*Wash and sanitize food preparation areas in the kitchen.	56%	75%	+19%
*Wash hands before handling fresh fruits and vegetables.	58%	84%	+26%
*Wash and sanitize cutting boards/utensils before preparing fresh fruits and vegetables.	57%	81%	+24%

¹Percentages shown are for participants answering always to the statement

²Long-term post-test refers to data from the follow-up telephone survey

* Significant difference found between pre- and long-term post data using paired sample t-tests (p<.05)

Impact of the Program

Participants in this program reported slight improvements in attitudes about various fruit and vegetable safety issues. More importantly however, were the significant improvements in behaviors related to keeping fresh produce safe to eat. These improvements in behavior were still present following the long-term evaluation. Therefore, these data suggest that this program was effective in teaching consumer audiences skills that will improve the safety of the foods they eat.

Institute of Food Science and Engineering

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 engineering agency, agricultural agency, and 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 TAMUS 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 7 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, Southeast Asia Food Science and Technology Center, 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, Entomology, 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 State Health Services.

Among the external council members are leaders from the following organizations: Sun Orchard, Inc., Wal-Mart, Inc., Frito Lay, Inc., Genecor, 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., Lynntech Inc., Praxair food Technologies, Warnex Corp., H.E.B. Grocery Company, Kellogg's, Research Valley Partnership, National Starch & Chemical and Silliker 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.
Food purchase behavior change, a result of Texas School Food Service Training by Texas Cooperative Extension -- OUTCOME, 78 TEXAS SCHOOLS ORDER IRRADIATED GROUND BEEF

Public schools like other food service providers experience the challenges brought by food borne pathogens such as E. coli O157:H7. Some 62,458 Americans fall prey to this pathogen in food annually, causing hundreds to experience acute kidney failure, a life-long threat. USDA-FSIS risk analysis estimates that 10 E. coli induced acute kidney failures per year are fatal. A recent case involving 11 school children resulted in a \$4.5 million award to the families and children from the Findley Washington school.

September 2004 marked a significant food safety choice, "a behavior change," among Texas public school Food Service Directors who place orders for USDA School Lunch Program foods each fall and spring for Texas 1500+ school districts. USDA's inaugural offering of irradiated ground beef resulted in 78 Texas schools ordering irradiated ground beef for fall 2004 delivery. NOTE: USDA cancelled all orders due to lack of competitive bids. Only one U.S. meat processor submitted a bid for the inaugural offering).

In preparation for the USDA launch of irradiated ground beef Texas Cooperative Extension (Vestal & Thompson) hosted some 300 School Food Service directors in a series of training opportunities in Irving, Dallas, San Antonio, El Paso, College Station, Austin and Waco from June 2003 to August 2004. In addition, 30 county Extension Agents, 28 Family and Consumer Science Teachers and 23 food industry professionals attended training events on campus at the Institute of Food Science and Engineering on Campus.

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, USDA-CSREES-IFAFS Grant # 00-52102-9637

D. Scope of Impact

Multi-State Extension - Multi-State projects include working with Colorado, Ohio and Washington to develop program indicators and working with South Carolina, North Carolina, Florida, Georgia and California to prioritize and diffuse post harvest fruit and vegetable safety technologies.

Collaboration with USDA-FAS, USDA-APHIS and California Farm Bureau Federation in a “Framework of Equivalency” discussion and symposium on phytosanitary uses of irradiation for produce.

Collaboration with the International Atomic Energy Agency- to provide technical training on phytosanitary and sanitary uses of food irradiation technology.

Multi-national Research and Development – Southeast Asia Food Science and Technology Center Project with Indonesia.

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 Passenger Safety Project, the Cancer Risk Reduction for Rural Texans Project, and efforts of the Vegetable and Fruit Improvement Center. These programs, with the exception of the Passenger Safety Project, are designed 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 chronic diseases is extremely significant since 70% of deaths and 75% of health care costs in the U.S. are due to chronic diseases. The Passenger Safety project is designed to provide a safe environment for children and adults using our roadways.

Walk Across Texas. According to the Task Force on Preventive Health Services, 29% of American adults are not physically active at all, and 50% are not active enough to achieve health benefits. Only 27% of students in grades 9 to 12 engage in the recommended amounts of moderate-intensity physical activity. Daily participation in high school physical education classes dropped from 42% in 1991 to 32% in 2001. Adequate physical activity lowers risk and improves management and outcomes for leading causes of death including heart disease, hypertension, stroke, and diabetes. Walk Across Texas is a physical activity program aimed at helping participants establish the habit of physical activity with support from their peers. County Extension agents in 60 counties across Texas organized teams of eight people and school classes to keep a record of miles they walked during eight weeks. Teams and school classes 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.

Passenger Safety. Based on a study conducted by the National SAFE KIDS in 2002, more than 81% 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.

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, reducing unprotected sun exposure, maintaining a normal weight, and being physically active. Cancer deaths can be reduced by early detection and receiving appropriate medical care. Rural populations in Texas are more at risk for death from cancer because 30% are over 65 years old and accessing early detection services and knowledge about the need for early detection, as well as 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 and seek proper screening and medical care.

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 VFIC 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., Germany, and the United Kingdom. The membership represents seed companies, grocery stores, restaurants, grower/shippers, national associations, nutraceutical companies, processors, and individuals.

Diabetes Education. Diabetes is a significant problem affecting 1.3 million (8.1%) of adult Texans diagnosed (Texas Behavioral Risk Factor Surveillance System(BRFSS, 2003) and another 343,000 adult Texans (NHANES age-adjusted prevalence estimate of 2.4) not yet diagnosed. While the number of children in Texas having diabetes is unknown, it is believed that between 8 to 45 percent of newly diagnosed cases in children is type 2 with most overweight or obese³. 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. Extension diabetes programming efforts educated clientele in some 1,938 programs with 51,022 group contacts and 73,159 individual contacts with near 46 percent participants representative of under served populations. In the 2003 to 2004, some 131 trained Extension agents in Family and Consumer Sciences provided the leadership role in building the health coalitions in their 134 Texas county diabetes programs. With more collaborations, coalitions, and partnerships within the medical communities in local counties, Extension has gained respect in their leadership role of the health coalition as a reliable resource for nutrition and self care.

Better Living for Texans. An estimated 15% 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 2003, the USDA reported that nearly 15% of Texas households had experienced food insecurity during the previous 12-month period. This is higher than the 11% reported nationally. 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 04 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
	<u>FY 2004</u>
Program 5 – General Health Education	1,029
FTEs	29.47
 Program 6 – Extension Diabetes Education	 542
FTEs	24.16
 Program 7 – Better Living for Texans	 506
FTEs	22.42
 Total TCE Allocated Resources Goal 3	 2,137
FTEs	89.23

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

Source of Funding and FTEs

Federal Funds (\$ x 1000):	213
State Funds (\$ x 1000):	488
FTEs:	5.66
Number of Projects:	28
Number of Publications:	100

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 Task Force on Preventive Health Services, 29% of American adults are not physically active at all, and 50% are not active enough to achieve health benefits. Only 27% of students in grades 9 to 12 engage in the recommended amounts of moderate-intensity physical activity. Daily participation in high school physical education classes dropped from 42% in 1991 to 32% in 2001. 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.

Walk Across Texas is a physical activity program aimed at helping participants establish the habit of physical activity with support from their peers. County Extension agents in 60 counties across Texas organized teams of eight people and school classes to keep a record of miles they walked during eight weeks. Teams and school classes 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, including 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, Florida and Illinois have requested the manual to adapt this program for their states.

Passenger Safety Education. Based on a study conducted by the National SAFE KIDS in 2002, more than 81% 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.

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 State Health Services (TDSHS); 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. The project distributed 19,188 resources and incentive items to support occupant protection. The project's two Rollover Convincers were viewed by over 157,450 participants.

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, reducing unprotected sun exposure, maintaining a normal weight, and being physically active. Rural populations in Texas are more at risk for death from cancer because 30% are over 65 years old and accessing early detection services and knowledge about the need for early detection, as well as 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 and seek proper screening and medical care. Rural youth participated in Health Tech camp where they received training about cancer prevention strategies and then helped create peer relevant web sites: <http://coolshade.tamu.edu> , <http://dontdip.tamu.edu> , and <http://nobutts.tamu.edu> .

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 Winning Against Tobacco (S.W.A.T.), was implemented in Van Zandt county in 2001-2003. A S.W.A.T. manual was produced identifying the process rural communities may use to reduce youth tobacco use. Additional funding was awarded by the Texas Cancer Council in 2004 to replicate and expand S.W.A.T. in three additional northwest Texas counties with double the national rate of tobacco use (22% vs. 43%) by high school students. The comprehensive community approach includes a community advisory group in each of the counties, a peer education team in each county (trained in a summer leadership camp), community assessment, and implementation of the nationally recognized Towards No Tobacco curriculum in schools. In addition, Harrington Cancer Center and the American Cancer Society will be providing cessation information and services in these counties.

Internal collaborations include the 4-H program. External linkages have been formed with the Texas Cancer Council, and a variety of others including M.D. Anderson Cancer Center in Houston, American Cancer Society, Harrington Cancer Center in Amarillo, the Texas Comprehensive Cancer Council, a variety of 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

Walk Across Texas. Initiated in 1996, over 85,000 Texans have participated and significantly increased their physical activity level. In 2004, 14,073 people, including 4,579 school children, participated in Walk Across Texas. Participant mileage increased from 15.7 miles in week one to 17.5 miles in week eight. Consistently, 50% of the participants report a side benefit of feeling less stress. A Kent county walker reported: "I credit participation in Walk Across Texas with an improved yearly physical exam. I had lost 10 pounds and both my blood glucose and cholesterol were down. A participant in Dallas county noted: "After diligently walking and jogging for the past 8 weeks as well as watching my food intake...as of today I have lost 8 and a half pounds for a total loss so far." A Caldwell county resident reported: "I lost over 20 pounds during this 8 weeks." The net present value of both the potential health care cost savings and lost wages is \$173.8 million for Walk Across Texas participants.

Passenger Safety. Every dollar spent on a child safety seat saves this country \$32 in health care costs. In 2004, Passenger Safety made sure that 871 children were correctly restrained. At an average cost of \$40 each per child safety seat, this represents a total of \$1,114,880 in healthcare costs to Texas. In 2002, the use of child restraints saved an estimated 376 lives. If 100 percent of motor vehicle occupants younger than age 5 had been protected by child safety seats, an estimated 485 lives (an additional 109 lives) could have been saved in 2002. From 1975 through 2002, an estimated 6,567 lives were saved by the use of child restraints (child safety seats or adult belts).

Data from the Passenger Safety project indicates that over 871 child safety seats were inspected and parents were instructed how to correctly install their child safety seats. 640 new child safety seats were distributed by project members and project-trained agent/technicians. 157,451 Texans attended events where they viewed the two project Rollover Convincers to increase their awareness of the importance of using seatbelts consistently. The project distributed 19,188 resources and incentive items to support occupant protection.

Cancer Risk Reduction for Rural Texans also had an impact on its participants. A total of 78,667 people were directly served by this project. 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. Women participating in sessions focused on early detection of breast cancer report they intend to seek regular mammograms. 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, tobacco use, and breast cancer. 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.
14,073 participants.

Rural Passenger Safety Education

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

Cancer Risk Reduction for Rural Texans

Number of people completing non-formal education programs on health promotion.
78,667 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. 14,073 people, including 4,579 school children, participated in Walk Across Texas. Participant mileage increased from 15.7 miles in week one to 17.5 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 VFIC 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., Germany, and the United Kingdom. The membership represents 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 naturally occurring bioactive compounds found in carrots, grapefruit, melons, onions, peaches, peppers, plums, and watermelon.

The VFIC conducts research and Extension in four major areas: 1) health promoting bioactive compounds through *in vivo* and *in vitro* studies; 2) postharvest handling and processing—develop techniques for optimizing 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—optimize levels of naturally-occurring compounds that help prevent human disease.

VFIC research developments include:

- 'BetaSweet'TM 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.
- The TAM Mild Habanero is a new, high-yielding, low-pungency pepper variety with enhanced levels of beta-carotene. It contains a mere 150 ppm total capsaicin compared to more than 12,500 in the typical Habanero. It is intended for both fresh market and processing applications where Habanero flavor but not extremely high heat is required.
- 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.

Isolation, characterization and purification of citrus bioactive limonoids and flavonoids research has reduced the number of conventional purification steps. A patent application is being submitted for this revised process. Animal studies using certain bioactive limonoids, flavonoids and grapefruit pulp resulted in reduction of oral carcinogenesis and carcinogen induced colon cancer. Citrus limonoids have also shown to lower hamster LDL/HDL cholesterol and prolong lag time of LDL oxidation.

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 18 students completing 10 masters of science and 11 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 8 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 totaling over 4,300 children between 1998 and 2004. 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 in Fruits and Vegetables to Improve Human Health (<http://phytochemicals.tamu.edu>)” was created and funded through the USDA Challenge Grants. This course is team taught by 22 faculty from across the United States to over 65 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.

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 Industry Support – CA, MI, MO, OR, TX, VA, WA, WV

International Industry Support – UK, GER

Multi-State Education – TX, MI, IN

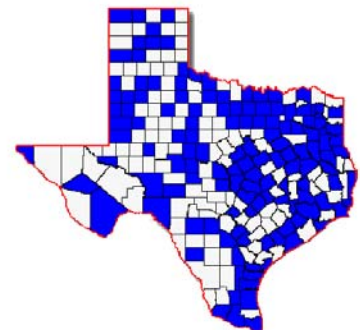
Integrated Research and Extension: Research and Extension faculty cooperate to develop program in general health and foods for health.

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 1.3 million (8.1%) of adult Texans diagnosed [Texas Behavioral Risk Factor Surveillance System(BRFSS, 2003)¹ and another 343,000 adult Texans (NHANES age-adjusted prevalence estimate of 2.4)² not yet diagnosed. 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.

Developed in 2002 and updated yearly are 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*TM 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 ensure 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. During 2002 to 2004, this process resulted in total of 131 trained agents in 134 Texas counties selected according to their performance and ability to plan, implement and evaluate their programs as shown in the map with blue representing diabetes programming in designated counties.



In addition to the *Do Well, Be Well with Diabetes*TM 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*TM. The members looked at curriculum developed by the Cooperative Extension Nutrition and Health Specialists in Georgia, West Virginia and New Mexico. The Texas team development of the cooking school curriculum included: introduction, evaluation (registration, wrap-up, reunion) and the lessons (Resource Design and Subject Matter Concepts)

- Lesson 1 Carbohydrate (starchy and non-starchy), sweeteners
- Lesson 2 Reducing fat, saturated fat and trans fatty acids
- Lesson 3 Reducing sodium and increasing fiber
- Lesson 4 Holiday meal preparation with diabetes in mind

In addition, approximately 5 recipes with tip sheets were included in the 4 lessons. Some 47 recipes were created, analyzed for nutritional value, evaluated for acceptability, flavor, visual appeal, tested by county clientele and compiled by Agricultural Communications Marketing editor into a diabetes cookbook with a regional Texas culture flair. The pilot training was conducted early in 2004 to provide practical application of the subject matter taught during the first 12 diabetes lessons plus food preparation, cooking up a show, food safety as well as the nutrition concepts and some self-care tips.

The preliminary results from the pilot testing in 12 Texas counties of the cooking school were as follows: The 126 registrants were 62 years of age with 82 percent female. Participants indicated that they buy and prepare their food eaten at home. Less than 10 percent had ever attended any diabetes cooking school. The average hemoglobin A_{1C} reported was 7 which is within recommendations of the American Diabetes Association. The first Statewide training of additional 30 agents was conducted in the fall. Two subsequent training opportunities for agents are scheduled for the spring and fall, 2005. Future training will be offered until all county agents trained in advanced diabetes *Do Well, Be Well with Diabetes*TM are trained.

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.

51,022 group contacts and 73,159 individual contacts Number of Participants Reached
~46 % of Participants Under served

Partnerships and cooperative relationships will be established or maintained with:

External: Texas Commission for the Blind, Texas Diabetes Program - Texas Department of State Health Services, 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. In 2004, funding was provided by the Texas Department of State Health Services-Texas Diabetes Program to provide culturally-sensitive video purchase to assist in reaching more of the under served ethnic audience in Texas.

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

Texas Cooperative Extension

Summary of Outcome Measures

Extension diabetes programming efforts educated clientele in 1,938 programs with 51,022 group contacts and 73,159 individual contacts with approximately 46 percent representative of under served populations. In the previous four years, the county programs attracted more than half of consumers with diabetes and health professionals in an average of 134 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 approximately 102 county programs continuing for 2003 and another 45 outcome programs reported in 2004 data.

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 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. In 2005, the 45 counties with selected outcome program summaries included: Angelina, Archer, Atascosa, Brazoria, Brazos, Brewster/Jeff Davis, Burlleson, Cass Cherokee, Comal, Crockett, Dallam, Dawson, El Paso, Floyd, Haskell, Hockley, Hopkins, Hunt, Karnes, Kaufman, Kent, King, Lamar, Limestone, McClennan, Medina, Menard, Milam,

Nacogdoches, Navarro, Nolan, Ochiltree, Panola, Parker, Pecos, San Patricio, Sherman, Smith, Sutton, Taylor, Titus, Walker, Waller, and Young.

2004 Key Results of *Do Well, Be Well with Diabetes*TM

In 2004, some 1,319 registrants diagnosed with diabetes with mean age of 63 years of age in *Do Well, Be Well with Diabetes*TM. Of the 1,319 registrants, 74 percent were females; 71 percent Anglos; 16 percent Hispanics; 9 percent African American; 2 percent Native Americans; and 2 percent other ethnic groups. Of the 1,319 registering for the course, 750 completed both the pre- and post- tests. However, the 6 month follow-up produced only 170 useable data sets for comparison of results of the three evaluation instruments. Though the sample was small, the positive changes participants made were worth noting. Here are some of the most significant of those results:

- ◆ Of 1,319 registering, 892 (67%) indicated that they had no diabetes classes before joining this Extension diabetes program.
- ◆ For the past two years, 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 10 times.
- ◆ Before the program, the number of participants who tested their blood glucose themselves was 1,109 (77 percent of those beginning the program—as opposed to having it done by a doctor, or someone else, or no one at all). After the classes with 170 data sets, 150 (88 percent) reported testing.
- ◆ Before the classes started, the average blood glucose reading before meals for 1,319 participants was 135 milligrams per deciliter. Six months follow up classes, the average blood glucose before meals reading for 134 participants dropped to 115 mg/dL.
- ◆ During registration, the average blood glucose reading before bedtime for 1,319 participants was 145 milligrams per deciliter. Six months follow up classes, the average blood glucose before meals reading for 87 participants dropped to 134 mg/dL.
- ◆ Before classes, 704 participants reported working out for 33 minutes, 5 days per week. Some 21 percent reported doing no exercise at all. After the classes, 68 percent reported that they exercise 30 minutes, 4.2 times per week. Only 12 percent reported no exercise at all.
- ◆ On the pre-test, over 42 percent of the 1,319 participants reported following no meal plan to manage their condition. On the post-test, that figure dropped to 35 percent of the 170 respondents. Other meal plans (regular meals with no added sugar; diabetes exchanges; carbohydrate counting) continue to be ordered by their physicians with little variation between that time period.
- ◆ Net savings for female participants are estimated at \$67,123 and for male participants at \$52,769 for a total estimated economic benefit of \$73.8 million dollars.

Other Outcome Indicators

Awareness of Managing Food Choices Through Healthful Eating To Control Blood Glucose
51,022 group contacts and 73,159 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
51,022 group contacts and 73,159 individual contacts awareness of importance of adequately monitoring blood glucose levels 4 times a day

Awareness of Exercising to Control Blood Glucose
51,022 group contacts and 73,159 individual contacts awareness of importance of engaging in daily exercise

Visiting with Health Care Provider
Number of individuals visiting with physician, dietitian, nurse, diabetes educators - Data not available

Taking Prescribed Medication and/or Insulin
Number of individuals taking prescribed medication and/or insulin - Data not available

Summary of Output Measures

(via 12 individual districts summaries for diabetes, diabetic individuals)

1,938	Number of group method contacts
49,084	Number of people completing programs (Group Methods)
73,159	Number of participants served by (Individual Methods) (Trend is that clientele with diabetes continue to seek information via individual assistance)
31,061	Number of written diabetes educational materials distributed via newsletters, self-study guides and others. Diabetes resources will be included in a diabetes curriculum Phase 1. <i>Do Well, Be Well with Diabetes</i> TM , a 12-week Nutrition and Self-Care TCE Curricula and Phase 2. <i>Cooking Well with Diabetes</i> , a 4-week diabetes cooking school curriculum 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/> HERO newsletters on diabetes <http://fcs.tamu.edu/health/>, diabetes nutrition and health related bookmarks organized <http://calcium.tamu.edu/mickey.html> .

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, i.e., Diabetes Education.

C. Sources of Federal Funds

TCE: Smith-Lever and State Matching

TAES: None

D. Scope of Impact

Multi-State Extension: TX, MO, NM, WV, KY, KA, GA

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; shared qualitative diabetes research with specialists and administrators in attendance at the Priester Conference (St. Louis, MO, 2004) and various outside partnerships/support (see Target Audience).

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

A. Description of Activity

An estimated 15% 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 2003, 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 2003-2004 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 208 counties across Texas, resulting in 214,803 direct educational contacts. Of 214,803 contacts, 36.5% were made to Caucasian, 13.1% to African Americans, and 49.6% to Hispanics. Less than 1% of those contacts were made to individuals who identified themselves as Native American or Asian American. Women and youth comprised more than half of the educational contacts.

Internal linkages were developed with several sources. Nutrition specialists recommended curricula and educational materials, and participated in the training of agents and paraprofessionals. Linkages were also developed with external sources. TCE collaborated with other agencies, including the Texas Department of State Health Services (WIC program), the Texas Health and Human Services Commission (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:	14,173
# of direct educational contacts:	213,803
# educational contacts via newsletters and self-study guides	73,730

mass media

# news releases prepared	1,698
# news outlets receiving releases	1,157
# radio releases prepared	1,303
# radio stations receiving releases	222
# television releases prepared	52
# 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 2003-2004 year. Trained interviewers administered the survey to the 458 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.

Food	<u># servings consumed</u>		
	Before (Mean value)	After (Mean value)	Significance
fruits	1.8 ^a	2.8	.05
vegetables	1.8	3.0	.05
milk/dairy products	2.1	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 to identify one eating habit they had changed as a result of attending the BLT program. Of the three-hundred and thirty (72%) respondents who reported a change, one hundred and five (32%) reported eating more fruits and vegetables, forty-two (13%) reported making healthier food

choices, and twenty-nine (9%) reported eating less fat. Other changes in eating habits identified include eating less junk food, eating healthier portions of food, and drinking less soda.

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 103 minutes. After BLT, the average amount of time food was left out dropped to 32 minutes. With respect to hand washing, more than 72% of respondents reported that before BLT, they “always” washed their hands before preparing food. After the program, this percentage significantly rose to more than 90%. 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 80.3% (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 one-half (47%) of participants identified one food safety behaviors they had changed. These behaviors include: storing food properly (38%), washing countertops, tables and utensils (11%), and thawing foods properly.

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 “good” or “very good” more than tripled from 36% before BLT to 91.7% afterwards. Likewise, the percentage of participants who rated their ability as “poor” or “very poor” fell from 22.4% before BLT to only 0.4% 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%) of the respondents reported that they planned their meals “always” or “most of the time.” However, this figure more than doubled (62.5%) after the BLT program. Less than half (40.1%) of respondents reported that they shopped with a list “always” or “most of the time” before attending the BLT program. After the BLT program, however, that percentage rose to 73.8%. A similar trend was noticed when respondents were asked about the extent to which they compared prices. Prior to attending the BLT program, 56.3% of respondents reported comparing prices when grocery shopping either “always” or “most of the

time.” After attending BLT, that percentage rose to 86.4%. Participants were asked to estimate how much of their own money, on average, they were spending on groceries before and after the BLT program. On average, each person reduced their out-of-pocket food expenses each month by 15.3% (or \$34.55 per month) – from \$226.38 prior to BLT to \$191.83 after BLT.

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 a reduction in their monthly out-of-pocket food expenses. 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 on limited budgets.

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.

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>).

Goal 4: Greater harmony between agriculture and the environment

Overview

Texas Cooperative Extension and Texas Agricultural Experiment Station (TAES) scientists are engaged in several efforts to develop agricultural and natural resources programs that protect the environment and increase environmental stewardship.

Extension and TAES efforts to better protect water quality are based on the Extension model of developing monitoring and evaluation programs to generate objective, timely and accurate research-based information. Later, Extension encourages stakeholders to take this information and incorporate it into decision-making processes. Extension demonstration projects verify whether the best management practices work well in the field and give others an opportunity to observe first-hand the benefits of improved management strategies and technologies. In many activities, education programs are developed for youth and are presented through the public schools, while additional education programming is directed for adult audiences and other stakeholders.

A few examples of Extension and TAES water quality programs during 2004 are shown below:

- * Extension specialists and TAES researchers are engaged in monitoring and outreach efforts to prevent phosphorus in dairy manure from running off into watersheds of the Bosque River and the Leon River. The project, led by Extension dairy nutritionist Barry Lambert and TAES researcher James Muir, is a collaborative effort that involves scientists from TAES and Tarleton State University. The overall goal of the study is to develop changes in dairy farm management that will lessen phosphorus runoff to the region's waters, including such efforts as improving phosphorus recycling on the farm, using different plants as vegetative buffers, and adjusting cattle feeds so dairy cows excrete less manure.

- * John Jacob of Texas Cooperative Extension and the Texas Coastal Watershed Program is leading several efforts to encourage homeowners to adopt best management practices that will lessen pollutants associated with stormwater runoff. Jacob has developed educational materials about how landscapes can be developed that do not require extensive inputs of pesticides, thus protecting water quality, and has developed computer programs elected officials and citizens can use to evaluate how smart growth principles have the potential to reduce runoff and nonpoint pollution. Jacob and Ric Jensen of the Texas Water Resources Institute recently developed an annotated bibliography that describes Extension publications about water quality and water management issues. The bibliography will be made available to stormwater managers throughout the region who may then choose to distribute selected fact sheets to the public.

- * In the Texas High Plains region, Extension specialists have established the Texas Precision Agriculture program in order to conserve water, apply irrigation water efficiently, increase yields, and protect the environment. Extension irrigation specialist Dana Porter of the Texas A&M University Agricultural Research and Extension Center in Amarillo has been teaming up with TAES researcher Albert Schubert of the Texas A&M University Agricultural Research and Extension Center in Lubbock to evaluate the use of precision irrigation and low energy precision application (LEPA) methods in peanut production. Results suggest that precision agriculture offers the promise of developing improved peanut irrigation strategies. In another study, TAES researcher Robert Lascano of the Lubbock Center led a team project to evaluate if sensors placed on center pivot irrigation systems near Halfway could provide the precise data needed to implement precision agriculture methods on corn and cotton production.

* Extension specialists Mike Masser and Peter Woods of the Wildlife and Fisheries Sciences Department are working with county Extension agents in Matagorda, Calhoun, and Wharton counties to develop markets for catfish raised in coastal aquaculture operations. The program is based on working with aquaculture producers and cooperatives companies in the private sector, as well as regional water suppliers. The effort developed workshops to present information about such issues as how to start up and market farm-raised catfish; water quality management in fish ponds; and culminated in the creation of the Catfish Association of Texas.

Sources of Funding and FTEs

TCE Funding: Smith Lever and State Matching

	\$ X 1000
	Actual
	<u>FY 2004</u>
Program 8 – Water Quality & Quantity Management	4,356
FTEs	196.35
Allocated Resources Goal 4	4,376
FTEs	205.24

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

Source of Funding and FTEs

Hatch Funds (\$ x 1000):	1,183
State Funds (\$ x 1000):	7,130
FTEs:	58.18
Number of Projects:	180
Number of Publications:	679

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 working with the Texas Water Resources Institute and other partners to develop and implement comprehensive research, outreach, and extension programs. Common goals of these programs include the following:

- * 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.

Highlighted Programs

Water Quality Screening and Source Water Protection

Extension Specialist Monty Dozier of the Texas A&M University Soil and Crop Sciences Department is leading several efforts to teach individual homeowners and the managers of small water systems about water quality protection. Dozier has implemented a program in which he provides hands-on instruction about water quality screening to homeowners in all regions of Texas. At most sites, the education about water quality screening is combined with youth education programs. Dozier follows up these efforts by encouraging homeowners with their own

water wells to submit samples for analysis to the Texas A&M University Water Testing Laboratory. Dozier has also teamed up with local officials in Mills County to evaluate well water quality and, based on these analyses, to assess which home water treatment systems might provide the best treatment. Dozier is also working with Extension Community Development specialist Gene Theodori and Ric Jensen of the Texas Water Resources Institute to develop workshops for managers of rural water systems. The workshops, funded by the Environmental Protection Agency, will present information about how water systems can plan for homeland security issues, evaluate rate setting methods, and better protect source water quality.

Groundwater Education Efforts

Texas Cooperative Extension specialists and Texas A&M University researchers have developed an ongoing education program to provide continuing education to groundwater district managers. This effort is led by Bruce Lesikar, an Extension specialist in the Texas A&M University Biological and Agricultural Engineering Department; researcher Ronald Kaiser of the Texas A&M University Recreation, Parks and Tourism Sciences Department, and researcher Valeen Silvy of the Texas Water Resources Institute. Through this program, several workshops and conferences have been carried out to present such issues as groundwater marketing, the expanded role of groundwater district management, and how third parties may be affected by groundwater transfers. With the assistance of Rachel Alexander of TWRI, the program has created several innovative CDs, DVDs, videotapes, and publications. This program was recently honored by the American Society of Agricultural Engineering as having developed outstanding educational programming.

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. Agricultural production is vital to the Texas economy. These production systems required chemical inputs for viability. These inputs are managed to minimize impact on our ecosystems. Several watershed management programs are being implemented to raise awareness regarding the ecosystem and how all of the activities in an ecosystem are interrelated. Delivery methods included one-on-one contacts and producer meetings conducted by Extension agents and specialists. Total attendance at these events was 79,917 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 228,721 contacts.

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 2004, more than 950 people (roughly 16% of the septic systems professionals in Texas) took part in these classes. Three new courses were developed during the year to assist in attracting new students.

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 Comanche and Erath Counties, for example, we screened 97 private water well samples for the presence of fecal coliform bacteria and determined TDS and nitrate concentrations: 14 samples (14.4%) were positive for fecal coliform, average TDS was 630 ppm with a range of 280 to 2,040 ppm, average nitrate-N was 4.6 ppm with a range of 1 to greater than 30 (limit of my equipment) ppm. 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.

Water policy is a key issue when managing a limited water resource. Programming raises awareness of everyone’s needs regarding the water resource. Allocating this limited resource is challenging and can result in intense local negotiations. The water planning framework in Texas allows redevelopment of the water plan every five years. Extension and research professionals are delivering programs to raise awareness of water management strategies and what policies can be implemented to share this valuable resource to meet all needs: domestic, municipal, agricultural, industrial, recreational, wildlife, aquatic and marine. Delivery methods included one-on-one contacts and producer meetings conducted by Extension agents and specialists. Total attendance at these events was 46,717 contacts.

Cooperative Extension professionals in the Wildlife and Fisheries Sciences Department at Texas A&M taught nearly 1800 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, catfish aquaculture, and aquatic ecology.

Through programs of the Texas Water Resources Institute and Research and Extension personnel with the Recreation, Parks, and Tourism Science Department, City council members, mayors and water conservation and utility staffs were surveyed in twenty-eight cities along the Rio Grande Basin in New Mexico and Texas. Information was collected on water conservation strategies including the preference-feasibility, barriers to water conservation and the definitions of water conservation.

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.

Groundwater remains an issue of concern. To assist landowners, concerned citizens and groundwater district managers in keeping current with water marketing issues, a conference discussing groundwater marketing was conducted in three different locations across Texas. This program provided the base knowledge about Texas water law and issues landowners should consider before marketing water from their property. Approximately, 300 people participated in the seminars and gained knowledge regarding their water resources.

Throughout 2004, scientists with the Texas Agricultural Experiment 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 Grande 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. Some of the approved projects are currently being constructed in the irrigation districts.

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. The teams of research and extension faculty are developing educational programs targeting producers that build upon information gained through the research activities. These materials are being delivered through traditional and electronic delivery mechanisms.

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. Initial studies are being completed and the results are demonstrating the contamination is originating from several sources. This information is assisting in the development of educational materials demonstrating that all sources of contaminants contribute to the water quality problems and thus everyone needs to be a solution to the problem. This work is supported by the U.S. Environmental Protection Agency and the Texas State Soil and Water Conservation Board.

Several programs are continuing, 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.

Researchers from several disciplines, including Biological and Agricultural Engineering, Rangeland Ecology and Management, and Wildlife and Fisheries Sciences, are conducting 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-1128, 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 assists 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. Changes in family life over the last several decades have influenced the ability of family members to adequately address the needs of children and aging adults. Families need access to research-based educational resources and training programs to assist them in their job of raising responsible citizens. According to recent statistics, over one-fourth of today's children reside in single-parent households, where they are much more likely to experience poverty (Forum on Child & Family Statistics, 2004). Nearly five million infants, young children, and teens live in households headed by a grandparent. Over 20 million children are currently living apart from their biological fathers. Researchers have found that 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. Nationally, youth related issues include Weight Management, Harmful Substance Abuse, Teen Sexuality, Accepting and Respecting Others, Youth Violence, Unsupervised Time, Youth Literacy, and Death by Accident. During 2004, Texas Counties identified a number of youth related issues which strongly parallel national concerns. Texas 4-H offers nine areas of program delivery to meet the needs of a diverse state with complex issues. 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 2004, Texas Cooperative Extension conducted many successful educational programs which were expanded via partnerships and collaborations. Historically, these partnerships and collaborations have been with citizen groups, other universities, other agencies and key stakeholders. The Texas Community Futures Forums were conducted in all 254 counties with key input from many of these partners. 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 04 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
		<u>FY 2004</u>
Program 9 – Financial Management Education		654
	FTEs	28.99
Program 10 – Parenting		1,539
	FTEs	68.11
Program 11 – Life Skills Education		2,094
	FTEs	92.70
Program 12 – Volunteer Development		1,122
	FTEs	49.86

Program 13 – Partnerships & Collaborations		354
	FTEs	15.70
 Program 14 – Community Development		1,640
	FTEs	14.49
 Allocated Resources Goal 5		8,433
	FTEs	381.32

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

Source of Funding and FTEs

Federal Funds (\$ x 1000):	132
State Funds (\$ x 1000):	306
FTEs:	4.06
Number of Projects:	30
Number of Publications:	46

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. The bankruptcy filing rate declined in 2004 for the first time since 2000, but expected to increase in the first quarter of 2005, based on trends in consumer debt levels, credit default rates, and credit card charge-off rates, all of which have increased.

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 and maintained 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 and a small grant for training new Extension Agents was obtained in 2004. 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 2000plusSM 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, although Harris County (Houston, Texas) continues to publish a Money 2000plusSM Newsletter with a large circulation. 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. Wi\$e Up began in 2003 and will continue through 2005.

B. Impact of Programs

Financial Literacy Coalition of Central Texas. In 2004, the Financial Literacy Coalition of Central Texas (FLCCT), under the leadership of Travis County Extension, had a burgeoning increase in participation from 278 people reached in 2003 to 1,270 people reached in 2004. The adults and youth participated in financial education classes offered through a five or ten-week “Money Smart,” “Money Wise” or “Welcome to the Real World!” program series. Quantitative findings based on post/pre-tests data showed that the majority of the participants (76%) made significant improvement in their desire to change the following personal money management behaviors, compared to only 24% before the program began: build a relationship with a financial institution, develop and keep a spending plan, implement a savings plan, decrease spending, understand their credit history and how to make a credit card work for them, how to determine the right loan for their needs, know what they are borrowing before they buy, and assess their readiness to buy a home. They increased their knowledge significantly about their rights as banking consumers, how money can grow when you save, differences between types of savings and investment accounts, how to order and read a credit report, the different types of consumer installment loans, the different mortgage programs and the basic terms used in a mortgage transactions. Collaborators in program/evaluation: Collaboration is important to the success of any education effort. In 2004, the FLCCT trained 78 volunteers to deliver in a classroom format the FDIC award-winning Money Smart, the University of Illinois Cooperative Extension All My Money and Welcome to the Real World! and the Consumer Action and Capital One MoneyWi\$e program curricula. 37 new volunteer instructors were trained in 2004 and taught 88 personal money management classes to 1,270 under-served, diverse, and non-traditional audiences. 32% of the volunteer instructors are bilingual and presented the lessons in Spanish allowing low-income Americans, new immigrants and other adults outside the financial mainstream to enhance their money management skills. The volunteer instructors contributed over 12,876 volunteer hours to the program. The FLCCT set up the Partner Expectations Program for those organizations wishing to sign an agreement with the FLCCT outlining their commitment. 15 partnerships were established in 2004 with organizations, schools, and businesses. These partnerships are key in the success of the FLCCT outreach efforts. They providing the marketing

and publicity, participant recruitment, sufficient classroom facilities and set up, childcare if needed, appropriate accommodations for participants with disabilities, and other support as determined by the organization and the FLCCT. The organizations included: WorkSource Career Centers, Neighborhood Housing Services of Austin, Inc., Manos de Cristo, ACCION Texas, Metz Elementary School, La Fuente Learning, YWCA, El Buen Samaritano Episcopal Mission, Texas Rural Legal Aid, Austin Habitat for Humanity, Austin Asset Building Coalition, Friendship International, and Garza High School. In the Spring 2004, two workplaces joined the FLCCT Partner Expectations Program who saw in their employees and staff the need for education about money management issues: Texas Property & Casualty Insurance Guaranty Association and Travis County Employee Wellness Program.

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. 10,756 people participated in the program, 748 were contacted to evaluate the program and usable information was received from 401 respondents. The findings showed that:

- 94% had learned new information
- 50% had learned new information for training others
- 77% learned new methods of saving money
- 48% learned new methods of tracking savings
- 66% learned new methods of planning bill paying
- 59% learned new methods to control spending
- 76% 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 an Inmate Re-entry Life Skills Program to prepare women to handle challenges they will face upon their transition into the community.

- 34% indicated that they learned the concept of budgeting
- 47% indicated that they learned how to set financial goals
- 43% learned new methods of saving
- 28% stated that they learned new methods of tracking savings
- 77% stated that they learned new methods of planning bill paying
- 44% stated that they learned methods to control spending
- 37% indicated they learned new ways to stretch their food dollar
- 43% indicated they learned about credit reports and how they are used
- 44% indicated that they learned how to establish, manage and repair credit
- 40% indicated that they learned how to safeguard and prevent identity theft.

Workforce Investment. In Johnson County, Extension collaborated with the Cleburne Workforce Center to conduct weekly seminars on job skills and career transitions. In 2004, the weekly seminars had a total attendance of 773. Seminars from January through March were conducted as preparation for a major Jobs Expo in early April, which drew over 600 job seekers, 29 volunteers, and 17 employers; 313 job seekers completed evaluations indicating that 100 job seekers received at least 1 job offers at the Jobs Expo, and 80 job seekers not receiving offers at

the Jobs Expo were invited to personal interviews at a later date. A total of 146 were requested to submit a resume. Potential economic impact to the community of this Expo is estimated to be \$1.248 million based on 100 new jobs at an average wage of \$6 per hour.

Families Moving Ahead. This curriculum was revised by Texas Cooperative Extension to replace the original TCE curriculum, "Building Self-Sufficient Families." A new website was developed which make it possible for trainers to download educational materials they need to conduct training workshops for participants. In Bexar County, a train-the-trainer training was held for 40 attendees whose evaluation forms revealed that they found the budget information, worksheets, visual materials, and a website helpful in their work in case management. Trainees used the website 77 times to download forms and seek additional information. A second programming effort in San Antonio was the Family Alliance Council training that reached 200 people. Conference evaluations from 126 indicated that the professionals gained knowledge of new resource and referral sources. As a result of the training, staff of the Bexar County Health and Human Services Division have changed the curriculum taught by co-workers to the more than 1,200 families that seek assistance annually.

Welcome to the Real World Program. Bell County youth participants in this simulated learning program about money management completed an evaluation of the program which demonstrated that 57% learned how to explore career possibilities, 46% learned how to open a savings account, and 75% learned how to balance income and expenses. Feedback from parents indicated the course was a valuable introduction to career exploration for their children.

Financial Planning for Higher Education Costs. In Zavala County, educational efforts addressed the importance of financial planning for higher education costs, taking advantage of financial gains from 4-H animal projects. With the assistance of parents, financial planning professionals and the financial contributions from the private sector, 30 new higher Education Savings Accounts were established by Zavala County youth in 2004. Prior to this program, there only 11 such accounts established by 4-H Youth who participate in the Zavala County Junior Fair Animal project auction sales. The 30 accounts represent an almost 50% increase in accounts. Efforts will continue in 2005.

NEFE High School Financial Planning Program®. The High School Financial Planning program is evaluated through a national impact evaluation, conducted most recently during the 2003-2004 academic year. The study showed that young people who studied the curriculum for as little as 10 hours significantly increased their understanding of money management and improved their financial behavior in ensuing months, suggesting that even relatively limited exposure to financial education can impart significant, lasting and practical financial knowledge to young people. Childress County Extension educator conducted a pre- and post-test of students' knowledge of basic financial terms related to insurance, credit and investments. With usable evaluation data from all 75 participants, the pre-test score average was 56, but post-test score average was 75. The High School Financial Planning Program was used as the teaching resource.

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.

Operation READY. Through funding from Department of Army – U.S. Community and Family Support Center, the curriculum known as Operation READY is under revision. These materials prepare soldiers and families for all aspects of family readiness during deployment, including financial readiness. Texas Cooperative Extension originally developed the materials in 1992 and has been performed each major revision. Revised materials will be available in 2005.

Summation of contact data for 200 indicate that:

64,606	contacts were served by group methods
143,405	contacts were served by individual methods
340,474	contacts were served by direct methods through Better Living for Texans
188,306	contacts were served by mass media (newsletters)
77,536	contacts were served by volunteer leaders
814,327	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

Changes in family life over the last several decades have influenced the ability of family members to adequately address the needs of children and aging adults. Families need access to research-based educational resources and training programs to assist them in their job of raising responsible citizens. According to recent statistics, over one-fourth of today's children reside in single-parent households, where they are much more likely to experience poverty (Forum on Child & Family Statistics, 2004). Nearly five million infants, young children, and teens live in households headed by a grandparent. Over 20 million children are currently living apart from their biological fathers. Researchers have found that 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. Over 60% of children from birth through age 6 (not yet in kindergarten) received some form of child care on a regular basis from persons other than their parents (Forum for Child & Family Statistics, 2004). 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. In the state of Texas, there are over 23,000 licensed or regulated child care providers caring for over 760,000 children under the age of 13. Child care is the 16th largest industry in the state, generating over 145,000 jobs and \$2.3 billion in wages for Texans (Texas Workforce Commission, 2003). 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 state of Texas.

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
Provider's attending classes	28,315	19,607
Individual contacts	29,518	13,867
Contacts via newsletters & self-study guides	25,067	31,339
Volunteers trained	299	1,090
Individual contacts by volunteers	673	6,721
Individuals attending volunteer led programs	3,215	15,608
Totals	87,087	88,232
Combined Total	175,319	

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, in partnership with the Texas Department of Aging and Disability Services, the Texas Legal Services Center, the Area Agencies on Aging of Texas and the Texas KinCare Taskforce, continues to provide education and support to grandparents rearing their grandchildren. Extension sponsored or helped coordinate conferences and workshops in Travis, Dallas, Lubbock and El Paso Counties. In addition to the support that Extension offers through the Grandparents Raising Grandkids internet site (<http://grandparentsraisinggrandkids.tamu.edu>), County Extension Agents were responsible for the formation of 11 support groups in counties around the state. Extension has received grant funding from the Brookdale Foundation and the Rio Grande Council of Governments to support its work with grandparents rearing their grandchildren.

Child Care. In 2004, Texas Cooperative Extension conducted 11 major multi-county/regional child care conferences resulting in the training of over 3,000 child care providers from 60 Texas counties. Providers at these conferences received over 11,000 clock hours of credit, helping them fulfill state-mandated training requirements. In addition to these face-to-face trainings, county Extension agents across Texas reached over 20,000 providers with

research-based newsletters and self-study programs that address critical issues related to the care of 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. County Extension agents, in collaboration with local partners, led multi-session parent education workshops, 1-2 hour training seminars, and disseminated a wide variety of parenting information via fact sheets and newsletter articles. Topics include fathering, teen parenting, grandparents raising grandchildren, teasing & bullying prevention, discipline, early childhood education, self-esteem, early brain development, and nutrition for infants, toddlers, and school-age children. In addition to agent delivered programs, resources are made available to parents and professionals on the Family and Consumer Sciences website.

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

Parenting Education Contacts	
Individuals attending parenting classes/programs	31,832
Individual contacts (e.g., phone, e-mail, office)	38,122
Contacts via newsletters & self-study guides	35,702
Volunteers trained in parenting programs	1,184
Individual contacts by volunteers	8,618
Parents attending volunteer led parenting programs	19,846
Total Contacts	135,304

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 (20 Texas counties). Over 800 fathers, grandfathers, and male mentors (and over 1,000 children) from 20 Texas counties participated in the *Fathers Reading Every Day* (FRED) program in 2004. Over 500 fathers completed all aspects of the four-week program with their children. Results from the program in 2004 revealed significant improvement in a number of 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. Highlights from an evaluation study conducted with 228 FRED participants in Montgomery County include:

- 60.5% reported that FRED “Increased the time I spent with my child.”
- 56.1% reported that FRED “Improved the quality of the time I spent with my child.”
- 60.5% reported that FRED “Helped me become more involved in my child’s education.”
- 56.6% reported that FRED “Led to improvements in my child’s vocabulary.”
- 53.9% reported that FRED “Helped my child learn to read.”
- 52.2% reported that FRED “Increased my satisfaction level as a parent.”
- 53.9% 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. A few representative quotes are listed below:

As a result of participating in the FRED program, “my child feels more confident reading out loud.”

“I am close to my son. I am very involved in his discipline, morals, time with him, but I have always let my wife deal with reading and homework (she has an education). I see how just reading a book has really given me a part in my children’s education too.”

I liked FRED because “it was a set reminder to read every day and helped me realize the importance of me reading to my children.”

The FRED program “challenged me to be more involved. It provided us with time alone, during which we grew closer together through reading a variety of stories/books that allowed us both to travel, explore, and go on adventures that expanded his vocabulary, imagination and horizons.”

Parenting Along the Border (El Paso County). Seventy-one parents from El Paso County participated in multi-session parent education classes in 2004. An analysis of completed pre- and post-test surveys revealed that the parenting classes had a very positive effect on specific parenting practices. Paired t-tests indicated significant improvement from pre to post in a number of parenting behaviors, particularly in the areas of parent-child communication, parental self-efficacy, parental involvement in their children's education, positive disciplinary practices used by parents, and parental encouragement to engage in increased physical activity as a family

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

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)
- Were more likely to include physical activities as part of their family time

2004 Building Strong Families Conference (Lubbock). 751 parents participated in the 9th Annual 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 extremely helpful to participants. Evaluation data from the follow-up will be available in early 2005. Participants at the conference came from very diverse backgrounds, including over 50% Hispanic/Latino.

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. Nationally, youth related issues include Weight Management, Harmful Substance Abuse, Teen Sexuality, Accepting and Respecting Others, Youth Violence, Unsupervised Time, Youth Literacy, and Death by Accident. During 2004, Texas Counties identified a number of youth related issues which strongly parallel national concerns.

Texas 4-H offers nine areas of program delivery to meet the needs of a diverse state with complex issues. 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 2004, 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

Texas Cooperative Extension

Texans Building Character was initially brought forward through special initiative funding. Character Education was identified by Texas residents, during the Texas Community Futures Forum, as a high priority of need for Texas children and parallels the national concern of accepting and respecting others and concern for youth violence. During 2004, 153,526 youth participated in Character Education project work. Distinguishable results from around Texas include the following.

As a result of Texans Building Character intervention in Mills County, Booker and Follett teachers observed students practicing and demonstrating acts of true character at school with greater frequency. With the six pillars as a foundation, students were equipped with the knowledge, motivation, and skills to exhibit (and continue practicing) true character, not only in the schools, but in the home and community, and into adulthood. Members of the Gonzales Youth Center were invited to take part in the Texans Building Character Series. Youth learned what it means to be responsible. They learned to not lie, cheat, steal, or show disrespect. During

past Extension efforts, Dickens County reported that 90% of their school aged participants indicated an increased appreciation for respectful behavior

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 reoffended 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). Past highlights from Tyler County indicate the only 12 % of the program participants were repeat offenders as compared to the state average of 50%. Encouragingly, the Tyler program also resulted in a 50% school attendance increase for program participants. A 2004 highlight from Tyler includes a workshop on the health, economic and legal aspects of using tobacco products. Guest speaker from Texas Workforce Solutions taught a workshop on job skills. Guest speaker from the Tyler County Sheriff’s office taught a workshop on drug prevention.

During 2004, Extension completed a five year partnership grant focused toward entrepreneurship and job readiness. Recently, 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. During 2004, a partnership grant was submitted to continue this important effort for the next five years.

During 2004, a grant was secured focused toward building a climate of inclusivity in communities. The program includes seven county sites who are focused toward teaching community groups to be more accepting and inviting to youth with disabilities. Texas 4-H also created a state wide Technology team who will partner with state faculty to offer more educational opportunities for youth via the web and distance learning.

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 2004, Texas Cooperative Extension completed the three year phase in of all Extension program volunteer working directly with youth. The program continues to qualify new volunteers. To date over 10,000 volunteers have been screened. All criminal background checks are completed through the Volunteer Center of North Texas.

Clothing Master Volunteer. In 2004, over 20 counties continued involvement in MCV training. Rather than a three day training as in the past, statewide efforts were focused on a one day training in utilizing waste textiles in re-fabrication projects. An online Master Sewing Volunteer Training course was developed with one module piloted during the year. 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(15) give direction to the youth project work conducted in Texas. Project teams consist of youth and adult volunteers, corporate 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.

Urban Plant Detectives The goal of this new and innovative program is to train Master Gardeners to successfully execute and perform simple applied research demonstrations. This program aims to educate the participant in scientific design and methodology and to provide an opportunity to experience the benefits, challenges and joys of performing a research demonstration. Plant detectives are trained for 10-15 hours in basic knowledge of the research subject matter, data collection, mid duration follow up and review and a final debriefing at the end of the project. All data is collected and analyzed statistically. Participants are shown how to interpret the results. The local county Extension agent works with the “detective” to write the research demonstration report and contribute it to the goldmine system. Impact and outcome data of this program will be available in 2005.

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 256 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 extend that knowledge to other producers and may provide leadership for marketing clubs in their home counties. Six hundred and thirty producers have now graduated from the Master Marketer Program through 2003.

A. *Impact of Programs*

Youth Protection Standards. All TCE employees are receiving training in the area of volunteer qualifications, child abuse prevention, and risk management. Clientele have received this program 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 has shown that sewing stimulates creative expression and self esteem for kids. 4-Her’s develop required skills, patience and learn to make something by hand that carries a great meaning when made and given away. In addition, youth learn to teach sewing skills to others. In 2004, this team sponsored 4-H Hope Totes. Members sewed 3,418 tote bags and filled the totes with toiletries, books, crayons and other needed items. Totes were given to shelters, children’s

homes, nursing homes and to adults in need. The value of youth volunteer contributions is over \$17,000.

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 2004, 19 Master Volunteers and 217 project volunteers gave over 7900 hours to this project area valued at over \$150,000.

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 2004, 14 master volunteers and 32 volunteers gave over 1400 hours to this project valued at over \$24,478.

Texas 4-H Livestock Master Volunteers. A total of 102 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.

Texas 4-H Master Sheep/Goat Volunteers have provided over 1,600 hours to the program and reached over 5,000 people. Their payback hours included such activities as project supervision, validation committees, livestock show boards, educational programs, project selection, facility upkeep, showmanship clinics, assisting new families, judging project shows and providing school programs.

Junior Master Gardener. Data supporting this project include:

- *JMG Website reaches an average of 28,000 user sessions per month
- *JMG National Electronic newsletter averages – 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 -- 2004 was the 6th year of this partnership.

This award winning program has trained over 2,400 adult volunteers in 30 local chapters since its inception. In turn, these volunteers have committed over 87,000 hours of service for natural resources outreach and local community projects. In 2004, through this program over 150,000 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.

These ten significant volunteer efforts showed a contribution of \$9.4 million in services performed by volunteers.

Output Indicators

Texas Cooperative Extension - 2004 Volunteer Development	
96,357	Volunteers Trained
3,197,975	Individual Contacts by Volunteers
1,506,568	Attendance at Group Methods Conducted by Volunteers
\$301,460,583 million	Value of Volunteer Time

Source: Bureau of Labor Statistics, Independent Sector, 2003 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 10,000 volunteers to date. These individuals are involved in all Extension disciplines and programs in a direct volunteer role. A 6 % red flag rate has occurred as a result of the criminal background checks. This is consistent with the state average for red flags regarding volunteer background checks.

Master Clothing Volunteers. In its 12th year, the program continues to attract volunteer interest both in and out of Texas. Within 20 Texas counties implementing the MCV program 2004, 409 group trainings were held. These individuals have made over

6,273 contacts while repaying their 50 volunteer hours. MCV's conducted 574 group meetings reaching 13,588 volunteers through group and individual sessions.

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 Tech Team is a new 4-H and youth project team. The goal of this group is to create and promote a diversity of youth program opportunities. In addition the make up of this volunteer driven team is one of collaboration among the military, corporate executives and University of Texas at San Antonio. Early involvement has created several volunteer advantages including HP computers being donated to the Texas 4-H Center and statewide marketing through the revamping of the Texas 4-H web site.

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 and goat master volunteers revealed a significant increase in their subject matter knowledge of the industry, their ability to carry out leadership responsibilities, and in their ability to effectively plan 4-H swine project activities.

4-H Record Book Master Volunteers. Nineteen active 4-H Record Book Master Volunteers trained and assisted 207 4-H Volunteers in record keeping and 4-H Record Books. These volunteers taught 368 4-H members about record books. In addition to Master Volunteers and Volunteers trained by Master Volunteers, another 92 volunteers were trained in record keeping and assisted 368 4-H members with record keeping skills.

4-H Method Demonstration Volunteers. Fourteen active 4-H Method Demonstration Master Volunteers trained and assisted 32 4-H Volunteers in the field of method demonstrations. These volunteers taught 156 4-H members about method demonstration or illustrated talks. Those 4-H members participated on the district level or higher with their demonstrations. The 4-H Method Demonstration Master Volunteers contributed 560 hours of service that has a monetary value of \$9,626.40. The other 32 volunteers that taught lessons and assisted youth in preparing method demonstration, as a result of the Master Volunteer's assistance, contributed 864 hours of service with a monetary value of \$14,852.16. An additional 105 volunteers, who were not trained by Master Volunteers or did not participate in the Master Volunteer Programs, also contributed 2,412 hours of service having a monetary value of \$41,462.28.

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. In 2004 19,760 acres of Texas habitat were impacted through land management activities and practices by volunteers. Additional impacts include 50 miles of NEW interpretive trails, over \$120,000 secured for local chapter projects and educational efforts, and chapters were recognized with 14 local, state, national and international awards and recognition. 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.

“Since attending the program, we have achieved a much higher price for each commodity... We have been able to lock in cost of production while benefiting from upside potential through the use of cash, futures, options and basis management.” Glen Rod, El Campo, Texas.

“...using the knowledge of price protection through hedging opportunities in our operations, I've been able to increase our profits by an average of \$70,000 a year over a six-year period.” Dale Hughes, Vernon, Texas.

“Because of the Master Marketer Program, I now look at the market every day and not just when I have a crop in the bin to sell.” Bob Thorton, East Bernard, Texas.

“I am no longer 'reacting' to the market's ups and downs but 'acting' in a controlled manner based upon market signals at the time, while using the proper tools to accomplish my goals.” Keith and Michele Orsak, Edna, Texas.

"Overall, I anticipate the skills developed in the Master Marketer Program to increase my profit by 25 percent." Leo Holloway, Abilene, Texas.

"The Master Marketer class gave us the confidence to take advantage of marketing opportunities as they occur. In one particular year, we were able to increase our farm income from grain sorghum by \$10,000 by the use of put options." Brian and Natalie Borchardt, Tulia, Texas.

Texas 4-H Clothing and Textiles Project: *Lorina sewed on Saturday and nearly finished the shirt to her outfit. I was so proud of her as she showed patience I have not ever known her to have. She did very well." Mother of 9 year old member*

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 12, Volunteer Development.

C. Sources of TCE-TAES Federal Funding

TCE: Smith-Lever and State Matching

TAES: None

D. 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 2004, Texas Cooperative Extension conducted many successful educational programs which were expanded via partnerships and collaborations. Historically, these partnerships and collaborations have been with citizen groups, other universities, other agencies and key stakeholders. The Texas Community Futures Forums were conducted in all 254 counties with key input from many of these partners.

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.

288,226 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.

41,071 Number of Participants Served by Group Methods

 5,783 Number of participants Served by Group Methods in a Team Role

135,714 Number of Participants Served by Individual Methods

 3,492 Number of Volunteers Trained

102,166 Number of Contacts by Volunteers

Linkages were made with numerous organizations including Volunteer Leader Organization of Texas, National Guard, Texas Education Agency, U. S. Department of Energy, Coalition of Valley Families, Texas Department of Transportation, Child Protective Services, Boys and Girls Clubs, YMCA, Junior Achievement, Texas Home Buyers, Chamber of Commerce, Farm Bureau, Habit for Humanities, Food Bank, Promotoras Collaboration, Fort Hood, 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, Communities in School, American Cancer Council, U. S. Fish and Wildlife Services, 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:

Passenger Safety. The Passenger Safety Project (PS) 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 PS to conduct child safety seat checkup events and NHTSA certification trainings, whereby individuals become nationally certified as child passenger safety technicians and instructors. Three, 32-Hour NHTSA Child Passenger Safety Technician Certification Trainings have been conducted and 64 technician candidates have been trained.

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. In 2004, 871 child safety seats have been checked and 640 child safety seats distributed at no cost to parents/caregivers.

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 State Health Services (TDSHS); 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. The project distributed 19,188 resources and incentive items to support occupant protection. The project's two Rollover Convincers were viewed by over 157,450 participants.

Texas Cooperative Military Programs. Texas Cooperative and the U.S. military have worked hand-in-hand to meet the needs of Texas families since 1987. The following are highlights of this partnership:

Family Advocacy Program - employs Extension agents at both Fort Bliss and Fort Hood.

Army Substance Abuse Program - uses Extension agents to provide educational programming to make soldiers and family members aware of the consequences of drug and alcohol abuse.

Financial Readiness - Extension agents trained more than 70 Command Financial Specialist, who were able to reach over 80,000 individuals.

Exceptional Family Member Program - provides services to enhance the quality of life for special needs individuals and their families.

Mobilization and Deployment - Extension agents provide extensive training to rear detachment personnel, family readiness groups, soldiers, and installation support personnel. *Operation READY* is a vital part of this effort.

Information and Referral - Extension staff assistants are employed at both Fort Bliss and Fort Hood to provide vital single point-of-contact service to the military community.

Employment Readiness Program - provides educational programming and information that can assist participants in finding employment in the community.

Operation Military Kids - On-going 4-H clubs exist on six military bases in Texas with more than 6,000 members. "Purple Camp" or Texas 4-H Military 4-H Stars and Stripes Camp was held with 42 youth of deployed soldiers from all branches of service. Also, a state-side military conference was held with 32 participants representing Army, Air Force and Extension. Speak Out Military Kids Leadership workshop/lock-in was conducted to promote successful joint programming with County Extension Offices and Military Installations.

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. Over 600 fathers, grandfathers, and male mentors and nearly 700 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 9.2 hours reading with their children and averaged 39.6 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 2004, 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.

4-H After School - 4-H after school clubs were started in 16 counties involving more than 1800 youth. Partnership efforts were with Junior Achievement, YMCA, Boys and Girls Clubs and JC Penney. Private sector grants totaled more than \$40,000. Teams of volunteers, after school providers, Extension agents and Extension specialist were trained in Extension district 3, 9 and 11. A 180 educational curriculum was designed and introduced called “Yeah 4-H”. Regional trainings were held to implement this curriculum.

Texas Rural Development Council. Partnerships 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 63 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 1000 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 48 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 produced and training for agents and property owner/managers scheduled..

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 has also produced an update of the nationally recognized and utilized "Building Better Rural Places"

publication which has been disseminated nationally in print and compact disk versions. Texas provided planning leadership for, and hosted, a national “Small Business Skills Training” workshop in which approximately 50 Extension faculty from throughout the country acquired information and materials supporting delivery of quality educational programs in this area. 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 complete and a statewide training focusing on this often neglected aspect of community entrepreneurship will be conducted early in FY05. Incorporation of information technologies in the entrepreneurial programming effort has yielded Texas Main Street Online, an e-commerce educational program which has resulted in at least one participant establishing an on-line presence which has precipitated expansion of taxable sales and numbers of employees. Planning is underway to support a statewide summit focusing on entrepreneurship with an agricultural and rural area focus.

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. Considerable subsequent involvement of local k-12 and higher education institutions and employers is resulting in a high level, focused effort on workforce development.

A regional pilot project of an agribusiness incubator and accelerator is in the process of graduating the first firm from its main facility and has attained 100% occupancy of a satellite facility in another county of the Texas Panhandle region.

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 2004, all counties in Texas participated in an effort to implement the second formal TCFF process. All 254 counties conducted a grassroots process to identify issues at the local level. In addition, a state-wide electronic survey was implemented as an additional option for local citizens to identify issues. Approximately 6,400 citizens participated in the forums and raised over 2,200 issues.

In the summer of 2004, faculty from TCE came together to study issues from the TCFF process as well as issues raised by other stakeholder groups. To accomplish this 12 regional data summits were held across the state. The purpose of these summits was to understand issues facing our state and develop action plans to address issues of importance. Over 110 action plans were developed during and since the summits. These action plans were used extensively by agents and specialists for the purpose of local, regional, and statewide program planning.

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.

Another indicator of stakeholder involvement is customer satisfaction. Customer satisfaction results are obtained from 48 randomly selected counties representing the entire state. In these counties, educators administer a standardized evaluation instrument to participants in group educational activities. Data is entered and analyzed at the state level.

Five specific indicators are calculated and reported for customer satisfaction. First, a customer satisfaction index (CSI), is comprised of seven questions that ask participants to disagree or agree with statements about the relevance, timeliness, accuracy, understandability, and helpfulness of the information provided. Using a scale of 1 (strongly disagree) to 5 (strongly agree), ratings are summed and averaged to create a score. Overall, the CSI for FY 2004 was 4.42 or at the 88th percentile. The second indicator is a single question about the overall value of the information and programs provided by Extension. The 1-to-5 rating for this question ranges from not at all valuable to very valuable. The overall value score is 4.55 or the 91st percentile. The next two indicators are referrals to others and intent to adopt practices. Referral to others relates to whether a participant would recommend an educational opportunity to others. Overall, given a yes/no choice, 97 percent of participants in FY 2004 would recommend the programs they attended to others. Participants also are asked if they plan to make any changes based on the information they received. Given a yes/no choice, 68 percent of

participants statewide plan to make changes based on the information received. The final customer satisfaction indicator is an instructor index, which will be introduced in 2005. The index will reflect participant perceptions of the instructor's knowledge, preparedness, presentation skills, and responsiveness to questions.

Finally, Extension Program Councils continue to serve as a conduit to local citizens and their needs. Currently, over 13,000 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 2004. 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.

A special effort was implemented in 2003 and continued referred to as the Texas Beef Industry Round Table. Four regional meetings and a state wide meeting were conducted to determine industry needs, establish priorities, and provide an action plan for TAES and TCE.

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. A concentrated effort was done for small grains, corn, sorghum, and cotton resulting in a jointly developed strategic plan.

C. PROGRAM REVIEW PROCESS

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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.

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

D. EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

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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 and 2005-2008. These plans for 2000-2004 and 2005-2008 are based upon issues identified by stakeholders and citizens during the Texas Community Futures Forum held in 1999 and 2004. 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 2004 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

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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 including 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. 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 2004:

RRF Project No.	TITLE	States
NRSP-3	The National Atmospheric Deposition Program (9/08)	CA, CO, FL, GA, IL, IN, KY, LA, MN, MD, MA, MI, NE, NY, OH, OR, PA, TX, UT, VA
NRSP-6	Inter-Regional Potato Introduction (9/05)	NY, TX
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
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-503	Host Plant Control Resistance to & Best Management Practices for Karnal Bunt of Wheat	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) <i>Replaced NC-208; H-7084</i>	AZ, AL, CA, GA, IL, ID, IA, IN, MD, MI, MO, ND, NJ, NE, NYC, OH, TX, WI, VA

RRF Project No.	TITLE	States
NC-1004	Genetic & Functional Genomic Approaches to Improve Production & Quality of Pork (9/07) <i>Replaced NC-210</i>	AL, IA, IL, IN, MI, MN, NC, NE, OH, OK, TN, TX
NC-1010	Interpreting Cattle Genomic Data: Biology, Applications Outreach (9/07) <i>Replaced NC-209</i>	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) <i>Replaced NC-208</i>	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) <i>Replaced NC-167</i>	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	CTS, KY, MD, ME, MI, MN, NYC, PA, TX, UT, WI
NE-1011	Rural Communities, Rural Labor Markets & Public Policy (<i>Replaces NE-162</i>) 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 (<i>Replaces NE-60, NE-temp361</i>) 9/08	AR, CA, DE, IA, NC, SC, TX, NH
S-009 - -	Plant Genetic Resource Conservation and Utilization	AL, AR, FL, GA, HI, KY, LA, MS, NC, OK, PR, SC, TN, TX, VA, GU
S-065	Multistate Research Coordination, Southern Region	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)	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 <i>replaced S-145</i>	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

RRF Project No.	TITLE	States
S-291	Systems for Controlling Air Pollutant Emissions and Indoor Environments of Poultry, Swine & Dairy Facilities <i>replaces S-261</i>	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	AL, AR, FL, GA, NC, SC, TX, TN
S-293	Improved Pecan Insect & Mite Pest Management Systems	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) <i>Approved CRIS 3/19/02</i>	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
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

RRF Project No.	TITLE	States
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 (06)	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
S-1015	Host Resistance as the Cornerstone for Managing Plant-Parasite Nematodes in Sustainable Agro Ecosystems (S-782)	AL, AR, LA, MN, MS, NC, SC, TN, TX, ARS
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	AZ, CA, CO, HI, ID, NE, NV, ND, OR, TX, WA, KS, UT, NM
W-195	Water Quality Issues in Poultry Production & Processing (9/05)	AL, AR, CA, DE, GA, KS, LA, MD, MI, MN, MS, NC, OR, OPA, 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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