FY 2005 Annual Report of Accomplishments and Results: Oklahoma Cooperative Extension Service

A. Planned Programs

Preamble

During the reporting period, the Oklahoma Cooperative Extension Service (OCES) was able to restore filed staff to pre 2003 levels. This occurred due to significant increase in State funding targeted at field (county and area) programs. However, because many of the restored positions were filled by new educators through the year, the scope and breadth of total programming was completed realized during this period. However, the numbers of activities and public participation did go up markedly from FY2004 and we expect the affect of this restoration to continue to have an impact in FY2006. OCES personnel performed admirably and provided extensive science-based education, information, and technical transfer to a very large percentage of our target audiences.

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

Overview

Oklahoma key program components contributing to this goal included: improving efficiency in livestock production, improving efficiency in crop production, forage production, improving domestic marketing concepts and alternatives, sensor-based technologies, animal health, commercial horticulture and alternative agriculture opportunities, farm safety, turf production, climate and weather, cattle receiving and feeding, biosecurity and animal disease, natural resource management, small farm viability, risk management, value-added food and agriculture products, home lawn and gardening, and food safety related to production. This goal constitutes a very significant proportion of the OCES effort. Approximately 4,620 demonstrations, meetings and conferences were conducted during the year. OCES personnel in agriculture-related programs conducted an additional, 37,471 visits and consultations. These activities were attended by 549,030 participants during the year. In addition, 10.1% of these participants were identified as representing non-white, minority populations as compared to 6.7% of the state's farms operated by individuals representing these populations.

Wheat is the crop with the highest gross receipts in Oklahoma. Over 6.2 million acres are planted. The largest purchased input for wheat farmers is usually nitrogen (N) fertilizer. Costs vary, but are about $24+ per acre. An average of 65% of the applied fertilizer is lost by volatilization and leaching, equivalent to about $16/acre per year. As a result of applying the N during the season, instead of preplant, the nitrogen use efficiency is improved, leading to decreased loss of N to the environment and improved profitability. The net economic benefit from in-season estimates of yield and topdressing all fertilizer N for grain production is estimated at $17/acre/year for the 31 years of data from the Lahoma research trial. A new program (in its second year) to take advantage of the sensor-based technologies developed through the Oklahoma Agricultural Experiment Station. Studies have shown that through use of hand-held sensors and Nitrogen-rich

strips producers can more accurately estimate N needs – resulting in an average savings of approximately $15 per acre. Over the last two years, training was conducted for 24 county agricultural educators, seven area specialists, eleven dealers/consultants, and 29 pilot producers. Each county educator and area specialist was supplied with a hand-held sensor for use in demonstration projects. These have served as the pilot program for a broader use of this technology. Over 800,000 acres were involved in the first two years of the pilot. We expect an increase in the program for FY2006. Many of the producers showed savings in excess of those estimated from research.

The second highest cost to producing wheat is the application of pesticides and losses resultant from weed species in wheat stands. OCES, in conjunction with the Oklahoma Agricultural Experiment Station, has begun a pilot project to introduce winter tolerant Canola as a rotation crop with winter wheat in western Oklahoma. Canola grows much like wheat and is planted and harvested with the same equipment. Development of new varieties of winter Canola and management of the crop is part of a new multi-state project between OCES, Oklahoma Agricultural Experiment Station and the Kansas Agricultural Experiment Station. Demonstrations and conferences in Oklahoma in 2005 drew over 1,000 producers from Oklahoma and Kansas. Production has grown from 60 acres for the 2004 crop to 13,000 planted in 2005 for the 2006 crop. Studies are being completed to estimate the changes in costs of herbicides and losses in wheat and the affect on grazing.

Two other programs highlighted this year affected wheat producers' economic returns. Successful weed management systems developed for control of cheat and wild oat in wheat have been developed and tested in Oklahoma. In order to help producers accurately identify each grass, a full-color identification brochure was developed along with a Fact Sheet on the costs of dockage discounts for the presence of cheat and/or wild oat seed in harvested wheat. A special effort was made through demonstrations, conferences, and county mailings to distribute approximately 10,000 of these producer-oriented publications. Follow-up surveys will be done to determine the application level and magnitude of impact. However, proper identification and proper spraying could result in a combined spray and dockage savings to producer between $1.5 and $2.0 million. Finally, a set of producer facts and an accompanying 10-hour workshop for producers was developed. Research ahs shown that 67% of Oklahoma wheat is sold below market average. It is the goal of this program to increase one-fourth of the wheat sold below average by twenty cents per bushel. This could result in an increase in producer income of $2.4 million.

Beef cattle production and management continues as one of the most significant major program areas. Cattle production comprises about 55% of the $4.5 billion in cash receipts earned by Oklahoma producers. These programs included quality marketing, reproduction, cow-calf production, quality practices, marketing tools, beef production during drought, stocker production, feeding decisions, cattle pricing, and nutrition. The Oklahoma Master Cattleman Program is designed to enhance the biological and economic efficiency, as well as enhance the quality of life of beef cattle producers through comprehensive and consistent educational curriculum delivered locally. Directed at primarily small to moderate-sized cattle producers, over 270 educational programs were conducted in FY2005 resulting in 9,692 person-hours of instruction delivered. Currently, 620 producers are enrolled in Master Cattleman courses and 78 producers graduated in FY2005.

Several other continuing programs have been highlighted in previous annual reports. These include: the Oklahoma Quality Beef Network (OQBN) program designed to take advantage of items learned from the 1995 and 2000 Beef Quality Audits – over 21,000 head of cattle from 305 cattle operations were certified in the first four years of the program. Cattle buyers paid an average of $5.01 more per cwt for certified cattle. The higher price coupled with better gain due to preconditioning resulted in a gross increase in revenue of $88 per head and an average increase in net income (after all documented costs) of $24 per head. This is over $500,000 increased net income from these sales alone. In addition, many of the producers are using the same methods on all their cattle and thus able to get premiums on those as well. Pre OQBN survey indicated that 75% of the participants did not precondition prior to the program.

Forage and hay are extremely important to the state's cattle production. Quality improvement and testing programs assist producers generate high quality, safe and low cost hay. A pre-testing program for toxic nitrate levels in forage helped producers avoid a potential $11.3 million dollars of loss in eight counties alone in FY05. This program is available in most counties with similar results.

During FY2005, there was a growing emphasis on research, demonstration and educational programs related to minimum and no-till production of crops across the state. One example concerns cotton production in the southwest portion of Oklahoma. Tillage and cropping demonstrations/studies have been used to inform over 250 dryland cotton producers in the area of the potential of these rotation and tillage combinations. Early returns indicate the producers implementing these techniques have increased net returns at and average of $44 per acre. Multi-year data will be needed on some of the rotations to get an accurate picture of the impact. However, with 200,000 acres of dryland cotton production in one county alone, the potential impact is considerable.

Means to improve rural incomes through value-added, biobased product production has become a very high visibility set of programs for OCES and OAES. The rapidly emerging biofuels markets provide potential to add value to Oklahoma feed grains and increase the returns to farmers. OCES has assisted with several projects as they get planning and development grants and plan the potential operations. One project worked on this year involves producers and an energy industry partner. The project will use 19.7 million bushels of corn and sorghum to produce fuel grade ethanol, distillers grain and CO2 gas. Economic impact of the plant during construction phase and the first three years of operation is projected to be over $200M.

In other programs, the Oklahoma Food and Agricultural Products Center continues to assist a broad array of food and related products manufacturers in the state. These vary from startup businesses to very large manufacturers. Product design, manufacturing efficiency and food safety are among the primary outreach efforts. Three new-generation cooperative feasibility studies were supported by the center during the reporting period. Animal health, food safety and biosecurity have continued to grow in programming emphasis. The Plant Disease & Insect Diagnostic Lab (PDIDL) of the Department of Entomology & Plant Pathology at Oklahoma State University has been providing expert identification and diagnosis of crop pests to growers for many years. During 2004 the focus of the PDIDL at Oklahoma State University was on upgrading equipment

to assist with diagnosis of entomological problems, on implementing PDIS, on converting pathogen detection protocols using polymerase chain reaction (PCR) methods to real time PCR, on beginning to set up a biosecure lab, and on training extension educators, crop advisors, and master gardeners to recognize the major pest threats to crop security. As of FY2005, these upgrades have been completed and are on-line. In addition, First Responder training has been completed for County Agricultural Educators.

Positive progress was made in all Key Program Components listed under this goal in the Oklahoma Cooperative Extension Service 5-year plan of work. Total expenditures represented by programming and related support for this goal are approximately $10.1 million with $1.8 million from Smith Lever funds. About 91 professional and paraprofessional FTEs contributed to the goal last year. Following are some example program impact statements arranged by CSREES Key Theme.

Impact Statement Goal 1

Key Theme – Adding Value to New and Old Agriculture Products

Title: Value Added Efforts within the Oklahoma Food and Agricultural Products Research and Technology Center

Issue:
The Oklahoma Food and Agricultural Products Research and Technology Center (FAPC) is a value-added food processing facility having faculty and professional staff representing essentially all food and fiber production and processing disciplines in Oklahoma. The FAPC Coordinating Project ensures control and accountability of all human and facilities investment into the FAPC for economic development in Oklahoma**.**

What Has Been Done:
The food industry and agribusiness sectors have been serviced, totaling over 1,000 client projects, with attention given to food safety and microbiology, horticultural products processing, food process engineering, regulatory and compliance technology and training, oilseed products and processing, small grain products and processing, meat and poultry products and processing, food and ingredients processing, food preference and sensory science, economic and rural development, business planning and market development for food companies of all sizes in Oklahoma, and entrepreneurial business development in Oklahoma. Significant progress has been made in identification of strategies for the reduction of pathogens entering the food stream via meat animal carcasses and through ready-to-eat meat and poultry products. Significant progress continues in the characterization of the process and neturaceutical quality of lycopene obtained from watermelons. Significant progress has been made in the characterization of potential of harvested and field processed and fermented sweet sorghum for fuel ethanol production. Significant progress has been made in a turnkey project for the conversion of the total food manufacturing waste stream in commercial food plants in Oklahoma to a energy resource for those plants. Significant progress has been made in food safety/HACCP training, small business start-up training, real-world marketing training, clean-in-place food systems training and best

practices in quality control training. Finally, significant progress continues in the manufacture of commercially accepted wood composites from underutilized species in Oklahoma.

Impact:
The FAPC has successfully helped launch over 130 start-up businesses, has had significant impact on over 22,000 direct and indirect food processing jobs in Oklahoma and significant impact on over $2 billion in direct and indirect food processing revenue in Oklahoma. The FAPC has contributed to a 69% increase in employment and over 40% increase in sales revenue in those companies assisted in Oklahoma. The FAPC has been the product development resource for the successful launch of a nationally marketed set of processed meat and sausage products. The FAPC has been the product development and manufacturing site resource for the successfully Oklahoma marketed grape juice beverage product.

Scope of Impact: The emphasis of work at the FAPC is economic development in Oklahoma.

Source of Funding: State funds, grant funds

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Key Theme – Agricultural Profitability

Title: OK Steer Feedout

Issue:
Information transfer between different segments of the beef industry is becoming much more commonplace and potentially more valuable. Beef cattle producers that can document improved post-weaning performance of their calves can potentially capture the added value at marketing. Key performance information would include, feedlot average daily gain, weaned calf health performance, carcass quality grade, carcass yield grade and carcass value premiums. As beef producers utilize improved genetics in their herd, they often desire to verify superior calf crop performance. Without verification, the added calf value potential can often go un-captured. The OK Steer Feedout is a vehicle that allows cow-calf producers, with small or large herds, to evaluate the performance of a sampling of their weaned calves and help assess the potential increased value due to feedlot performance or carcass merit.

What Has Been Done:
The OK Steer Feedout is an information feedback program for cow-calf producers that desire to learn more about the post-weaning performance of their calf crop. Objectives of the program

include; 1) Data collection and reporting on the steers entered. 2) Assist producers with genetic change or improvement. 3) Benchmark the health status of calves produced. 4) Educate beef producers on the feedlot and meat industry, with emphasis on traits that add value.

The OK Steer Feedout was started in 1984 and has fed over 4900 steers representing over 40 different beef breeds and breed crosses. Over 333 ranches, many of which are multiple year consigners, from Oklahoma, Texas, Kansas, Missouri, Colorado, and Nebraska have utilized the program. The OK Steer Feedout consists of a fall born and spring born test with a 150 to 180 day feeding period followed by harvest in a commercial beef plant. To participate, ranchers deliver weaned steers, grouped in multiples of five head, to the host feedlot. The steers are processed, tagged and fed until harvest. The OK Steer Feedout committee oversees the feeding period, data collection, steer harvest, financial rectification and final data report. A booklet is produced with a comprehensive summary of each steer the producer entered and summary information from the current Feedout test. Educational programming is conducted in conjunction with the OK Steer Feedout.

Impact:
The fall born and spring born 2004-2005 OK Steer Feedout tested 150 steers from 10 beef breeds representing 23 Oklahoma and Kansas ranches. The gross revenue of the carcasses marketed on a premium grid program through the Feedout was $156,432.72 for an average of $1056.98 per head. A quality grade premium was paid on 35 carcasses and averaged $11.05 per head. A yield grade premium was paid on 105 carcasses and averaged $23.51 per head. The total of grid premiums paid was $2855.63. Grid discounts are also identified to assist producers with cow culling or bull selection changes or both. The 2004-2005 Feedout included four carcasses with a quality grade discount and one carcass with a yield grade discount. The average calculated per-head profit for steers fed in the Feedout was $19.40, and ranged from a high of $176.89 to a low of -$269.37.

An educational program is held annually to review the current Feedout data and help producers apply the OK Steer Feedout information to their ranch. Over 60% of the ranches attended the 2005 wrap-up program, in addition to other interested beef producers. We distributed over 300 Feedout summary booklets to participating ranches, extension educators, breed associations and interested producers. Participating producers were given a digital photo of their steers before and after feeding, plus the digital image of the carcass rib eye cross-section.
Many purebred producers use the OK Steer Feedout to gain information for evaluating young sires. Other producers feed steer groups in consecutive years to measure genetic progress. In the 2004-2005 Feedout one purebred producer tested the progeny of two herd bulls that he is utilizing. He entered one pen of 5 steers from one sire and one pen from the second sire. The first pen had a higher feedlot average daily gain and therefore the pen was ready for market earlier than the second. These 5 steers had an average harvest weight over 40 pounds heavier with 21 fewer days on feed. The first pen had one USDA Choice quality grade and 4 USDA Select grade carcasses. The Select price per hundredweight was $5.00 less than for Choice. When the second pen was harvested, all 5 steer were USDA Choice with one receiving a additional $2.00/cwt premium for carcass quality grade. A premium for attaining USDA Yield Grade 2 was given to 4 of 5 in the second pen as well. In summary, the second pen had an increased value when marketed through a carcass grid program while the first pen produced more sale weight more rapidly and steers would have a greater value selling on a live weight basis. Given the 2004 market level, with the price

difference between USDA Choice & Select small ($5.00/cwt vs $9-12.00 average), the first pen made more money than the second which emphasizes the fact that, in the current market price structure, pounds of sale weight is still a larger factor in determining profit than increasing carcass sale price per hundredweight with carcass premiums. Through data obtained in the OK Steer Feedout, this producer discovered the feedlot and carcass value differences in the sires he was utilizing to produce herd bulls. The bulls that he produces and offers for sale can serve a variety of different production and marketing goals for his customers. Those that want to increase average daily gain/sale weight and those that are utilizing grid marketing can both utilize this producer's OK Steer Feedout information to make knowledgeable bull buying decisions and therefore add value to their calf crop. By knowing the value attributes of their bull purchases and matching that information to their own cow herd, commercial producers can manage their calves and put a marketing plan in place that will allow them to gain added value and maximize ranch income.

A bus tour was held in 2005 in conjunction with the Feedout. The 48 producer's rode a chartered bus to Dodge City, Kansas and toured the Excel beef processing facility including both steer harvest and carcass fabrication. Seeing first-hand and gaining information about the beef processing business was a first many of the producers that participated. Other tour stops included the Gardiner Angus Ranch and Ford County Feeders. An educational field day was held in 2004 in conjunction with the Feedout. We had 105 producers and extension educators attend the educational program on carcass value, animal identification, and a fed steer evaluation demonstration.

Scope of Impact: State Specific, some individual producer participation from neighboring states

Funding: State, Smith-Lever Act

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Title: Timely Marketing of Wheat Increases Producer Profits.

Issue:
Research has shown that about 67 percent of the wheat sold in Oklahoma is sold at a below average price. Thus, producers need to change how they sell about one-third of the wheat produced in Oklahoma. Research also shows that Oklahoma wheat should be sold between 60 days prior to harvest and December 1 after harvest. The research also shows that timing of sales is more important than the marketing tools used to establish the net wheat price received.

What Has Been Done:

A series of Oklahoma Cooperative Extension Fact Sheets (F-589, F-590, F-591, F-592, and F-593) were written and a 10-hour marketing workshop was developed. The facts sheets included cooperative research that was conducted at Oklahoma State University, Kansas State University, and the University of Illinois. The research results and marketing strategies were also reported in farm publications, internet web sites and to professionals in other Land Grant Universities at a symposium at the professional meetings.

Impact(s):
Approximately 143 million bushels of wheat are sold each year in Oklahoma. The marketing-year average net price (market price minus storage and interest) is about $3 per bushel. The average price received by Oklahoma producers is estimated to be $3.09. Research indicates that improving the timing of one-third of Oklahoma wheat production would increase the price received about 20 cents per bushel for about 12 million bushels.

Benefit of Proper timing of wheat sold:

(1) 48 million bushels of wheat sold for a net price below $3 per bushel,
(2) reduce 48 million bushels of wheat sold below average by 25 percent,
(3) increase price received for 12 million bushels by 20 cents per bushel.

Improved timing of wheat sales increases producer income by $2.4 million dollars.

Funding Source(s): State; Smith-Lever; Oklahoma Wheat Commission; RMA/USDA

Scope of Impact: State Specific

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Title: Accurate Weed Identification and Understanding of Wheat Dockage Discounts Increase Wheat Producers Bottom Line

Issue:
Infestations of grass weed negatively impact the profit of producers, grain handlers and end users of wheat. Producer losses include reduced grain yield, the cost of chemical control, and increased dockage because of the presence of the weed seed in the harvested grain. Grain handlers must store, clean and ship dockage and foreign material and the end users must clean the grain before processing. Successful cheat and wild oat herbicides controls have been developed. Unfortunately, cheat control has resulted in the invasion by harder to control grasses such as feral rye, jointed goatgrass, rescuegrass, downy brome, Japanese brome, and Italian ryegrass. New herbicides have been marketed for control of these grasses. However, because of due to their

selectivity for particular species, proper identification of the weeds present in an infestation is critical for its/their control. Miss application of an herbicide due to improper identification of the weed pest results in economic loss due to (1) cost of the herbicide treatment, (2) the decrease in grain yield from crop/weed competition, and (3) lower test weight, increased moisture, and increased dockage in the harvested grain.

What Has Been Done:
Successful weed management systems have been developed for cheat and wild oat. Several products are available that will selectively control some of the other grass weeds. Thus, proper identification of the grasses is critical prior to selecting an herbicide. To assist in identification, a poster-size publication was produced by Oklahoma Cooperative Extension Service and Oklahoma Wheat Commission. This publication (L-316; Identification of Grasses Commonly Found in Oklahoma Wheat Fields) contains high-quality, color-images detailing the specific characteristics necessary for accurate identification of each grass. Between May 2005 and January 2006, approximately 10,000 copies were distributed. To better educate Oklahoma wheat producers of the importance of wheat dockage discounts, Fact Sheet 601 (Do Not Cheat Yourself: Cheat Control is not a Cost) was also developed.

Impact(s):
Approximately 4 million acres of wheat is currently being grown for grain in Oklahoma. Correct identification of the weeds present in these wheat fields followed by the appropriate herbicide application resulted in improved wheat grain yields and lower dockage and foreign material in the harvested grain. In addition, the expense of herbicide needed for weeds not controlled with the first application is avoided.

Benefit of Proper Weed Identification on Herbicide Application Costs:

(1) 2 million acres of wheat was sprayed in 2005 for grass weeds,
(2) 5% of the weeds on this acreage were misidentified and the incorrect herbicide used,
(3) this acreage was retreated with correct herbicide (a cost of approximately $15/acre).

An herbicide application savings of $1.5 million could have resulted with proper identification.

Benefit of Proper Weed Identification on Value of the Marketed Grain:

Failure to control the problem weeds above generally result in 10 to 20% dockage in the marketed grain, opposed to 0-1% with proper herbicide application.
(1) 2 million acres of wheat was sprayed in 2005 for grassy weeds,
(2) 5% of the weeds on this acreage were misidentified and the incorrect herbicide used,
(3) acreage was NOT retreated, resulting dockage was 10% in the harvested grain,
(4) the average grain yield was 30 bushels/A with a market price of $3/bushel.

A $1.92 million dockage loss could have been avoided with proper identification and correct herbicide application.

Funding Source(s): State; Smith-Lever; Oklahoma Wheat Commission

Scope of Impact: State Specific

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Title: **Oklahoma Quality Beef Network**

Issue:
Cattle sickness costs the industry millions of dollars each year. These losses negatively impact producer profitability and they impact each and every level of the beef production chain. These losses are felt at the producer level through decreased performance, death loss, increased costs associated with treating sick animals, increased labor expenses and additional expenses for equipment, to name a few. These losses many times extend beyond the cow-calf producer to each of the other sectors of the beef economy. Chronically ill cattle place a huge financial burden on the entire industry as the cost of carrying such cattle replicates itself throughout the life of the calf. Unfortunately the cost burdens associated with cattle sickness do not stop once the cattle are harvested. There are a number of well-documented studies including the 1995 and 2000 Beef Quality Audits that clearly illustrate that sickness in cattle, at even an early age, can have dramatic impacts on carcass quality, tenderness, and in some extreme cases the condemnation of entire carcasses.

What Has Been Done:
In order to facilitate the adoption of best management practices that should result in reduced sickness and associated adverse effects, the Oklahoma Quality Beef Network (OQBN) was developed in 2001. The objective is to add value to Oklahoma's calf crop and capture at least part of the added value. During the initial phase of the OQBN, a source and process verification system has been implemented focusing on management practices around the time of weaning. In general, OQBN process verification (or certification) requires producers to wean their calves at the home ranch for a minimum of 45 days and follow specific quality assurance, vaccination and nutritional guidelines.

During the start-up phase, County Educators and Area Livestock Specialists collaborated with the Oklahoma Cattlemen's Association and producers by serving as "OQBN Representatives". In this capacity, Extension personnel provided education to the producers and inspected the cattle prior to marketing to insure that the integrity of the program was upheld. However, as the program evolves, Extension's role is gradually shifting to one of training local cattlemen, veterinarians and other industry leaders to serve as "OQBN Representatives."

Extension personnel have collaborated to collect extensive evaluation data. One evaluation data set includes just over 35,000 head of OQBN certified and non-certified cattle. These data have

been used to determine the financial impact of the program. In addition, participating cattle producers (both sellers and buyers) have received a follow-up survey. This survey provides valuable feedback for the purpose of documenting the programs impact as well as strengths and weaknesses. Seven case studies were conducted to document typical program costs and changes in gross revenue. This past year, 1,711 OQBN certified calves representing 45 different sale lots from eight different OQBN sales were tracked for 90 days after the sale event. Health and death loss of these OQBN certified cattle was compared to health and death loss of CONTROL lots of cattle. The criteria for selecting CONTROL lots of cattle included the following: similar breed type, similar weight class and quality, the cattle had to be purchased during the same week, and the control cattle must have no known health history.

Impact:
Between six and eight regional OQBN certified calf sales have been scheduled and held each of the past four years. During this time, approximately 21,000 head of cattle have been certified. On average, cattle buyers were willing to pay $5.01 more per cwt for groups of OQBN cattle compared to calves that had no documented background or management. The average price premium has been about $32 per head, while the added value of weight gain during the preconditioning period averaged $56 per head for a gross increase in revenue of $88. Documented program costs have averaged $64, resulting in an average increase in net income of $24 per head. This increase in net income does not consider the potential improvements in animal performance or carcass quality beyond the initial marketing (cow/calf) phase. According to survey data, 75% of the participating cow/calf producers had not historically preconditioned their calves. Furthermore, over 93% of the participating producers are pleased enough with all aspects of the program that they indicate that they will participate again in the future. In the cattle tracking project conducted during the winter/spring of ‘03/04, the incidence of one or more treatments for sickness (expressed as mean % of the sale lot or management group) was greater ($P<.01$) for CONTROL (29.1%) compared to OQBN certified cattle (6.7%). Similarly, the incidence of death loss was significantly higher ($P<.01$) for CONTROL (3.0%) compared to OQBN certified cattle (.1%). Perhaps the most significant impact the OQBN has had on the beef industry in Oklahoma to date cannot be measured by participation in the OQBN itself. According to Bill Barnhart of OKC West Livestock Market, Inc., and President of the Oklahoma Livestock Marketing Association, “Since producers began to see the success of the OQBN, we have seen a dramatic increase in the number of cow/calf producers weaning and preconditioning their calves before bringing them to the livestock marketing facilities across the state. It is apparent to me that the industry is finally ready to adopt this value added opportunity.”

Funding Source(s): State; Smith-Lever; Oklahoma Department of Agriculture

Scope of Impact: State Specific

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Key Theme – Animal Production Efficiency

Title: **Master Cattleman**

Issue:
Beef production accounts for approximately one-third of Oklahoma's agricultural production in most years. Moreover, seventy percent of the state's 86,000 farms have some cattle and over fifty percent of the land area in OK is pasture or rangeland. However, most of the cattle operations are small in size, with seventy-eight percent of the beef cow inventory in herds of fifty head or less. Smaller cattle operations have higher cost of production and are less likely to incorporate best management practices. Therefore, these small to moderate-sized cattle operations tend to have lower economic and biological efficiency. The objective of this project is to enhance the biological and economic efficiency, as well as enhance the quality of life of beef cattle producers through a comprehensive and consistent educational curriculum delivered locally.

What Has Been Done:
In the first phase of this project, an interdisciplinary team of state specialists, area specialists and other professionals contributed to the publication of a beef cattle manual. Manual editing was provided by a consultant and Agricultural Communications Services plus team leaders. The University Print Shop published the manual. Approximately 5,500 manuals have been distributed through local Extension offices. USDA Risk Management Agency provided funding support for the manual and educator in-service training. The manual contains 40 chapters including various business, production, and natural resource topics.

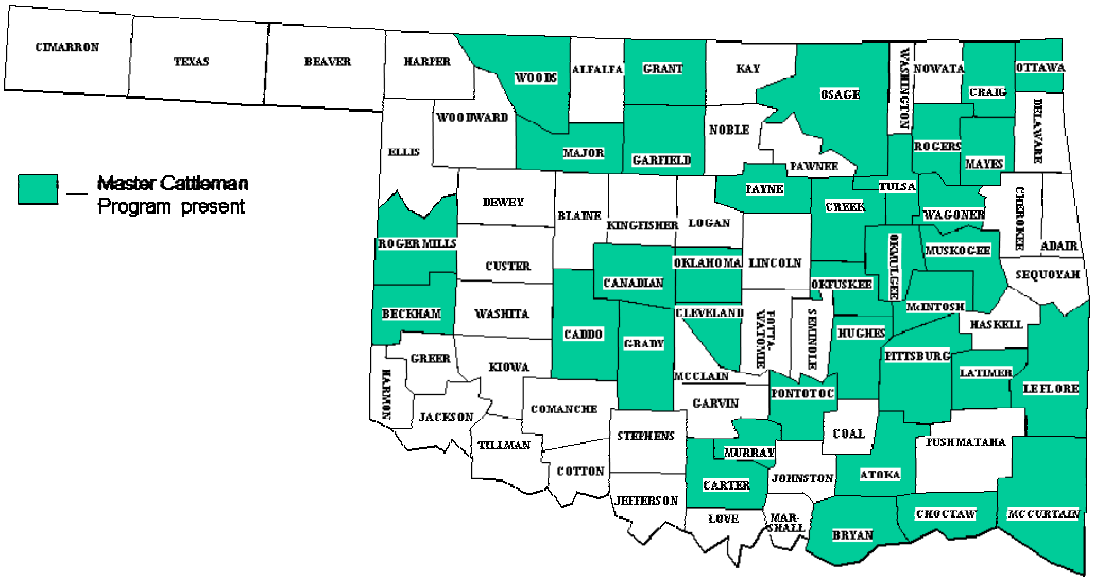
In the second phase of the project, a Master Cattleman program was developed using the Beef Cattle Manual as the primary reference. To receive certification as a "Master Cattleman", a producer must complete twenty eight hours of instruction and successfully complete the quiz associated with each learning module. Learning modules are provided to educators through a web site (www.agecon.okstate.edu/cattleman). Each module includes the chapter from the manual, PowerPoint slides, lesson plans, a quiz and a quiz key. Extension educators provide most of the instruction and meeting series coordination, in cooperation with state and area specialists. Funding for travel, training, printing, editing and other educational materials was provided through a grant from the Risk Management Agency, USDA: "Risk Management Education for Beef Producers". The expected long-run impact is that producers will have a better base for making decisions, improving financial and production performance**.**

Impact:
Along with the Oklahoma Beef Cattle Manual, OSU and OCES faculty and extension educators continue to offer a comprehensive educational program for beef producers; Oklahoma Master Cattleman. Currently there are 21 active groups across the state with many extension educators and area specialists providing local leadership and training. Currently, 620 cattle producers are enrolled in

the program from 61 counties. An additional 78 producers have graduated from the program within the past year.

Between the time period of October 1, 2004 and December 31, 2005, 271 educational programs were held with a total of 9,692 person-hours of instruction delivered. State, county and area specialists are conducting a "risk management and production practices" assessment in order to measure the impact of the program over time. This assessment is being conducted independent of the Risk Management Agency funding.

Figure 1. Locations of Master Cattleman Groups in Oklahoma



Funding Source(s): USDA Risk Management Agency

Scope of Impact: State Specific

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Key Theme - Biofuels

Title: Oklahoma Credential Cooperative Director Program

Issues:
The board of directors of an agricultural cooperative has responsibility for strategic decisions and for safeguarding the organizations assets. Agricultural cooperative board members are producers who are elected by the membership to serve with only token remuneration. In recent times, all board members, including cooperative board members are under intense scrutiny. The incidence of legal proceedings against board members has increased dramatically. These litigations are typically initiated by owner (member) groups and they focus on the competency and diligence of the board. The severe repercussions from errant business decisions and the intense scrutiny of board member competency have created a critical need for educational programs.

What Has Been Done:
In response to the critical need to improve the competencies of cooperative board members the Oklahoma Credential Cooperative Director (OCCD) program was created. The OCCD program involves two days of training on finance, legal responsibilities, parliamentary procedure, effective meeting management, strategic planning and other related topics. In designing the OCCD curriculum, board of director training material from across the U.S. was examined. OCCD instructors include OCES faculty as well as industry experts including bankers, auditors, attorneys and consultants. The OCCD program is delivered simultaneously at a central location and via two-way interactive video at eight remote locations across Oklahoma.

The OCCD program was initiated in November of 2001 Since then it has been offered eight times (spring and fall) with six advanced sessions. Over 225 directors have attended the Credentialing sessions and over 175 directors have returned for advanced training.

Impact:
The directors completing the OCCD program have a better understanding of financial management and the legal roles and responsibilities of the board of directors and are able to make better business decisions and to safeguard the assets of their cooperative organizations. Currently there are 121 Credentialed directors representing 44 cooperatives. There are 104 more directors who have completed one of the two required sessions. One hundred and seventy five directors from 37 separate cooperatives have attended an advanced session. The advanced attendance reflects the fact that almost every credentialed cooperative director returned for additional education. Twenty cooperatives have achieved the status of having every board member credentialed. The typical Oklahoma cooperative includes 1,500 or more farmer members and organizational assets of over $10M. The OCCD program impacts thousands of Oklahoma producers by enhancing the board's ability to manage and safeguard cooperative assets

Scope of Impact: Seventy-four cooperative organizations across the entire state of Oklahoma.

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Key Theme – Diversified Alternative Agriculture

Title: Introduction of Winter Tolerant Canola

Issue:
Canola is a broadleaf crop primarily grown for its edible oil and meal qualities. In recent years, research has developed winter tolerant varieties that offer promise as a rotational crop with winter wheat. Since canola grows much like wheat and is planted and harvested with the same equipment as wheat, can our producers utilize these new winter tolerant canola varieties to use in a crop rotation?

Oklahoma producers need to learn more about growing canola as a crop and how to handle canola at harvest. The OCES Extension Ag Educators in northwestern Oklahoma hosted educational programs and provide field demonstrations to help producers understand the crop in field situations. They assisted in drill calibration, crop scouting and harvesting of the corp.

Impact:
Eighteen field demonstrations were presented to producers and one educational program at the conclusion of the project was provided to those interested in canola production. The demonstrations drew 634 producers and the educational program drew 396 registered producers. Producers were exposed to production problems with canola as well as how well the crop grew. First time canola producers had 13,000 acres planted in northwestern Oklahoma. This was an increase over the 60 acres grown in 2004. The industry grew from having one delivery point of the canola to 6 delivery points of canola at harvest. There is currently an oil seed crushing facility being built in Okeene so that we now have a processor of canola in northwest Oklahoma at Okeene. As producers become more accustom to canola we hope to see increased acres and more infrastructure build to handle the new crop in northwestern Oklahoma.

Scope of Impact: Multi-state

Funding Sources: Smith-Lever, State

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Title: Extension Educational Programs for the Oklahoma Wine Grape Industry

Issue:
The Oklahoma grape industry has experienced a resurgence of interest and enthusiasm during the last four years. Interest has come from wineries, grape growers, and others, e.g. chambers of commerce, interested in economic development. Much of the total economic development potential comes from tourism and spin off sales associated with the wineries which tend to be located in smaller communities. Total wine sales in OK are near 2 million gallons per year. Potential exists for Oklahoma vineyards and wineries to increase market share by producing grapes, making and selling wines locally. The industry enjoys popular support from the legislature and the general population as an initiative in 2000 which revised state laws to put OK wineries in a better competitive position received over 70% approval from the people.

What Has Been Done:
In 2000 a team of Extension specialists was assembled to develop an educational program for Oklahoma grape producers. The core team consisted of specialists from Horticulture, Entomology and Plant Pathology. Key support has also been provided by specialists in soils, irrigation and agriculture economics who have assisted with instruction and contributed to development of educational materials.

As a result of this team effort the Oklahoma Grape Management Course has been designed and offered four times. The course meets seven times per year for a period of four hours. Area meetings for grape growers and county educators were held in southwest and northwest Oklahoma. Grape related articles have been added to ongoing newsletters related to fruit production, an Oklahoma Vineyard Management Guide has been drafted and budgets have been prepared to assist potential grape growers with decision making.

Demonstration/research projects have been initiated to secure reliable data on grape variety adaptability and pest management requirements in the various regions of Oklahoma. Competitive grant proposals have been successfully submitted to various funding agencies including Integrated Pest Management and private foundations (Kerr Center for Sustainable Agriculture) to procure funds

Impact:
In the last four years OK grape acreage has increased from about 50 to over 550 and the number of licensed wineries has increased from about 4 to 32. Over 380 people, including 17 county extension educators, have taken the Oklahoma Grape Management Course its first four years. As a result of this educational program potential grape growers from 50 counties have learned about the economic potential of wine grapes, how to reduce environmental risk through proper variety selection, how to accurately scout for insects and diseases and how to install and manage a vineyard. Initial data have been collected from demonstration plantings on grape variety adaptability as well as insect and disease incidence at four locations in OK and results disseminated to growers.

Scope of Impact: State Specific; Integrated Research and Extension

Funding Sources: State; NGO; Smith-Lever

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Key Theme – Emerging Infectious Diseases

Title: West Nile Virus Disease Prevention Efforts in Canadian County

Issue:
West Nile Virus disease was documented in Canadian County 6-7 years ago. West Nile Virus is a disease vectored by mosquitoes to horses and humans. Canadian County Extension's "Recycle Day" has been a front-line defense in preventing infections of West Nile Virus. Our annual "Recycle Day" has been working to eliminate the spread of West Nile problems 6 years before our county population became at risk to this disease. Used tires lying around are the perfect breeding ground for mosquitoes vectoring West Nile Virus. Our recycling program has eliminated 22,030 potential mosquito breeding sites throughout the county.
Key in our efforts to minimize the spread of West Nile Virus has been providing citizens an environmentally friendly opportunity to dispose of recyclable used tires. In addition to collecting tires, our county office also collects used oils, batteries, computers, and white goods at each "Recycle Day". Our mission is to keep these recyclable materials out of ground water resources, landfills and roadside ditches. Canadian County Extension has held our "Recycle Day" annually for the past 12 years to give citizens environmentally sound options for disposal of recyclable materials and prevent the spread of diseases like West Nile Virus.

What Has Been Done:
Over the past 12 years, the citizens of Canadian County have responded to this opportunity to "do the right thing" by delivering 22,030 car and large truck tires, 815 car batteries, and over 9,000 gallons of used oil for recycling. County extension staff's efforts have resulted in the disposal of used tires at a chipping plant in Oklahoma City, which receives $1 per car tire and $3 per truck tire out of the state's tire indemnity fund. The batteries have been sold to a smelter to defray the expense of the roll-off boxes used to collect the tires. Used oil has been recycled at the Canadian County District #1 shop, where it is burnt to provide heat for the shop during the winter months. This benefits county taxpayers by saving the money that would normally go to buy natural gas to heat the county shop. Estimated savings to the county general fund is about $60 per day when the county uses recycled oil in place of natural gas to heat the shop.

Impact(s):

- Recycled 22,030 used car and truck tires, 815 car batteries, over 9,000 gallons of used oils, 210 white goods, and 27 obsolete computers.
- Removed over 22,030 tires from the environment which greatly reduces potential habitat for mosquito breeding and reproduction.
- Over 9,000 gallons of used oils put to good use and kept out of our groundwater.
- The lead from 815 batteries has been recycled and kept out of the environment.
- County taxpayers have saved over $16,000 in natural gas expenses at our county shop over 12 years.

Scope of Impact: State Specific

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Key Theme: Home Lawn and Gardening

Title: The Oklahoma Master Gardener Volunteer Program

Issue:
Rapid urban growth in many areas of the United States coupled with increased interest in the environment and home gardening have prompted an ever-increasing number of garden and landscape inquiries. Along with this interest, comes a multitude of gardening questions needing individual explanation and too few Extension staff members to answer each question. Many of these questions are seasonal in nature and are relatively easy to answer assuming that one has horticulture training.

What Has Been Done:
Oklahoma Master Gardeners are trained, supervised and recruited to: 1) improve overall efficiency in providing one-on-one service to the non-commercial horticulture clientele in the county, 2) provide group learning and teaching activities for non-commercial clientele, 3) allow agents to develop proactive Extension programs, and 4) form a group of Extension volunteers to support additional consumer horticulture efforts.

Trainees participate in a 10 - 13 week course receiving between 40 - 56 hours of course work on subjects including: basic plant science, vegetables, fruits, nuts, ornamentals, lawns, diagnosing pest problems, soils, and other related topics. Upon completion of the training period, satisfactorily passing an exam on materials and topics covered, and donating between 40 - 56 hours of volunteer time to the Horticulture program, the trainees are certified and awarded the title of Oklahoma Master Gardener.

Examples of Master Gardener Volunteer activities include: staffing plant clinics to answer phone and walk-in questions, manning educational exhibits, maintaining demonstration gardens, community beautification projects, serving as 4-H hort leaders and judges, speaking at club/civic meetings, teaching horticulture activities at nursing homes, etc., assisting in horticulture mailings, newsletters, etc., and appearing on TV and radio.

Impact:
The service from the Master Gardener volunteer program has proven to be a highly popular means of extending the knowledge of the Oklahoma State University Cooperative Extension Service to the residents of Oklahoma. The Oklahoma Master Gardener Program now has 34 counties participating in the program. Approximately 297 new Master Gardeners were trained during the 2005 training season. Over 1,200 active Master Gardeners volunteered their time, contributing approximately 13,880 hours of volunteer service and reaching over 95,000 Oklahomans with over 430 educational and community programs and activities being conducted in their communities in FY2005. This translates to over $229,000 in service that was donated by volunteers (wage rate of $16.54/hour was used, which includes a 12% estimate of fringe benefits. This hourly rate is the assigned wage for nonagricultural workers in 2002 as published in the *Economic Report of the President* (2002 edition). The Independent Sector, an organization that "serves as a national forum to encourage giving, volunteering and not-for-profit initiative," supplied this information).

Funding Source(s): State; Smith-Lever

Scope of Impact:
The Oklahoma Master Gardener volunteer program is "state specific;" however, continued training opportunities may be multi-state, regional or national.

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Key Theme – Plant Production Efficiency

Title: Tillage and Cropping Systems to Increase Dryland Crop Production in Southwest Oklahoma

Issue:
Dryland crop production in Southwest Oklahoma is a function of moisture, nutrients, temperature and heat indexes, and soil moisture retention. Jackson County in particular is an example of two production extremes. Irrigated cotton acres in the county comprise the highest gross agriculture production in terms of crop production. However, with cotton production on these acres in excess

of 100,000 bales annually at an average of 2.2 bales per acre there remains in excess of 250,000 acres in crop production with an excess of 200,000 acres in dryland production. Increasing profitable and consistent production on these dryland acres while not introducing new pest management issues is of prime concern to agriculture producers. To accomplish this it is necessary to address the tillage and cropping systems needs that will conserve moisture, increase the soil nutrient and moisture supply reservoir, and increase crop yield components while monitoring critical pest management issues such as weed and insect species and populations.

What Has Been Done:
A Tillage and Cropping Systems Study was established in Jackson County on the Southwest Research and Extension Center in fall 2002. The initiation of this study was in response to producer requests, indicated by the Jackson County Extension Program Advisory Committee, for dryland no-tillage production information to help address rising production input costs. The study is comprised of two tillage treatments; No-Tillage (NT), and Conventional Tillage (CT); 3 crops (Cotton, Grain Sorghum, and Wheat) arranged in 7 cropping systems; Cotton-Wheat-Grain Sorghum (C-W-GS), Cotton-Wheat (C-W), Cotton-Grain Sorghum (C-GS), Wheat-Double Crop Grain Sorghum-Cotton (W-DCGS-C), Cotton (C), Wheat (W), Grain Sorghum (GS); with cropping systems randomized in both tillage treatments. Insect and weed species composition and populations, production economics, and soil organic matter (SOM) are measured within both tillage and cropping systems.

Impact:
Again, this study is the direct result of a producer identified priority in Jackson County. Dryland producers along with some irrigated crop producers requested information and work related to conservation tillage production systems to help lower production input costs and/or increase return dollars. To date, six out of seven of the no-tillage crop systems are showing an average of $44/acre higher return above production inputs. Three field tours, two conferences, one state program meeting and in-service, and program advisory meetings have now been conducted utilizing this project with between 250 and 300 producers having been exposed to this extension/research project. This study has met with a positive reception among producers with continued requests and interest in the results and findings. One producer quote stated “We need this type of work and information for both us and our bankers”. This study is approximately half way through its expected duration.
Funding Source: Oklahoma Grain Sorghum Commission Grant, County, State, Smith-Lever

Scope of Impact: County and Area

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Key Theme – Precision Agriculture

Title: Sensor-based Nitrogen Recommendations

Issue:
Nitrogen fertilizer is expensive, yet most wheat farmers in the southern Great Plains employ tradition-based nitrogen fertilization practices. That is, they fertilize the same way they always have, regardless of crop condition, nitrogen mineralization, or crop yield potential. This results in reduced profitability for the farmer, increased environmental impact, and inefficient allocation of fossil fuel resources. Skyrocketing nitrogen fertilizer prices, however, has increased the interest among farmers in implementing new technologies to reduce nitrogen fertilizer use. Further, increased public awareness of off-site movement of nitrate nitrogen has dictated that agricultural producers become more efficient when using nitrogen fertilizer.

What Has Been Done:
A research-based methodology for sensor-based nitrogen recommendations was developed by research staff at Oklahoma State University. This technique provided farmers with a long-needed tool to provide in-season assessment of crop nitrogen needs, which would result in greater nitrogen use efficiency and reduced total crop nitrogen inputs. Initially extension efforts consisted of the traditional avenues for information delivery such as grower meetings and fact sheets. This approach achieved the goal of grower awareness but was not as effective at addressing grower apathy or achieving goals of implementation. Grower apathy was remedied by high nitrogen fertilizer prices. Workshops were conducted in 2005 and 2006 in order to increase on-farm implementation of the sensor-based nitrogen recommendations program. These workshops used the novel approach of training farmer/extension educator pairs in the use of sensor-based nitrogen recommendations and equipping these same individuals with hand-held sensors necessary to measure crop nitrogen needs.

Impact:
Since our first workshop in 2005 we have trained 24 farmer/extension educator pairs and numerous fertilizer industry professionals in the use of sensor-based nitrogen recommendations. Using this train-the-trainers approach we anticipated a significant multiplier effect, and, based on preliminary observations, we seem to be making significant headway. For example, one fertilizer dealer in attendance at our January 2005 meeting provided sensor-based nitrogen recommendations as a free service to their clients on over 600 fields in the 2005/2006 crop year. Based on historical data, improving the validity of wheat nitrogen recommendations in the state of Oklahoma would save producers $12 to $15 per acre on an annual basis. This equates a potential of roughly 90 million dollars that can be saved by stakeholders on an annual basis. Therefore, since the potential payoff is great, we will continue to work on changing the wheat fertilization behaviors of growers.

Funding Sources: State; Smith-Lever; Oklahoma Wheat Commission

Scope of Impact: Southern Great Plains wheat production area (Oklahoma, southern Kansas, Texas, southeastern Colorado, and eastern New Mexico)

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Key Theme – Risk Management

Title: Risk Management Education for Specialty Crop and Livestock Producers

Issue:
Pecans, watermelon, and peaches are significant horticultural crops in Oklahoma with other commodities (e.g., wine grapes) being considered in hopes of increasing farm profit. An increased demand for goats and goat meat has triggered a growing popularity of raising goats in Oklahoma. Producers need assistance in realistically evaluating financial prospects of alternative enterprises and in identifying cost effective ways of producing such commodities. Enterprise budgets offer valuable decision support in analyzing profit potential while documenting resources, cultural practices, and technology used in the production activity. Knowledge of budgets and the ability to use them will assist producers with farm and financial planning.

What Has Been Done:
In October 2003, Oklahoma State University (OSU) began a one-year partnership agreement with the USDA - Risk Management Agency to develop and deliver software tools designed to help Oklahoma producers assess financial risks associated with specialty crop production. Five horticultural budgets were developed and publicly released in April 2004. Since the original release, over 500 producers were directly contacted via software presentations and displays. Additional contacts were made through individual visits, professional and paraprofessional trainings, direct mailings, and popular press articles. A meat goat enterprise budget along with instructional materials will be released in early 2006. Langston University has provided joint authorship of budget assumptions and data collection. A stocker goat budget will be released later in 2006.

Impacts:
A continued series of "hands-on" computer workshops and seminars will be conducted with the expected outcome of improved profitability through improved farm and financial skills. Software promotional efforts will be targeted to commodity group membership around the state. Evaluation will consist of attendance and information requests plus pre-and post surveys to measure knowledge skills or behavior before and after participation/purchase. An estimated 150 specialty crop and goat producers are expected to be contacted directly via educational settings. Horticultural crops are management and capital intensive with annual expenses over $1000 per acre commonly reported. Although goat production is less expensive per budget unit, parasite

management, predator control, and fencing do present challenges. Through better financial management and production performance, average improvement in annual net farm income of at least $50-100 per producer ($7,500-$15,000 total) is expected.

Funding: State

Scope of Impact: State Specific

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Key Theme – Small Farm Viability

Title: Caddo County Farmers Market

Issue:
A county-wide farmers market in Caddo County was needed. Although Caddo County is one of the largest vegetable producing counties in Oklahoma, a local market for vegetable producers did not exist. Also, local residents did not have access to locally produced fresh fruit and vegetables. A county-wide farmers market appeared to be a win-win situation for both growers and consumers.

What Has Been Done:
First, the Caddo County Fair Board was approached in March of 2005 to see if they would sponsor a county-wide farmers market to provide a meeting place, market location, and partner with the Caddo County OSU Extension's efforts. Next, the city of Anadarko, Caddo County Commissioners, and the Anadarko Economic Development Authority were made aware of our plans and asked to make suggestions on how to get the project underway. Mike Shulte of the Oklahoma Department of Agriculture, Food, and Forestry was contacted to provide information on rules, regulations, promotion, and certification of a county-wide farmers market. A press release was written requesting venders to participate and the information was also included in the OSU County Agriculture Newsletter. A meeting was held with the vendors and a 6 week trial farmers market was set up to be held once a week, from mid July to the end of August, 2005.

Impact:
Public support was tremendous, over 500 people attended the farmers market during the first 6 weeks. Although only 3 vendors participated the first year, they provided plenty of produce for their customers. An estimated $4,000 of produce was sold during the trial year. But more importantly a precedent was set: 1) Local producers have been made aware that the farmers market will be held in 2006 so that plans to plant vegetables can be made. 2) Residents have been made aware of the quality of locally produced fresh vegetables. 3) The promotion of healthy

foods was made and the improved taste of fresh vegetables was demonstrated to many urban consumers.

Funding Sources: County, State, Smith-Lever

Scope of Impact: State Specific

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CSREES Goal 2: A safe and secure food and fiber system.

Overview

Oklahoma key program components contributing to this goal include: food safety, food preparations, handling of fresh produce, food preservation, HACCP Training, and microbiological testing. During the year, 124 demonstrations, meetings and conferences were conducted under this goal. Participants numbering 23,088 attended these activities during the year. OCES personnel conducted an additional, 1,089 visits and consultations with these audiences. Mass media contacts totaled over 69,000.

Educational and service programming under this goal really fall into commercial categories and home/general public categories. Educational programs with commercial food processing, preparation, and retail sales make up much of our effort. The Oklahoma Food and Agricultural Product Center (FAPC) is a completely state-funded entity that is wholly integrated into the OCES mission in Oklahoma. The Center has conducted numerous HACCP training sessions for food processors in the state. This has resulted in many of these processors ability to develop and maintain acceptable HACCP plans to help them stay in business. The center is working closely with state and federal authorities working on microorganism food security problems. The Center also conducts training sessions for food related entrepreneurs trying to get into business or expand their businesses. Food safety laws and regulations are an important part of this training. The Center also provides educational programs such as the "Master Canners Workshop". This program provides basic training in producing acidified and acid canned foods. Several of those attending these workshops have returned to the Center for additional business and processing assistance. Food service industry personnel in Tulsa have available to them a 12-hour food handlers' course. Local food codes require taking such a course and passing of a test. The OCES course is the only one with materials, classes, and testing also available in Spanish.

The FAPC provided a new progam in FY2005 aimed at processors and handlers of fresh produce. The program provided education and technical assistance food safety practices for production and post-harvest handling of fresh produce. County educators in Oklahoma were trained in accordance with FDA procedures and two workshops for producers were conducted in the state. The Oklahoma FoodSafe Program works primarily with consumers to increase the safety of the food supply. Statistically significant improvements in safe food handling practices observed among the 781 youth and 1,412 adult Oklahomans who participated in the "Healthy Living A-Z" Impact Program included: 1) 23% increase in hand washing, 2) 16% increase in washing fresh fruits and vegetables, and 3) 20% increase in using a separate cutting board for fruits and vegetables to avoid cross contamination.

The OCES conducts numerous nutritional programs. Most of these programs include food safety in selection and preparation of foods in the home. These nutrition programs are reported under CSREES goal 3. The OCES provides much training in the use and proper application of pesticides in food production. Again, most of these efforts are reported under CSREES goal 4. Finally, HAACP, food security and first responder training, and livestock meat quality programs often get reported under CSREES goal 1.

Positive progress was made in all Key Program Components listed under this goal in the Oklahoma Cooperative Extension Service 5-year plan of work. Total expenditures represented by programming and related support for this goal are approximately $800 thousand with $30 thousand from Smith Lever funds. About 5 professional and paraprofessional FTEs contributed to the goal last year. As noted above, due to the categorization of Key Themes by CSREES, closely related efforts in food safety also show up under goals 1, 3, and 4. Following are some example program impact statements arranged by CSREES Key Theme.

Impact Statements Goal 2

Key Theme – Food Handling

Title: Oklahoma FoodSafe Program

Issue:
The Centers for Disease Control estimates 76 million Americans get sick, 300,000 are hospitalized and 5,000 die each year from foodborne illness. Two to three percent of cases lead to secondary long-term illnesses such as reactive arthritis, kidney failure, or meningitis. Costs for lost productivity and health care are estimated at up to $9.4 billion annually. Keeping food safe from farm to table requires a continuous chain of responsibility for the safety of the food. If that chain is broken at any point, foodborne illness can result. Today because of lack of knowledge and/or failure to practice safe handling procedures or to make safe food choices and decisions, the weak link in the chain is often the consumer.

What Has Been Done:
The Oklahoma FoodSafe Program works primarily with consumers to increase the safety of the food supply. By increasing their awareness and knowledge of safe food behavior and choices and

by teaching them to take responsibility for the safety of their food they can reduce their risk of foodborne illness. The program has offered food safety education in a variety of projects including the Oklahoma Healthy Living A-Z Programs for adults and children, leader training for Family and Community Educators, a food safety campaign for the elderly called "Food Safety for Seniors," and the Oklahoma Gardening public television program.

Impact:
Statistically significant improvements in safe food handling practices observed among the 781 youth and 1,412 adult Oklahomans who participated in the "Healthy Living A-Z" Impact Program included:

- 23% increase in hand washing
- 16% increase in washing fresh fruits and vegetables
- 20% increase in using a separate cutting board for fruits and vegetables to avoid cross contamination

Youth that participated in the "Healthy Living Program" were exposed to the primary food safety message that encouraged children to always check for a brown color throughout their hamburgers before taking a bite. Of the 63 children who completed the program forty-three percent increased their score when asked if they checked to see if their hamburger was brown all the way through before eating.

Twenty-two county educators were trained on the "Food Safety for Seniors" curriculum. A summary of results of the 258 evaluations returned by seniors that attended lessons showed:

- Most participants (55.2% of 58) of "Thawing Meat Safely" believed they thawed meat safely prior to the lesson. Of those that did not (44.8%), 42.3% indicated they definitely planned to change and 38.5% probably would to a safer method of thawing.
- Most participants (72.2% of 126) of "Storing Leftovers" believed they handled leftovers safely prior to the lesson. Of those that did not, 54.3% definitely planned to change the way they handled leftovers to reduce their risk of foodborne illness; 28.6% probably would change; 14.3% would think about changing their handling of leftovers; and 2.9% planned no changes.
- More than half (60.0% of 74) of participants of "Cooling Hot Foods" found the need to change the way they cool food to reduce the risk of foodborne illness. Of those, 61.4% definitely planned to change the way they cool food after attending the lesson; 29.5% indicated they probably would change; and 9.0% would think about making a change.

Other educational projects have targeted raising awareness of food safety and increasing a sense of personal responsibility for the safety of food selected and eaten. Substantial numbers of Oklahomans have been reached through such projects as the "Oklahoma Gardening" public television kitchen segments on safe food preservation and preparation reach 220,000-250,000 viewers per weekend for each of its 20 to 30 annual segments.

Funding Source(s): State

Scope of Impact: State Specific

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CSREES Goal 3: A healthy, well-nourished population

Overview

Oklahoma key program components contributing to this goal include: nutrition, health and wellness, and community nutrition education programs. The OCES 5-year plan of work includes key program components under other goals (particularly goal 5) that CSREES chose to include as themes under this goal (goal 3), such as, health care-community health care. Thus some reporting discontinuities may exist between what is reported in the overview and under key themes. During the year, 2,916 demonstrations, meetings and conferences were conducted under this goal. OCES personnel conducted an additional, 7,909 visits and consultations. All these activities resulted in reaching more than 90,637 participants during the year. Approximately 27.1% contacts were with non-white audiences compared to 26.0% in the general population of Oklahoma. The primary non-white audiences were female/Native American, female/Black, and male/Black – constituting approximately 9.8%, 4.7%, and 4.7% respectively of those reached.

Healthy living programs continue as a major focus of extension education in Oklahoma. These programs target dietary and health practices designed to reduce diet related conditions such as: heart disease, stroke, diabetes, and others. These programs touch a wide variety of clientele. Surveys have shown significant improvement in intake of fruits and vegetables, as well as improved safe handling of foods. The OCES community nutrition education programs (CNEP) reach a large and diverse audience across the state. These programs include: EFNEP Families/Nutrition Education, EFNEP 4-H Youth/Nutrition Education, EFNEP Interagency Cooperation, and the ONE Program. For example, in addition to a large number of group educational meetings, professional and paraprofessionals conducted thousands of visits and consultations with clients concerning nutrition. These programs address the full spectrum of nutrition education and information, including: food choices, selection, preparation, healthy diets, prenatal, child and adult nutrition, nutrition related illnesses, food safety, food costs, community gleaning, community nutrition, etc. CNEP impacted 5,747 low income families during FY2005. Of the adult graduates, 90% demonstrated a positive change toward a healthy diet. Cost-Benefit analyses from across the national show that for every dollar invested in nutrition education, between $3.63 and $10.64 is saved in future health care costs. A research study conducted during 2000 found that Oklahoma realizes a 36% gain on their investment in CNEP. The gains primarily come from decreases in nutrition-related illnesses resulting in lower medical costs and an increase in worker productivity (fewer sick days).

In Oklahoma, 56% of adults are overweight and 21.9% are obese. The proportion of overweight children has tripled since 1980. In Oklahoma, 13% of children between ages 6 and 11 are obese. Cooking with Kids, Healthy Kids-Healthy Futures, New Community Project, Dairy is Dynamite, and Fitness U and Nutrition (FUN) are just some of the programs OCES is employing to address the problem from a children and youth perspective. The overall goal is to empower youth to make healthy choices in their everyday living that will attribute to a lifetime of healthy living. Outcomes and impacts include increased intake of fruits and vegetables, increased levels of exercise and physical fitness, increased consumption of milk, and dairy products, and better food safety and food handling techniques.

Family Consumer Scientists also have program targeting other groups like the Medicare Touch and Dining with Diabetes programs designed to assist particular high-risk groups with issues. A program area of rapidly growing emphasis for OCES has been rural health care. Medical facilities and services are vital to the quality of life of rural residents and the survivability of rural communities. Numerous communities have worked with OCES to maintain health care or add to health care facilities. These programs are closely related to the community health services and infrastructure programs discussed under goal 5. Together they are helping many rural hospitals find a means to remain open and to contribute to the health and economy of these communities.

Positive progress was made in all Key Program Components listed under this goal in the Oklahoma Cooperative Extension Service 5-year plan of work. Several of these programs (particularly those mentioned above) have grown over the past few years. Total expenditures represented by programming and related support for this goal are approximately $4.6 million with $1.3 million from Smith Lever and other federal funds. About 50 professional and paraprofessional FTEs contributed to the goal last year. Following are some example program impact statements arranged by CSREES Key Theme.

Impact Statements Goal 3

Goal 3 – Key Themes

Key Theme – Human Health

Title: ***Fitness yoU and Nutrition*** **(FUN)**

Issue:
In a recent report *Preventing Childhood Obesity: Health in the Balance* it is reported that since the 1970's the percentage of obesity has more than tripled for youth aged 6 – 11 and doubled in youth aged 12 – 19. In the United States today, an alarming 30% of children and adolescents are overweight and obese.

Obese young people have a 70% chance of growing up to be obese adults. Being obese is as taxing on an individual's health as it is on society's bankbook. In 2000, the United States paid out more than $117 billion in medical care due to overweight and obesity.

Since the fourth "H" is Health, it is important for our 4-H youth to learn not only that health is important but how to be healthy. Teaching young people how to make healthy lifestyle choices and what those choices are in a fun and accepting environment will teach skills for a lifetime. Research supports that the increase of fruits and vegetables to 5-a-day helps combat obesity, cardiovascular disease, and Type II Diabetes as well as providing other health benefits. Tulsa County 4-H members who are 9 – 12 years of age will participate in a four day educational experience which focuses on nutrition and fitness. The **FUN** day camp stands for **F***itness* **U** *and* **N***utrition*. This program utilized the Health and Food curriculum available through the National 4-H Curriculum Center, Fit Kids Coalition, Oklahoma Beef Council Cooking School, and other community resources, and the Extension Service.

What Has Been Done:

- One four-day "Just for FUN" (Fitness, yoU, and Nutrition) 4-H Day Camp focused on teaching participants Fitness and Nutrition.
- Two "Get Real, Get Fit" fairs have been conducted in partnership with the Tulsa City-County Library System reaching families of middle school age youth.
- Four Health Fairs have been served with the "FUN" display teaching how to read a food label for a healthy habit and how to determine and improve your fitness levels.
- Two family fairs have been served with the FUN display reaching limited income, as-risk, and minority audiences.
- One staff development workshop has been conducted sharing the format and results of the FUN program.

Impact:

- Participants increased the intake of fruit from .87 to 1.46 servings per day.
- Participants increased their intake of vegetables from 1 to 1.8 servings per day
- Participants improved washing hands before preparing meals by 54 percent
- 100% of participants improved washing fruits and vegetables before consuming.
- Participants improved safely using knives and cutting boards by 140%.
- 100% of participants reported eating fruits and/or vegetables in a new or different way as result of the camp.
- Each participant received their personalized "My Pyramid" guide from the USDA as a part of the day camp.
- Participants learned about the importance of including a variety of foods in their diet every day and how to plan meals.
- 100% of participants learned and practiced kitchen and food safety skills.
- 95% of participants completed 4 exhibits as a result of the day camp including food and kitchen safety; crafts; skits; and careers.
- All participants were involved in an average of 258 minutes of exercise or fitness over the four day camp. The USDA recommends a minimum of 60 minutes per day.
- Each participant performed in the FUN Skits which focused on one of the objectives of the day camp. This was an opportunity for the groups to teach the others about what they learned and truly reflected what the participants learned.
- 1998 people have learned about fitness and nutrition with the FUN Educational Display.

Scope of Impact

- Additional requests have been received from agencies for the OSU Extension Service in Tulsa and neighboring counties to be involved in programs affecting the health and wellness of Oklahoma.
- Award applications were submitted to the National Extension Association of Family and Consumer Sciences and the National Association of Extension 4-H Agents.
- One employee "FUN for Life" 6-week wellness series has been planned for the spring of 2006
- Several requests for materials for the program from other Oklahoma Extension Educators has been received.
- Networking with Community Care for Health Fairs has provided an outreach for Extension Programs to reach audiences that otherwise may not be familiar with the OSU Extension Service

Source of Funding: Smith Lever Act, Oklahoma4-H Foundation ($500.00), Oklahoma Beef Council (400.00)

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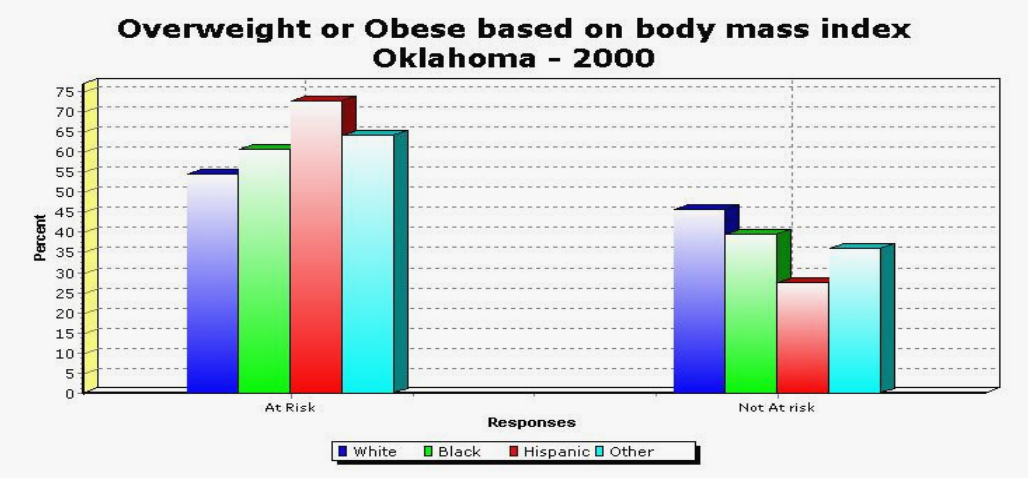
Key Theme – Human Nutrition

Title: Community Nutrition Education Programs (CNEP)

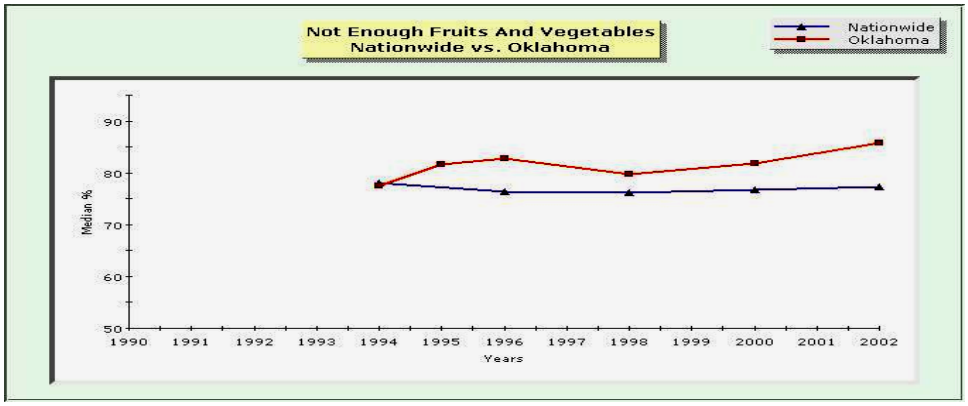
Issue:
Behavioral chronic disease risk factors are of concern for Oklahoma's low income families and youth. Behavioral Risk Factor Surveillance System (BRFSS) data from 2000 indicate that families living in Oklahoma are in desperate need of nutrition education. The consequences of poor dietary quality, lack of physical activity and being overweight or obese are staggering. Oklahoma's rates for being at risk for health problems related to increased BMI are higher than the national average, especially for our Black and Hispanic populations as noted in Figure 1 below.

Figure 1



Furthermore, approximately 85% of Oklahomans do not consume the recommended number of servings of both fruits and vegetables. This percent continues to climb, and has outpaced the national average since 1994 (see Figure 2).

Figure 2



What Has Been Done:

Through the CNEP program, OCES has leveraged state monies to bring over $3 million (FY05) in federal nutrition education program funds. This funding supports 110 jobs in 39 Oklahoma counties. CNEP is a voluntary program for adult participants of federal food assistance programs as well as impoverished youth in qualifying schools and communities. Program participants learn to feed their families in order to promote good health and to plan and budget their food dollars so their family won't go hungry at the end of the month.

Impact:

CNEP has had a positive impact on the health and wellness of 5,747 low-income Oklahoma families during FY05. Over 90% of adult graduates demonstrate a positive change towards a healthy diet. Graduates increased their consumption of fruits, vegetables, and calcium/dairy foods by a combined average of 32%. In addition, 41% of graduates less often ran out of food by the end of the month and 30% report that their children ate breakfast more often.

Through CNEP's youth component 13,941 children have learned and practiced skills in selecting low-cost healthy foods and safe habits for handling foods. A majority of youth (10,933) were taught through school enrichment programs, but 2,432 children received their nutrition education through short term programs and day camps, and 493 youth were in a more traditional, organized 4H club setting.

Cost-benefit analyses from across the nation show that for every $1 invested in nutrition education, between $3.63 and $10.64 is saved in future health care costs. Research in Oklahoma determined that the state saves $1.36 in future health care cost for every $1.00 spent on this program. The gain comes from the decrease in nutrition related illnesses, thereby reducing medical costs and an increase in worker productivity (less time away from work due to illness).

In addition to traditional partnerships, such as DHS and WIC, CNEP utilizes volunteer efforts at the community level to enhance and supplement our mission. During FY05 it was calculated that community volunteers committed over thirteen thousand hours, equivalent of over six full time employees, to the Community Nutrition Education Program efforts for an estimated dollar value over $168,000.

Scope of Impact: State Specific

Source of Funding: Grant, State

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Title: Dairy is Dynamite

Issue:
Calcium is one of the nutrients most likely to be lacking in the American diet. Therefore, low calcium intake is recognized as a major public health problem. Adequate calcium and vitamin D intake are crucial to develop optimal peak bone mass and to preserve bone mass throughout life. According to government statistics seven out of ten teen boys and nine out of ten teen girls do not get the calcium they need for development of peak bone mass. Numerous studies have identified calcium intake and dairy foods as a key dietary strategy for attaining peak bone mass and for preventing and treating osteoporosis and reducing fracture risk.

What Has Been Done:
The Family and Consumer Sciences (FCS) Extension Educators from Canadian and Oklahoma Counties received a grant to provide nutrition education focusing on dairy and physical activity lessons to school-age children. Four elementary schools, two located in Oklahoma County and

two in Canadian County, were selected to participate in the "Dairy is Dynamite" program. The program was taught over a period of five months to a total of 35 classes reaching approximately 750 students. Ages ranged from 9 to 11 years.

The "Dairy is Dynamite" project consisted of three components – Nutrition Education, Physical Activity and an Interactive Skit.

- The Nutrition Education consisted of four monthly lessons and one future lesson. The lessons featured MyPyramid and Portion Sizes: Healthy Snacks and Food Labels: Think Your Drink; Breakfast and Cooking Demonstration; and Bone Up On Calcium.
- The Physical Activity lesson was personalized for each school.
- The Interactive Skit was performed for the lower elementary students at each school. Each individual school created their own skit about dairy.

Impact:
The "Dairy is Dynamite" Program reached a total of approximately 750 students over a five month period. Written pre- and post-tests were administered to all students in this project. Using the 3-A-Day of Dairy recall, the following results were found:

- 16% increase in daily consumption of milk
- 19% increase in daily consumption of cheese
- 12% increase in daily consumption of yogurt
- Overall, the students had a 17% increase in dairy consumption per their 3-A-Day of Dairy Recall.
- 43% increase in students who reported that they are consuming at least three servings of dairy daily.

These outcomes represent an important improvement in the dairy consumption of students. As mentioned earlier, this will help the students in developing optimal peak bone mass and to preserve bone mass throughout life.

Scope of Impact: State Specific

Source of Funding: 3-A-Day of Dairy Nutrition Education Grant provided by Dairy Max

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CSREES Goal 4: Greater harmony between agriculture and the environment

Overview

Oklahoma key program components contributing to this goal include: Integrated Pest Management (IPM), water quality, animal waste management, pesticide applicator training, pesticide impact assessment, natural resource stewardship, and sustainable agriculture. This goal contains many programs that are highly integrated with programs included in other goals, particularly goals 1 and 2. In the Oklahoma 5-year plan of work, IPM programs, for example, were included in goal 1, yet most are here-in reported under this goal because of the theme designations established by CSREES. During the year, 1,433 demonstrations, meetings, and conferences were conducted under this goal. These activities were attended by 11,588 participants during the year. OCES personnel conducted 4,730 visits and consultations related to this goal. Special efforts were continued this year to reach more minority producers resulting in 21.9% of the participants representing minorities. This represents an increase in percentage and numbers reached each of the last two years.

Poultry Waste Management Education provided 80.5 hours of education resulting in over 1,696 poultry producers, waste handlers, and waste applicators receiving at least three hours of continuing education to maintain certification in waste management in 2004 (140 of the applicators and new growers received the nine-hour initial training). This certification is mandatory for producers to continue in business. One result of the education is that soil nutrient testing and litter nutrient testing has increased threefold. The number of poultry producers keeping litter application records has increased from 34% in 1997 to over 92% and those using litter storage facilities tripled since the education programs began four years ago. In addition, the amount of litter moved from watersheds and marketed through the OCES sponsored litter marketing website has increased significantly. Pre and post testing indicates that significant improvements in the producers' understanding of key principals such as: relationship between soil-test P and runoff P (75%), how riparian buffers work and why they are important (90%), and the appropriate depth to take soils samples (75%).

The Eucha/Spavinaw Creek Watershed Project is a program related to the poultry waste management program as it works with producers and others in one of the more intense nutrient – poultry producing watersheds in Oklahoma and Arkansas. In partnership with the Oklahoma Conservation Commission, OCES has developed a BMP demonstration farm. In FY2005, 120 poultry producers toured the farm to understand BMPs related to riparian areas and forage management. In addition, extension educators are helping producers write grazing plans. These plans have helped producers raise income by $39 per cow, while reducing off-farm hay and nitrogen fertilizer inputs. These results have helped the acceptance to BMPs showcased at the demonstration farm.

Integrated pest management (IPM) and related pest management teams exist for wheat, alfalfa, soybeans and peanuts, greenhouse and horticulture products, pecans, cotton, grapes, and vegetables. These teams are very active and many of their programs are truly integrated between production and pest management practices. A related emphasis area is in pest applicator education and training. These areas work together on many programs.
The musk thistle biological control program continues to spread throughout the state and save property owners on their pastures. During FY2005 43,510 head weevils were collected and

released in 16 western Oklahoma counties. In addition, 9,990 rosette weevils were collected and released. In addition, numerous educational programs and sets of materials were completed for land owners in these counties. Results from previous releases in the northeast portion of the state have resulted in 80% to 95% decrease in thistle populations. In addition to saving costs of weevil acquisition, control results in spraying cost saving of approximately $3,400 per farm over a 10 year period. The OSU Pecan IPM Team continues to develop, refine and expand an educational opportunity for growers, extension educators and industry personnel. The Pecan Short Course has continued to build on the previous year's success stories to reach and even challenge the growers of Oklahoma in adopting IPM principles. Over the past six years the pecan IPM team has educated and trained over 340 growers, extension educators and homeowners on best management practices related to pecan. The primary direction of these classes was centered on totally integrating the separate disciplines into a concise, hands-on program of instruction for persons interested in pecan production.

As mentioned, IPM programs comprise a significant role in education and information provided each year. The Oklahoma Cotton Sentry (part of the statewide entomological information system) is a weekly source of entomological information for cotton producers. It is sent in email and mail formats and additional information is found at the Cotton Sentry website. Application of appropriate IPM scouting combined with the information from Cotton Sentry and application of modern technologies have helped improve cotton returns about $8 per year per acre. That translates to $750,000 per year in the state. The Areawide Pest Management for Wheat project is in its fourth year, and is a cooperative effort across 6 states (OK, TX, CO, WY, NE, KS); more information is available at http://www.pswcrl.ars.usda.gov/awpm.htm. The Greenbug Pest Management Decision Support System is online at http://www.pswcrl.ars.usda.gov/gbweb/index.htm. It contains extensive information on aphid ID, state-specific economic threshold determinations, labeled insecticides, and natural enemies. Also recently developed (and available at this same site) is the Glance ‘N Go sequential sampling program. This sampling strategy is based on a presence/absence method of determining aphid-infested tillers, which is a significant improvement over the previous sampling method of counting aphids. Economic thresholds are determined in advance, and specific for fall or spring winter wheat; a producer would need to sample no more than 90 tillers to make a treatment decision. This sampling protocol now incorporates specific rates of parasitism as well, to further assist producers on effectively and economically controlled greenbug on wheat. For each of the past seven years, another IPM program, Statewide Alfalfa Email Advisory, has helped to reduce the number of insecticide applications for weevils and aphids on alfalfa from 2.0 to less than 1.1 annually. This results in a $4.1 million cost saving to farmers and a 40% reduction in pesticide applied.

Ecosystem restoration of native prairies, shrublands and forests was begun 17 years ago. Through education and demonstration on application of prescribe fire, Extension has increased the number of acres burned (prescribed) to approximately over 1.5 million acres improving water quality, habitat for several declining species and economically important species and beef cattle. This has resulted in improved habitat for two endangered species and several economically important species. In the last six years, seventeen prescribed burn associations made up of ranchers and small land owners have formed to facilitate restoration. During FY2005, the associations conducted 50 prescribed fires impacting over 15,000 acres. In addition, municipal governments continue to endorse this program and have begun to implement the “Firewise Program” to reduce

wildland fuel as they try to prevent loss of life and property from wildfires in the wildland-urban interface.

Pesticide Applicator Education efforts resulted in over 2,500 applicators taught proper pesticide delivery methods. Education also helped reduce the amount of phosphide fumigants used while improving the safety of their use. Education for Oklahoma Department of Transportation Pesticide Applicators resulted in a 81% reduction in the use of atrazine in eight years as well as a cost saving for state and local governments.

Positive progress was made in all Key Program Components listed under this goal in the Oklahoma Cooperative Extension Service 5-year plan of work. Total expenditures represented by programming and related support for this goal are approximately $3.4 million with $1.1 million from Smith Lever funds. About 20 professional and paraprofessional FTEs contributed to the goal last year. Following are some example program impact statements arranged by CSREES Key Theme.

Impact Statements Goal 4

Key Theme – Agricultural Waste Management

Title: Poultry Waste Management Education Program

Issue:
In 1998, the State of Oklahoma mandated that Oklahoma Cooperative Extension Service train all contract poultry producers and poultry litter applicators in the management and beneficial utilization of poultry waste to protect the environment. This came about in response to concern about non-point source pollution affecting the high quality water resources of Eastern Oklahoma. Currently, this education program affects some 700 poultry farms in Oklahoma with a capacity of up to 300 million birds per year, and the application of 115,000 tons of poultry waste annually.

What Has Been Done:
By state law every poultry grower must take an initial nine-hour series of Poultry Waste Management (PWM) educational sessions covering: regulations, animal waste management plans (AWMP); nutrient management; sampling and calibration procedures, conservation BMPs and poultry litter marketing. In fiscal ’05, 163 new Oklahoma growers and applicators completed their initial nine hours at 6 different locations, and received completion certificates. A total of 1,714 people have received such certificates since the program began in 1998.
Growers and applicators must also choose three annual hours of Update Education from a variety of offerings given in counties throughout Eastern Oklahoma. Annual Update Education offerings totaled 80.5 hours in fiscal ’05. A total of 1,696 growers or applicators attended one or more of these sessions, and 4,982 person-hours of Update Education were recorded for the year. This represents a significant increase over the previous year, when 1,210 participants logged 3,469 hours of education.

The 2005 year's Update Education offerings placed new emphasis on hands-on education, outdoor tours, and litter marketing. Sessions such as Poultry Farm Pond Management and Streambank and Riparian Area Management provided first-hand experience to reinforce understanding of environmental impacts of agriculture, particularly in the areas of nutrient runoff and effects of grazing on sensitive areas. Emphasis was placed on long-term economic and environmental benefits of improved stewardship. The annual Litter Marketing Conference attracted over 100 producers and applicators. A Rules and Regulations course was designed specifically for minority Laotian and Mong growers, who have significant communications barriers.

Impact:
In 2004 soil nutrient testing and litter nutrient testing increased 79% over previous years. The number of poultry producers keeping litter application records increased from 34% in 1997 to over 92%, and those using litter storage facilities tripled since the education program began in 1998.

In 2004/05 transfers of poultry litter increased substantially. About 140 of the 163 people completing the first 9 hours of PWM education were Private and Commercial Waste Applicators. In the same period, 82 poultry producers listed over 15,000 tons of litter for sale on the OK-Littermarket website, and since the website was revamped in 2003, almost 30,000 "hits" have been logged on the Buyers' list, where poultry producers and applicators would most likely be searching for litter buyers.

Testing at a November 2005 PWM education event showed a remarkable knowledge level among attendees. Ninety percent understood that riparian buffers remove pollutants from runoff, 75% knew the correct depth from which to take soil samples, and 75% understood the relationship between soil test P-index and runoff P. When asked to rate their knowledge of BMPs, almost one-half rated their knowledge as "good" or "excellent". Attendees reported using BMPs as shown below:

Soil testing every other year	92%
Collect at least 20 soil cores/sample	65%
Litter tested pre-application	89%
Phosphorous based litter application	65%
Fertilize according to soil test	92%
Rotational Grazing	54%
Cross Fencing	62%

Clearly these are encouraging results that we believe are attributable to Poultry Waste Management Education.

Source of Funding: State

Scope of Impact: Eastern region of state; poultry industry; Southern Region Extension Water Quality group

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Key Theme – Integrated Pest Management

Title: IPM Helps Oklahoma Landowners Fight Invasive Thistles

Issue:
Musk thistle (*Carduus nutans* L) was introduced into the eastern seaboard area of the US around 1853. Since its introduction, it has become a weed of considerable economic importance, especially in pasturelands. It reduces forage yields and forage quality by competing with the desirable forage plants for water, soil nutrients, and light. Musk thistle was first identified in Oklahoma in 1944, and by the end of 2001, 62 counties in Oklahoma reported musk thistle infestations. Infestations of musk thistle in improved pastures cause significant economic losses in Oklahoma. In 1998, Oklahoma legislators passed a law designating musk thistle, along with scotch and Canada thistles, as noxious weeds in all counties of the state. Based on a 1995 pasture survey, average acreage of improved pasture for each producer in Oklahoma ranged from 40 to 160, depending on location in the state. The average cost of controlling musk thistles for 10 years using herbicides would be $5,200 per producer. There are about 7.1 million acres of improved pastures in Oklahoma. Thus, the statewide cost of controlling musk thistle with herbicides for 10 years, if all improved pastures were infested, would be $461,500,000.

What Has Been Done:
An Oklahoma IPM musk thistle control program was developed in the early 1990s and has been implemented statewide through cooperative efforts of researchers, Extension personnel, and landowners. This integrated program focuses on increasing public awareness of the problem, development of educational information, demonstrating various control options, and introducing new biological control agents. Numerous demonstration and educational meetings were conducted in 2005 to landowners and NRCS employees. Extension educators and landowners collected approximately 43,510 musk thistle head weevils in Alfalfa, Craig, Grant, and Okfuskee Counties in the Spring of 2005; these were released into 16 counties, primarily in the western portion of the state. In addition, 9,990 rosette weevils were also collected and released. Because of repeated annual releases in the north central portion of the state, we were able to sponsor weevil collections at these sites, decreasing travel time for western landowners. To date, this program released 690,060 musk thistle head weevils and 28,910 musk thistle rosette weevils across the state. Detailed establishment and impact of the thistle head weevil and rosette weevil in Oklahoma were documented in a Masters thesis published in 2001, and one paper has been published in the scientific journal *American Entomologist*. A Web site was developed and maintained for OCES use, at http://ipm.okstate.edu/ipm/weeds/muskthistle.html; this site contains downloadable versions of current fact sheets and reports, PowerPoint presentations, and current information on thistle round-up activities (such as maps, directions, what to bring, etc.). PowerPoint presentations (as slide sets) on integrated management of thistle are available in each District office, to assist county and area Extension educators to conduct local programming on

thistle management. A fact sheet on the management of invasive thistles (F-7318), including musk thistle, is available to both OCES and landowners. A poster on invasive weed identification and management was developed and used at several Extension workshops. The following publications were distributed in 2005: a set of instructions (with color pictures) to accompany weevil release cups, a brochure on thistle management throughout the year, the fact sheet, and "weevil cards," constructed of actual rosette and head weevils. IPM, Water Quality, NRCS, and the state Dept. of Agriculture continued to distribute the durable metal signs to designate where weevils were released, which was produced last year. As in 2002, one sign was given to participating landowners free of charge, with additional signs available for purchase.

Impact:
Landowners in NE Oklahoma have noted from 80% to 95 % decrease in number of musk thistle plants in areas where they are using an integrated approach that includes use of the musk thistle weevils. Head weevils were found on over 80% of the musk thistles checked in northeastern Oklahoma. Many landowners became concerned about controlling musk thistle after the 1998 "Thistle Law." Significant cost saving is possible when musk thistle weevils are integrated into musk thistle management systems. Spraying of pastures could be phased out after a couple of years and no annual border spraying would be required. Cost associated with an integrated approach using weevils would be $1,600 for spraying and $200 associated with trips to collect 500 weevils (though Extension educators have collected weevils and provided them at no cost to many producers). This represents an average savings of at least $3,400 per producer over the first 10 years. In addition, if the typical landowner applies 1 lb active ingredient of herbicides per acre annually, biological control has decreased the amount of herbicides applied to the environment by 7.1 million lbs per year. By making landowners aware of damaging effects of musk thistle, it is expected that they will become more involved in control and preventing spread of all invasive weeds.

Funding: Smith Lever; State

Scope of Impact: State Specific

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Title: Providing Essential Entomological and Production Information to Enhance Cotton Insect Control Decisions in Oklahoma

Issue:
A statewide network highlighting Extension Entomology activities has evolved to provide pertinent information to the cotton industry. Keeping agri-business, consultants, and cotton

producers informed of insect pest trends (surveillance), control strategies, applied entomological research results (local and regional), and growing degree accumulations (collected by Mesonet, Oklahoma's statewide, automated weather system) throughout the growing season helps adjust management strategies unique to each production region of the State – Southwest, West Central, Northern and the Panhandle. Adjusting control strategies to individual production schemes reduces environmental concerns while increasing profitability through efficient insect control.

What Has Been Done:
The challenge is to keep pace with the expanding cotton acreage across the state. To help meet this need, the Cotton Sentry (a weekly insect newsletter) is available in two formats – electronic and mail. It is delivered to interested persons throughout Oklahoma, Kansas, and Texas. Current entomological information and past Cotton Sentry issues are available at www.osu.altus.ok.us. Annually a Southwest Oklahoma Entomology Report is published highlighting entomological activities. Key field surveys are also conducted to determine population trends and pest status across the state. *Bt* technology (transgenic cotton) has been the focus of the applied research conducted. Regional turn-row tour and scouting workshops are held at key points throughout the growing season for hands-on training of scouting procedures and plant mapping techniques to enhance producers' and consultants' knowledge of IPM strategies.

Impact:
This educational network continues to provide key entomological information strengthening the foundation for cotton IPM across the state. The Cotton Sentry subscription list has steadily increased since its inception in 1990. In 2004, 80% of the subscribers (177) received the Cotton Sentry electronically compared to 20% of the subscribers (43) preferring the mail edition. Reducing insecticide usage is extremely difficult with an active boll weevil eradication program underway. However with the introduction *Bt* technology in 1996, insecticide applications have dropped sharply. A consultant's survey conducted in the fall of 1999 revealed that conventional cotton managed the same as *Bt* cotton received 3.7 more insecticide applications per season between 1996 and 1999. *Bt* cotton continues to be very popular in Oklahoma. *Bt* cotton represented 40% of the cotton acreage (or approximately 91,000 acres) in 2005. Growing *Bt1* varieties was worth $ 247.28 per acre and *Bt2* was worth $ 337.93 (*Bt2* was used in the 10 year comparison) in 2005. Since its introduction in 1996, this research indicates that the value of investing in *Bt* transgenic technology between 1996 – 2005 was $ 82.54 per acre (weighted average) or $ 43,462,592 (B*t* acreage = 526,564 acres for 10 years).

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Key Theme – Natural Resources Management

Title: Roger Mills County Outdoor Classroom

Issue:
In 1992, the 4-H Youth Development Program Advisory Council identified the need to provide conservation programs for youth. This was a time when recycling solid waste and water conservation were priority issues for people statewide. The PAC decided that the best way to educate adults was to first teach youth and encourage them to share what they learned with the significant adults in their lives.

What Has Been Done:
The Extension staff made contact with the Natural Resource Conservation Service and a partnership was formed. These two agencies established a common goal of establishing an outdoor classroom for third grade students in our county.

The partnership between NRCS and Extension has conducted an annual outdoor classroom experience for youth for 11 years and shows no sign of ending. It has survived personnel changes, funding challenges and stormy weather. At least 10 state agencies besides the original partners are involved in the outdoor classroom each year. The students rotate from one workshop to another every 20 minutes throughout the day. They are exposed to subjects related to recycling, water conservation, animal tracking, wildlife identification and conservation, identification of soil types, soil conservation practices, natural resource management, water pollution, career opportunities, etc.

Impact:
We have reached about 2,403 third grade students with the help of 625 adult volunteers over the past 12 years. The program has expanded to include schools from Beckham, Washita and Dewey Counties along with the Roger Mills County students. As the students enter high school, they often contact the Extension office for resource information when they are writing research papers. They remember a hands-on activity from their third grade outdoor classroom experience and want to know about a certain subject now that they are capable of handling more knowledge.

As a result of conducting the annual outdoor classroom, a Wetland Outdoor Classroom Advisory Committee was established several years ago. We wrote and received a Learn and Serve America grant that started the construction of a permanent wetlands outdoor classroom. We have numerous partners on this project with well over $150,000 dollars invested in the classroom. It is a very involved project with completion expected by 2005. It will completely be handicapped accessible and the only classroom of its kind in Western Oklahoma and the Texas Panhandle.

Funding Source(s): State; Smith-Lever

Scope of Impact: State Specific

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Key Theme – Pesticide Application

Title: Continuing Education Helps the Oklahoma Department of Transportation Manage Roadside Cost Effectively

Issue:
Oklahoma Department of Transportation (ODOT) employees are responsible for vegetation management on over 230,000 acres of interstate and state highway rights-of-way in Oklahoma. Part of this acreage is the I-35 International Trade Corridor. Proper management results in vegetation that is attractive as well as functional in stabilizing the road surface against soil erosion and providing maximum visibility for millions of motorists. The natural process of ecological succession results in the colonization of the roadside by some undesirable plants (weeds) that do not offer adequate soil stabilization or maximum visibility for the motorist. Unmanaged weedy roadsides can also serve as a refuge for reinfestation into adjacent private lands. Some of these weeds can be state Noxious Weeds or Federally listed Invasive Species. ODOT employees require continuing education as well as consulting expertise regarding the most cost effective vegetation management and weed control strategies. ODOT vegetation managers must not only maintain Oklahoma Pesticide Applicator Certification (PAC) status but also Equipment Competency Certification (ECC) status within ODOT.

What Has Been Done:
New ODOT roadside vegetation managers obtained an 81% pass rate in 2005 on PAC exams and have been provided continuing training to maintain PAC and ECC status. They have been trained and counseled on weed identification, spray equipment selection, equipment trouble-shooting/calibration, herbicide selection and use, as well as identification of environmentally sensitive areas. Ten hands-on calibration workshops were conducted in 2005 where applicators brought their own equipment for calibration. In 2005 the ODOT adopted an "Approved Herbicide & Adjuvant Bid List" developed by our program. Under this policy, these are the only herbicide and adjuvant products which ODOT will purchase and use as they have been thoroughly researched and found to be effective under normal expected conditions by OSU when used according to Federal and State label directions. A final draft of the 3rd Edition of the Oklahoma Roadside Vegetation Management Guidelines was developed in 2005 and will be distributed to ODOT field staff in early 2006. A final draft of a color pictorial guide to solving common roadside vegetation management problems was developed by our team and approved for use by ODOT in 2005. New weed control suggestions were developed and implemented through internet-based current reports in 2005. Roadside equipment inventory status and herbicide use surveys were conducted again in 2005 to track trends.

Impact:

Fifty-five ODOT personnel received pesticide applicator certification training in 2005 with 540 pesticide applicators receiving continuing education in 14 workshops in 8 locations across Oklahoma. Roadside acreage in Oklahoma treated with atrazine, a Restricted Use pesticide, was reduced from 35,936 acres in 1997 to 6,788 acres in 2005 (81% reduction). Total roadside acreage treated with herbicides has declined from 100,817 acres in 1999 to 98,556 acres in 2005 (2.2% reduction). Training directly resulted in ODOT atrazine use being gradually replaced with a General Use classified glyphosate + 2,4-D tank mix or similar combination. By late 2005 the Special Local Need (SLN) permit for Atrazine use on Oklahoma roadsides was withdrawn since use had fallen to very low levels. Newer treatments pose less environmental risk. Improved weed control also resulted, and in some instances an additional mowing was eliminated that would have cost at least $18.00 per acre compared with an herbicide cost of less than $7.00 per acre. During the bid process, we provided industry sales representatives and ODOT buyers with cost-benefit analysis information regarding generic herbicide products. This resulted in an additional bid-price reduction for herbicides that saved ODOT an estimated $60,000 per year over 2001 figures. ODOT purchased 3 precision-agriculture sprayers (PAS) since 2000 as a direct result of an "on-loan" PAS demo conducted by OSU roadside program personnel. These PAS allow for less herbicide use in vegetation encroachment control on asphalt shoulders. We developed "no spray zones" on maps for ODOT where pesticide applicators no longer treat so as to protect surface water resources. We alerted ODOT managers as well to the location of herbicide sensitive specialty crops on adjacent private lands. Clear zones on the roadsides contain equally healthy turf as before, which provides better pavement and shoulder stability. With fewer tall weeds comes improved visibility and thus safety for the motorist. The PAC and ECC training programs result in better performing ODOT employees and a measurable performance parameter that allows ODOT field workers opportunities for salary improvements due to increased knowledge and skills gained.

Funding Source(s): State; Smith-Lever

Scope of Impact: State Specific; Integrated Research and Extension

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Title: Pesticide Safety Education Program

Issue:
In the state of Oklahoma, all commercial pesticide applicators are required to be certified with the Oklahoma Department of Agriculture, Food & Forestry. Other applicators must be certified only if they use Restricted Use Pesticides or if they use pesticides that require certification for sale of

the product. The certification process, combined with the regulatory changes occurring at the federal and state level, necessitate information transfer.

What Has Been Done:
PSEP cooperates closely with ODAFF on pesticide certification. PSEP focuses on the major categories in the state (Agriculture Plant, General Pest, Structural, Private Applicators and Service Technicians). The two other major certification categories (Right-of-Way and Ornamental & Turf) are serviced by Horticulture Department personnel.

OSU PSEP held recertification programs for applicators Fumigation in 2005-2006. PSEP also conducted programs for Ornamental & Turf and General Pest applicators.

OSU PSEP continues to work with other states on grain fumigation certification. OSU PSEP assisted Missouri with its certification and recertification programming in 2004-2005.

OSU PSEP in cooperation with ODAFF conducts practicals in the Structural, General Pest and Fumigation categories. All these practicals are held at OSU Stillwater. The Structural and General Pest are held at the Pinkston Education Facility. The General Pest practical also has the Food & Agricultural Products Research & Technology Center cooperating in the program. The fumigation practical is held at the Stored Product Research & Education Center.

Impact:
Over 1,000 applicators were certified by the above programming and education efforts. The practicals are the primary source of information for regulatory requirements as these individuals go into business.

Funding: USDA-CSREES; ODAFF; Oklahoma Pest Control Association; and industry support

Scope of Impact: We have shared our fumigation information with the states of Kansas, Minnesota, Nebraska, Ohio, Missouri, South Dakota, and Texas.

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Title: Oklahoma IR-4 Program

Issue:

Oklahoma minor crop do not have many crop protection options in their tool box. Oklahoma IR-4 works with the National IR-4 program in finding and getting new crop protection chemicals for minor use crops.

What Has Been Done:
Oklahoma works with IR-4 Programs in Texas and Arkansas to secure new needs for minor use crops. Oklahoma works closely with these states since their minor use crop needs are very similar to Oklahoma. Oklahoma IR-4 attends growers meetings and meets with specialists on what to submit for Oklahoma IR-4 needs.

Impacts:
Oklahoma IR-4 is keeping abreast of the impact of soybean rust on minor legume crops such as snapbeans and southern peas. Oklahoma IR-4 submitted 25 Pesticide Clearance Requests to IR-4 headquarters for Oklahoma crops. Multi state cooperation occurs again with Texas, Arkansas, and other states in the Southern Region such as Tennessee for Processing greens and Georgia for Pecans.

Funding Source(s): USDA-CSREES

Scope of Impact: Multi-state southern region (Oklahoma, Texas, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, North Carolina, South Carolina, Florida, Kentucky, and Virginia.)

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Title: Oklahoma Pest Management Network

Issue:
Providing pest management information for Oklahoma to USDA and EPA for pesticide registrations, and other pest issues. Also the Oklahoma Pest Management Networks provides a way for Oklahoma growers to provide input USDA and EPA on pesticide issues.

What Has Been Done:
Oklahoma Pest Management Network is part of the Southern Region Integrated Pest Management Center. OPMN attends Southern Region IPM Center meetings to provide Oklahoma information and stay in touch with pest issues that might affect Oklahoma growers. OPMN meets with many different stakeholder groups to determine their needs and help convey those needs to USDA and EPA. A web site has been put up to provide growers and university personal with information on

EPA regulatory issues such as pesticide registrations. Also OPMN provides the Southern Region IPM Centers with crop profiles and pest management strategic plans which are used by USDA and EPA for pesticide registrations concerning issues in Oklahoma.

Impacts:
Oklahoma provided to the Southern Region IPM Center information on aldicarb (Temik) use in Oklahoma to support re-registration of this pesticide on cotton, peanuts, soybeans and other crops. Oklahoma also provided the Southern Region IPM Center information regarding copper fungicide use in Oklahoma to support re-registration on Oklahoma crops. Information regarding soybean rust is relayed through USDA and is communicated through this program. Peanut and cattle crop profiles were completed and will be submitted in early 2006. A web site for growers and University personal to keep track of regulatory issues affecting pest management has been developed and can be found at http:// pested.okstate.edu.

Funding Source(s): USDA-CSREES

Scope of Impact: multi-state southern region (Oklahoma, Texas, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, North Carolina, South Carolina, Florida, Kentucky, and Virginia.)

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Key Theme - Recycling

Title: Oklahoma Pesticide Container Recycling Program

Issue:
Unrinsed empty pesticide containers cannot be disposed in sanitary land fills, buried, or burned. These dirty containers can be hazardous waste. Empty pesticide containers that are rinsed properly cannot by used for any purpose and must be recycled or disposed of in a landfill. This program promotes producers and users of pesticides to first rinse there containers properly to prevent them from being considered hazard waste and a detriment to the environment. This program promotes the more environmentally sound practice of recycling to keep the containers out of the landfill.

What Has Been Done:
Each year OSU PSEP in conjunction with participating counties holds one day collections for farmer and ranchers to recycle their clean containers. Also OSU PSEP coordinates with USAG Recycling what businesses need their containers picked up. OSU PSEP promotes this program at

numerous trade shows and meetings throughout the year. Educational programs are also given to promote this program to interested parties to promote this environmentally friendly program.

Impacts:
For 2005 throughout the state of Oklahoma, containers were collected in 20 counties with 9 County Educator held sites for farmer & ranchers. 2005 – A total of 60,777 plastic containers were collected with a less than 1% rejection rate. 85,320 pounds of solid waste were recycled and kept from the landfill with this program.

Funding Source(s): State (ODAFF), and PSEP

Scope of Impact: State Specific

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Key Theme – Water Quality

Title: Lake Eucha/Spavinaw Creek Watershed Education Project

Issue:
Since the late 90's the state of Oklahoma has documented excessive nutrient loading - especially phosphorus (P) - to Spavinaw Creek and consequent eutrophication of Lake Eucha. Eutrophication is marked by excess algae growth and water quality declines. The problem is viewed as threatening the drinking water of the Cities of Tulsa and Jay. Taste and odor problems have become common in this drinking water, greatly increasing Tulsa's water treatment costs in recent years.

The Eucha/Spavinaw watershed is shared between Oklahoma and Arkansas. One major non-point source of nutrients on both sides of the state line is poultry litter applied to pastures, often in excess of forage requirements. Livestock overgrazing and unlimited access to streams are also major pollutant sources. Riparian degradation is implicated in loss of aquatic and terrestrial habitat, as well as excess sediment delivery to water bodies

The settlement from the legal battles between the City of Tulsa and the poultry integrators is limiting the amount of litter that can be applied within the watershed. However, education is required to promote compliance with the new rules, to control other sources of P, and address overgrazing of pastures and riparian areas, and utilization of excess P in soils with high soil test P.

What Has Been Done:
The Lake Eucha/Spavinaw Creek Watershed Education Project has the developed the Water Quality BMP Demonstration Farm, showcasing practices designed to increase efficiency of agricultural production while protecting the environment. Through a cooperative agreement with a local rancher, this 196-acre farm on Brush Creek (a Spavinaw Creek tributary) has become an outdoor classroom for area producers, enabling them to witness first-hand the implementation and monitoring of BMPs.

Installed BMPs include riparian area establishment with alternate water sources, stream crossing stabilization, waste storage/animal feeding facilities with near-by heavy-use areas, proper waste utilization and pasture management. Pasture management includes matching forage type to soil and terrain, lowering nitrogen fertilizer requirements and rotational grazing. In addition, natural rainfall runoff from eight bermed mini-watersheds at the Demo Farm and two other watershed farms is being monitored. This study will evaluate the effects of different land use options on the quality of runoff water.

OSU Extension Educators and their Project partners from the Oklahoma Conservation Commission (OCC) have access to the farm as needed for management of installed practices and for tours and demonstrations. To date, 120 people have toured the demonstration farm, including a forestry tour and a forage management/riparian tour for local poultry farmers in the Fall of 2005. Four similar tours per year are planned for 2006 and 2007.

Extension Educators are writing 15 grazing plans for cooperators in the Spavinaw Watershed. When implemented, the plans will utilize soil, water and fertility resources more efficiently and better account for seasonal variability of forage production, compared to common current practices.

A youth education component includes an annual summer Water Quality Camp held in the Demo Farm's riparian area. The 2005 camp was attended by 25 youth and 6 parent volunteers.

Finally, the project considers Arkansas landowners an integral part of the intended audience. County staff of the University of Arkansas Cooperative Extension Service have become familiar with the project and participate as educators on tours. Project activities will continue to be promoted across the state line.

Impacts:
Concurrent with the Education Project, the Spavinaw Creek Watershed Implementation Project operated by OCC with EPA 319 funding, cost-shares the implementation of BMPs by farmers in the watershed. Numerous farms have applied for cost shares, and the number is expected to increase greatly as local producers become familiar with the Demonstration Farm. The relationship between OCC and OSU Cooperative Extension has been especially constructive in this effort, and will hopefully set a new standard for cooperative watershed projects in Oklahoma.

Grazing plans written by Extension Educators have shown the potential to increase income to ranchers by as much as $34 per acre and $39 per cow, while significantly reducing off-farm hay and nitrogen fertilizer inputs, as well as the risk of damage from overgrazing. On a typical 350

acre ranch, these income benefits could total up to $10,000 per year, greatly enhancing the likelihood of adoption of BMPs.

Increased implementation of these and other BMPs will bring about reductions in overall nutrient inputs and in total acreage of overgrazed areas, as well as increases in riparian habitat area and protection. These represent significant water quality benefits to the Lake Eucha/Spavinaw Creek watershed.

Source of Funding: State; EPA (section 319)

Scope of Impact: Statewide, and bi-state with Arkansas; Southern Region Extension

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

Overview

Oklahoma key program components contributing to this goal include: community economic, small business and tourism development; community infrastructure, service and facilities; local government education; applications engineers; family economic well-being; family resiliency; parenting; leadership development (youth and adult); life skill development; and club organizational development. The theme categories in this goal represent several programs that should have been included in CSREES goal 1, such as, "Agricultural Financial Management". Thus some reporting discontinuities may exist between what is reported in the overview and under key themes. During the year, 16,002 demonstrations, meetings and conferences (including 9,390 for 4-H and youth programs) were conducted under this goal. OCES personnel conducted an additional, 95,677 visits and consultations. These activities were attended by 837,478 participants during the year (including 523,788 participants attending youth activities). Approximately 23.3% of the attendees of programs under this goal represented non-white audiences. These figures might be compared to 26.0% in the general population of Oklahoma. Several programs contributing to this goal train and use large contingents of volunteers. Volunteers contributed over 11,482 days during the year to support and help deliver programs under this goal. Programs in this goal also have a very large number of person-contacts through mass media, such as television, radio and newspapers. In addition, over 23 million person-contacts occurred through mass media educational programming under this goal in 2005.

Educational and service programming under this goal really fall into four major areas. The first is the area related to community development, local leadership development, infrastructure, government and economic development. These all represent rapidly growing areas of OCES requests and effort. Particularly high demand has been experienced in rural medical service, economic development, and through the applications engineers program. The latter is a joint program with the College of Engineering. It places masters-level engineers strategically around the state through Cooperative Extension offices. These applications engineers work with small to mid-sized manufacturing companies in rural communities to solve production, expansion and efficiency questions. This program and the rural community health services programs have been significant shifts in emphasis over the last six years. And these programs continue to grow. The other three major program areas under this goal are very high contact programs. Particularly high contacts are the consumer horticulture, home gardening efforts and the youth leadership and life skills programs. These programs result in a huge number of direct contacts every year - both in urban and non-urban communities. In order to better meet demand, OCES conducts a large Master Gardener program as well as a weekly "Oklahoma Gardening" television show. Also, the youth life skill development and leadership programs and Master Gardener program develop most of the large volunteer effort mentioned above.

The Applications Engineers program served more than 87, mostly rural, manufacturers that employ more than 3,800 citizens. The engineering assistance in the client projects resulted in over $6.9 million of increased sales for these firms and another $3.4 million which would have been lost to the local economy due to relocation. In addition, the applications engineering program documented 36 new jobs created from assistance and 50 jobs retained. This program showed a total net impact to the state economy in excess of $22 million in 2005.

The Healthy Communities initiative unifies many of our existing programs as well as several new efforts. This initiative centers on community infrastructure, community economic development, and community leadership development. For example in addition to community service studies in health care, waste disposal and community transportation, eleven studies were done analyzing retail trade, five studies on mainstreet and business and industry impact, and four communities received economic regional analysis studies. During 2005, the Initiative for the Future of Rural Oklahoma (IFRO) continued to develop local community leadership as well as provide local projects in economic development. This program included 13 well-funded pilot projects in 17 counties. To date the IFRO program has resulted in a community-wide tourism project, significant county economic development strategic planning, leadership classes, an airport improvement project, a community primary care facility, a community marketing videotape, several training programs including Oklahoma Pride, a new economic development authority, value-added merchandising and home-based business projects, an USDA grant on value-added project planning and development, and three websites developed. In addition, economic development assistance and strategic planning has been provided to communities through several methods including training, technical assistance, and collaboration/cooperation with other agencies and groups.

Programs related to agricultural business management remained strong. The Federal and State Taxation Education program provided sixteen hours of continuing professional education for 2,400 CPAs, attorneys, and tax professionals. These individuals prepare between 90% and 95% of

the farm tax returns filed by Oklahomans. OCES continues to provide individual farm business financial planning and management assistance through the IFMAPS program and group record accounting through its Quicken workshops. In addition, IFMAPS continues to support the Oklahoma Agricultural Mediation Program for farm business analysis assistance.

Elected county officers have a direct impact on a local economy via the public services provided, such as county roads and rural law enforcement. It is well established that the quality and quantity of public services impacts the economic vitality of a community. However, prerequisites for holding elected office are few and many officials find themselves unaware and unprepared to execute all required duties. OCES provides training and resources to equip county officers provide better quality and quantity of public services. In 2005, officers from 69 of Oklahoma's 77 counties attended 75 courses. The courses averaged 22 persons per course or approx. 8,300 credit hours of instruction. In 2005, 61 people completed certifications. In addition, in-depth county officer handbooks and purchasing handbook are updated on a regular basis.

The OCES' Oklahoma Homebuyers Education program has trained 217 homebuyer educators providing representation in all of the state's 77 counties. These trainers trained over 3,500 potential homebuyers in FY2005. Of those going through the training, 32.8% have actually bought homes (to date) with an estimated $59 million in homes sales in the state.

The 4-H Youth programs continue to serve and educate an enormous number of youth contacts. Over one hundred different club and after-school programs are available across the state. Listed below under the Key Theme Youth Development/4-H are just a few examples including: natural resources education, environmental stewardship, service learning, forestry and wildlife, literacy, youth entrepreneurship, and integrated pest management.

Positive progress was made in all Key Program Components listed under this goal in the Oklahoma Cooperative Extension Service 5-year plan of work. Total expenditures represented by programming and related support for this goal are approximately $17.3 million with $2.2 million from Smith Lever funds. About 174 professional and paraprofessional FTEs contributed to the goal last year. Following are some example program impact statements arranged by CSREES Key Theme.

Impact Statements Goal 5

Key Theme – Agricultural Financial Mangement

Title: Oklahoma Farm and Business Tax Schools

Issue:
Frequent changes in Federal and Oklahoma State Tax Laws create a need to keep tax preparers informed of the impact of the changes and how to best help their clients utilize the tax planning opportunities available. These tax schools are designed to update tax preparers about new laws and regulations covering farm, non-farm business and individual taxpayer issues.

What Has Been Done:

This program has been conducted for the past 44 years. It has grown from a one-day seminar to its present form of two days per location for the fall Farm and Business Tax Institutes and the summer Tax Clinic. This year was the first for our one day Special Topics Course. The combination of all the schools allows a preparer to get the full 40 hours of CPE/CLE as required by state. Topics covered range from presentation of new tax laws and their implications, agricultural issues, business issues, tax planning opportunities, professional ethics, retirement, and social security to name a few. Eleven sessions are conducted each year with two of these in the summer and nine in the fall and two one day special topics courses. Total 2004 attendance for the schools was approximately 2,400 tax preparers. Certified public accountants make up 47 percent of the attendance, 27 percent are tax preparers and bookkeepers, 8 percent are enrolled agents, 2 percent are attorneys, and the remaining 16 percent come from a variety of backgrounds. These tax preparers file between 90 and 95 percent of the farm returns for taxpayers in the state of Oklahoma.

Impact:
High quality, professional instruction is provided to make continuing education credit available for Certified Public Accountants, Enrolled Agents, and Tax Attorneys. Many of those attending have stated that they have been coming to these programs since they began. Participants file more than 26,087 Federal farm tax returns and 139,542 Federal non-farm tax returns as reported by the participants in the most recent program evaluations. Most of the tax preparers that attend are from Oklahoma however there have been preparers from Kansas, Texas, New Mexico, Arkansas, Florida, and California attending the program in order to maintain their Oklahoma accreditation.

Scope of Impact: State Specific

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Key Theme – Children, Youth, and Families at Risk

Title: HEALTHY FAMILIES: Support & Education for Families with Infants & Young Children

Issue:
In Oklahoma during fiscal year 2004, 12,347 allegations of child abuse and neglect were confirmed, half of which were under age six. Eighty percent involved neglect. An average of 40 children die due to maltreatment each year, over 72% of whom did not live to age two. More than 75% of abuse and neglect occurs in the hands of a child's own parents. The most active and significantly influenced brain development period is birth to age 3. Research indicates that home

visitation and parenting education and support services around the time of a baby's birth through early childhood reduces the risk of child abuse, and contributes to positive, healthy childrearing practices and family functioning.

What Has Been Done:
OCES implemented home visitation parent education programs in 1991 and launched the state's first Healthy Families America site in 1995. Program goals are to assess family strengths and needs, enhance family functioning, promote positive parent-child interaction, and promote healthy childhood growth and development. Families may enroll during pregnancy or around the time of a baby's birth, and may continue until the child is age five. Participation is voluntary. Services include home visitation, center-based education and support, and referrals to health care providers and other community resources.

In FY 2005, OCES Healthy Families programs served three counties: Canadian, Delaware, and Texas. During the year, 92 families with 107 children were provided 1,661 home visits and 174 parent education, support group, and family activity sessions. Also, 125 child development screenings were provided.

Impact:
Participant surveys indicate a high level of satisfaction with the helpfulness, service quality, and increased knowledge received. Previous evaluation of the programs suggests that first-time parents made significant increases in parenting knowledge, child development knowledge, and home safety practices, and the rate of second pregnancies for adolescent parents was 5% compared to the national rate of 25%. Other studies on Healthy Families programs suggest that enrolled families are 1/3 to 1/2 as likely to maltreat their children as comparable families not enrolled. Research suggests that prevention programs reduce the costs for intervention or remedial services such as health and mental health care, foster care, child welfare, juvenile facilities and special education.

Source of Funding: FY 2005 contracts totaling $313,261 were received from the Oklahoma State Department of Health, Child Abuse Prevention Fund, per state legislative appropriation. Collaboration with other community agencies is emphasized to better utilize scarce resources and provide a comprehensive array of services to effectively meet families' needs.
Scope of Impact: State Specific

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Key Theme – Community Development

Title: Economic Development Options and Opportunities

Issue:
Oklahoma is a diverse state. The Great Plains counties of the northwest have economies that are still heavily dependent on petroleum and agriculture. Population loss is a serious issue. The metropolitan counties in central and northeast Oklahoma, on the other hand, are growing faster than other regions of the state. Jobs are the biggest issue in the southeast part of the state, but this region is just starting to realize what a great asset their natural resources really are. People in this region have always been concerned about the environment, but now those concerns are mixed with thoughts bout how to effectively take advantage of tourism opportunities while still protecting the natural environment. The Northeastern counties have long understood the asset presented by their lakes and recreational areas. This region is dealing with large numbers of tourists and retirees. Every Oklahoma community faces a different set of issues and a different set of problems related to the development of the local community and the local economy

What Has Been Done:
Economic development assistance and strategic planning has been provided to communities through several methods including training, technical assistance, and collaboration/cooperation with other agencies and groups. The training involves distinct modules or topics such as tourism, retail trade, or strategic planning. A great deal of support material has been developed to aid in the training efforts. Much of the support material involves data reporting and analysis, computer model applications (impact analysis and retail trade studies), and use of other research based tools. This information includes three community specific reports: (1) economic and social data, including trends analysis, (2) a retail trade study, and (3) an impact analysis for the local economy. About 20 studies of these types have been prepared over the past year. The community specific information makes each workshop or technical report unique. The resulting strategy produced by the workshop reflects particular strengths and limitations of the community. Follow-up activities also vary, depending upon the needs of the community.

Impact: Specific economic development efforts during the past evaluation period include:
- Provided economic base studies for 4 communities or counties or regions.
- Provided 11 studies analyzing retail trade trends and sales gap analysis.
- Provided 5 studies analyzing topics such as mainstreet development, agribusiness, housing, impacts of manufacturing plants, and community surveys.
- Provided the PRIDE customer service training program to seven community groups.

Funding Source(s): State, Smith-Lever, Fees

Scope of Impact: State Specific

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Title: Community Working Together

Issue:
An administrator with the Environmental Protection Agency called water quality and quantity the biggest environmental issue we face in this century. We live in a nation where abundant, clear and cheap drinking water has been taken for granted for generations. Across the country, long-neglected mains and pipes, more than a century old, are reaching the end of their life span. Our aging water infrastructure needs new investment. The sense of urgency for Norman became even greater with the January 2006 EPA water quality standard changing the acceptable level of arsenic at the well head. As a result of this new standard, the city of Norman lost 15 wells that provided almost 40 percent of the water supply. As an enterprise fund operating without any general fund dollars or tax revenue, the community faced the challenge of funding new water wells and addressing its aging system.

What Has Been Done:
The mayor convened a group of 30 community leaders and city staff to study the water needs of the community. The result was to ask voters to consider a water rate increase March 7, 2006, and to launch an educational effort about water conservation. The community development educator facilitated the committee meetings and developed an educational plan on quality, quantity and conservation of water. The educator created presentation materials used by the speaker's bureau to reach 762 citizens through 22 meetings and events. She developed a water bill insert that was sent to more than 25,000 water customers in Norman and two educational printed pieces sent to 11,406 registered voters. During National Blue Ribbon Week, Feb. 20 – 24, 2006, the educator created a flier with information about water quality protection and conservation that was distributed through Thursday school folders to 8,500 elementary students.

Impact:
As the only city in Oklahoma where citizens must approve any type of water or utility rate increase, the educational issues were critical. It is a challenge to get the average citizen to vote in favor of higher rates or taxes. The Community Working Together committee truly believed the OSU extension office, with their access to research information and their communication resources, could accomplish two goals. They could educate the public about this environmental issue and create new revenue so city staff could meet the needs of this growing community. A year-long study will follow the election monitoring water usage and conservation education will continue. The local newspaper ran a series of educational articles and has committed to continue with this effort. The best result from this is that the water rate election was successful. The voters approved the rate increase with 56% "yes" votes. There is greater awareness in this community about the importance of quality water and the critical element of conservation.
Scope of Impact: State Specific

Funding Source(s): State and Smith Lever; City of Norman; Community Donors

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Title: Improving Access to Health Care Services in Rural Oklahoma

Issue:
Rural Oklahomans access to health care is vital for the quality of life rural Oklahomans deserve, however, most do not consider the impact rural hospitals and local health care providers have on the local economy and community development. The information provided through this process alerts community leaders to the importance of utilizing local health care services in order to maintain and/or expand access to those services in the future. Local leaders are also made aware of the difficulties of retaining retirees and recruiting industry if local health care services were not available. Rural hospitals are the emphasis of concern as they provide the foundation for the health care providers in the community.

What Has Been Done:
The Community Health Engagement Process begins by working with rural hospital to establish a committee to meet for a period of six to seven months. The initial stages of the process provide products that show the economic impact of the health sector, promote use of local services through a health services directory, provide data covering health, behavioral, traffic, crime, and education information, and a community assessment survey to determine local opinions and concerns with their health care services. Over the past ten years this process has helped sixty-eight communities state wide with products designed to improve access to local rural health care services. Many of those communities have gone on to establish "health care coalitions" to continue to address health care issues in their area and establish a plan of action for dealing with future goals. These coalitions are formed from local health care workers from a variety of facilities and local community members from all professions.

Impact:
Some rural hospitals and their communities have benefited by gaining tax support from their citizens. Other communities are able to increase awareness of local services and help change and improve those services. Examples include such things as health fairs and walking trails, as well as, kidney dialysis and outpatient rehabilitation centers. At times the impact is not truly realized until years later, for example when plans are put in place to raise money for the construction of a 1.8 million dollar wellness center in the panhandle.

Scope of Impact: County and community level due to maintaining and/or expanding health care services.

Source of Funding: State; Smith-Lever; and grant funding

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Key Theme – Family Resource Management

Title: Oklahoma Homebuyers Education

Issue:
Affordable housing is a major concern for all Americans. A recent survey sponsored by the Fannie Mae Foundation found that 41% of working families consider affordable housing to be a big or fairly big problem. Though the advent of private mortgage insurance and specialized funding and down payment assistance has expanded homebuying opportunities for many potential homebuyers, many still lack the requisite skills and information for maintaining homeownership. Foreclosures cost the lender, the community and the consumer. Homebuyer education can provide a means for assessing the suitability of a home purchase and provide an education in the kinds of financial basics that consumers need to take this step.

What Has Been Done:
Recognizing the need to develop standards in homebuyer education for traditionally underserved audiences, state agencies involved in providing services and education for homebuyers worked cooperatively to develop the Oklahoma Homebuyer Education Association. The organization has developed agreed-upon bylaws, curriculum, and certification standards for homebuyer educators and continuing education requirements for maintaining certification. Oklahoma Cooperative Extension Service has provided leadership and consultation throughout this process. Additionally, state faculty has assisted in providing the instruction for homebuyer educators' certification. County faculty have provided homebuyer educators on the county level as well as assisting with the training and peer evaluation of other homebuyer educators.

Impact:
The efforts of the organization and the volunteer trainers have resulted in training and certification of over 217 homebuyer educators providing representation in all 77 counties in Oklahoma. Over 3,500 participants are trained each year. The average cost of homes purchased by the homebuyers going through homebuyer education classes is $54,886 with 32.8% actually purchasing homes. The economic impact of Homebuyer Education through home purchases alone throughout the state is estimated to be $59,408,606.00. The Oklahoma Homebuyer Education Association has grown to include a membership of 185 individuals and agencies. Partners are pleased with the organization, the process, and the results. Oklahoma is one of only six states in the U.S. to implement a successful state model for standards in homebuyer education delivery.

Collaborating organizations, agencies, and teaching, research, extension partnerships:
Oklahoma Association of Community Action Agencies, various regional and local Community Action Agencies, Housing Authorities, Family Self Sufficiency coordinators, Tribal Authorities, Consumer Credit Counseling Services, many of the local banks, Federal Home Loan Bank of Topeka, and Fannie Mae.

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Key Theme – Farm Safety

Title: Environmental Stewardship

Issue:
Our natural resources are finite and must be protected. Teaching youth to make wise environmental decisions rather than re-train them as adults is the most effective way to help them become good stewards of the Environment.

What Has Been Done:
4-H Environmental Stewardship teams have been formed in 16 counties throughout Oklahoma. These clubs study environmental issues, conduct research and perform service learning projects in their communities. While team projects are as individual as the members and the geography around them, all teams receive training in well water testing and site assessment. During 2006, team members spent 2800 hours planning, conducting and evaluating environmental education programming and reached 11,191 youth and adults. In addition, volunteers contributed almost 3,000 hours to these projects. The market value of their time is almost $15,500.

Impact:
During the first half of this program year, teams of extension educators, youth and volunteers tested 67 wells in nine counties. Six homeowners requested bacteria tests and 21 full site assessments were conducted to evaluate the well's relationship to the house, septic lines, machinery storage, confined feeding runoff, etc. More than half of the well tests/site assessments conducted indicated that changes were in order, and where possible, those changes are being implemented. Examples include:

Problem Identified	Corrective Action
1. Chemicals stored in well house, chemicals mixed/containers rinsed near well	1. Chemicals moved to a safer location; mixing and rinsing occurs in another location away from the well.
2. Well head unprotected	2. One landowner poured a slab and built a well house; the other has plans to build a well house
3. Loose well cap	3. Owner replaced the cap so it would fit

These are common problems with relatively simple solutions – the concerns were noted and most owners were willing to take corrective action. Many well owners had never received educational material on how to maintain a well prior to the team's visit. A few wells were too close to the house, and the owners were not interested in drilling new wells just to increase the distance. One has indicated that updating the old septic system is in order, and plans to work on that during the next year.

Teams encourage additional testing when their basic tests indicate a potential problem. In one case, after youth conducted the tests, a sample was sent to the OSU water testing lab to confirm results. The property owner is about to construct a new home where the well will be the primary water source and he is installing a reverse osmosis system to combat the water problem first identified by one teams tests. Another homeowner learned she had e-coli in her well after submitting the bacteria test. She has since flushed her system, re-tested the water and has a safe drinking water as a result.

In areas where water testing has taken place, community interest in having youth come to their homes/farms to conduct the test and/or site assessment is growing. Youth on the teams are learning to work in partnership with adults, and communicate results with adults. Teams have partnered with NRCS, producer groups, and Oklahoma Home and Community Education Association members to locate wells and work on cooperative projects like outdoor classrooms. Teams are also establishing recycling programs in their communities, planting trees for conservation and beautification purposes, monitoring streams in cooperation with the Blue Thumb program and teaching school children about water quality and conservation by using ground flow models and OSU's Stream Trailer. One county team mapped 12 illegal dump sites using GPS technology, made written descriptions, took digital photos, created two power point presentations and conducted programs for elementary school students. A total of 25 youth spent almost 150 hours on this project completed in partnership with Great Plains RC&D.

Scope of Impact: State Specific

Source of Funding: Smith Lever

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Key Theme – Home-based Business Education

Title: Economic Development Through Micro, Home-Based and Family Businesses

Issue:
Enhancing the well being of individuals, families and communities through successful home-based and micro businesses. The number of people working at home grows annually by 5-10% (Link Resources, 1995). One reason for this growth is the economic situation (OCES, 1989, 1994, 1999). In Oklahoma, those economic reasons develop from our ranking of 43rd in individual per capita income and 36th in the number of people at or below poverty (2001 Statistical Abstract). Other reasons are: lifestyle changes, increased family time, being one's own boss, and entrepreneurship.

What Has Been Done:
Since 1985, OCES has recognized the growing trend of entrepreneurship through home-based and/or micro businesses. Through the statewide network of Extension Educators OCES provides written materials that help a business owner get started and market their product or service. Specific materials for specific needs are available. Numerous workshops on a wide variety of topics have been developed. One-on-one assistance is offered.

Impact:
- Based on a 2003 survey, 20% of households own and operate a business. 68% of those business are family owned and operated, 66% are home-based businesses, and 92% are micro (employing 10 people or less) in size. Averaging nearly $40,000 in gross income, these potentially 175,000 home-based businesses add $6 billion to Oklahoma's annual economy with family businesses generating a similar amount.
- 80% of businesses assisted by the program are still in business after four years.
- 30 new food-based businesses have started after participating in "Basic Training"
- In a 1998/99 survey, 28% of respondents have started a business. With an average income, this means over $1,500,000 annually has been added to local economies.

Funding: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Jobs/Employment

Title: Applications Engineering Program

Issue:

The Oklahoma Department of Commerce's 2004 Manufacturers database lists 5,669 manufacturing firms in Oklahoma. Only 47 (0.8%) have more than 500 employees. Breaking it down further, over 99% have fewer than 500 employees, 92% employ fewer than 100, and 86% employ fewer than 50. Approximately half of these small firms are located in rural areas and are extremely important to their local economies. The loss or downsizing of even one of these wealth-generating small or mid-sized companies can have devastating consequences for the host and surrounding communities. While products are quite diversified, there is limited global perspective with respect to markets and technology. These rural firms face particular difficulty in getting relevant and usable information and technical assistance that will keep them abreast of the rapid changes in manufacturing technology.

Personal per-capita income in rural Oklahoma is about 60% of the national average. Manufacturing jobs are among the higher paying jobs in Oklahoma. A robust manufacturing sector can be an important source of jobs in the rural areas of Oklahoma. Also, manufacturing as a percentage of gross state product has been declining and is now exceeded by services. This trend should be a cause of concern for rural areas in that they are less likely to be competitive for service sector enterprises.

What Has Been Done:
To address the difficulties faced by our small rural manufacturers, the College of Engineering, Architecture and Technology and the Division of Agricultural Sciences and Natural Resources at Oklahoma State University work in partnership to provide technical assistance through the Applications Engineering program. Since 1997, Applications Engineers have been deployed in the state in collaboration with the Oklahoma Cooperative Extension Service.

During FY 2005, the Applications Engineers, in cooperation with the Manufacturing Extension Agents of The Oklahoma Alliance for Manufacturing Excellence, served 87 small, mostly rural, manufacturers that employ more than 3,800 of our citizens. This effort included more than 2,700 hours of direct engineering assistance and technology transfer activities. Examples of engineering projects include assisting small manufacturers in implementing processes and procedures to comply with OSHA and EPA rules and regulations, process and product development, manufacturing facility layout, and manufacturing cost analysis.

In addition, the Applications Engineers mentored several senior engineering class design project teams during the fiscal year. These senior design team projects allow the students to work with a small manufacturer on a real world problem, and at the same time, provide the manufacturer access to some of our best and brightest soon to graduate engineers at virtually no cost. These project activities provide a win-win situation for both students and manufacturers.

Impact:
In order to receive engineering assistance the client must agree to a post-project impact assessment. This impact assessment is done using procedures developed by the National Institute for Standards and Technology for the Manufacturing Extension Partnership. The client is contacted some months after the completion of an activity and is asked a series of questions designed to assess the impact of the effort.

The impact of this program is measured in several ways. One is the economic value of the service to the company as reported by the client. Another measure is the number of jobs created or retained. Both impacts are measured by an independent survey of the client. Number of jobs created or retained is translated into economic impact using an income multiplier to compute the direct, indirect, and induced effects due to a change in the number of jobs in the manufacturing sector. The multiplier was developed from data collected from two different sources. First, the average salary for manufacturing in Oklahoma ($34,323) was taken from the U.S. Bureau of Labor Statistics published information for 2001. Secondly, the income multiplier of 2.2 was obtained from IMPLAN data for Oklahoma. The total economic impact can be computed by multiplying the average annual salary times the income multiplier to arrive at $75,511 for each new or retained job in the manufacturing sector.

In FY 2005, the Applications Engineers client projects had the following impacts:

Sales increase	$6,908,800
Sales retained that would have otherwise been lost	$3,385,000
Cost savings	$2,367,443
Costs avoided	$894,200
36 new jobs created at $75,511 per job	$2,718,396
50 jobs retained at $75,511 per job	$3,775,550
0 jobs lost at $75,511 per job	-$0
Investment in new plant facilities and equipment	$2,564,200
Total impact	$22,613,589

Scope of Impact: State specific

Source of Funding: Grant; State; Smith-Lever

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Key Theme – Leadership Training and Development

Title: Learning Through Service

Issue:
Learning the value of service to themselves and to their communities is an important part of the 4-H Lifeskills Model. Learning to “give back” helps young people develop empathy and a service orientation, which is necessary in civilized society.

What Has Been Done:
4-H members from sixteen southwest Oklahoma counties learned about the value of service to others through several different service learning activities at District 4-H Youth Action Conference. Members sorted and packed educational materials and food, sewed for troops and worked in a community garden. Following the activity, participants each set personal service goals to carry out once returning home. In addition, county groups selected one or more service learning projects to carry out as a unit.

Impact:
In just one day, 4-H members, volunteers and educators contributed more than 1,000 hours to help others. The market value of their labor represents a $5,000 + savings to the non-profit agencies the group worked with. At the Regional Food Bank of Oklahoma, almost 43,000 pounds of food was packaged creating 33,000 equivalent meals for the needy. Youth also worked at the food bank landscaping and they picked fresh vegetables in the garden. More than 300 neck coolers were sewn for troops, and three young people learned to sew that day. One hundred and twenty educational kits were assembled for Science and Family and Consumer Science teachers in Oklahoma classrooms.

Beyond the activities carried out that day, each young person was challenged to commit 10 hours to service in his/her home community or county. Assuming an average of 10 hours per person, the value of their contributions across the district would reach almost $13,000 within the 4-H year. More important, towns, parks and roadsides were cleaned; coats and food were collected for the needy; shut-ins were visited; and money was raised for worthy causes such as Habitat for Humanity.

Because of experiences such as these, a 2004 study of Oklahoma 4-H Alumni found them to be 20% more likely to volunteer within their communities and 25% more likely to assume a leadership role in the community or a volunteer organization. The effects of helping youth develop a service orientation last well beyond a day of service – it helps create a lifetime of service.

Scope of Impact: State Specific

Source of Funding: Smith Lever

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Title: Oklahoma Credential Cooperative Director Program

Issues:

The board of directors of an agricultural cooperative has responsibility for strategic decisions and for safeguarding the organizations assets. Agricultural cooperative board members are producers who are elected by the membership to serve with only token remuneration. In recent times, all board members, including cooperative board members are under intense scrutiny. The incidence of legal proceedings against board members has increased dramatically. These litigations are typically initiated by owner (member) groups and they focus on the competency and diligence of the board. The severe repercussions from errant business decisions and the intense scrutiny of board member competency have created a critical need for educational programs.

What Has Been Done:
In response to the critical need to improve the competencies of cooperative board members the Oklahoma Credential Cooperative Director (OCCD) program was created. The OCCD program involves two days of training on finance, legal responsibilities, parliamentary procedure, effective meeting management, strategic planning and other related topics. In designing the OCCD curriculum, board of director training material from across the U.S. was examined. OCCD instructors include OCES faculty as well as industry experts including bankers, auditors, attorneys and consultants. The OCCD program is delivered simultaneously at a central location and via two-way interactive video at eight remote locations across Oklahoma.

The OCCD program was initiated in November of 2001 Since then it has been offered eight times (spring and fall) with six advanced sessions. Over 225 directors have attended the Credentialing sessions and over 175 directors have returned for advanced training.

Impact:
The directors completing the OCCD program have a better understanding of financial management and the legal roles and responsibilities of the board of directors and are able to make better business decisions and to safeguard the assets of their cooperative organizations. Currently there are 121 Credentialed directors representing 44 cooperatives. There are 104 more directors who have completed one of the two required sessions. One hundred and seventy five directors from 37 separate cooperatives have attended an advanced session. The advanced attendance reflects the fact that almost every credentialed cooperative director returned for additional education. Twenty cooperatives have achieved the status of having every board member credentialed. The typical Oklahoma cooperative includes 1,500 or more farmer members and organizational assets of over $10M. The OCCD program impacts thousands of Oklahoma producers by enhancing the board's ability to manage and safeguard cooperative assets

Scope of Impact: Seventy-four cooperative organizations across the entire state of Oklahoma.

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Key Theme - Literacy

Title: Beaver County 4-H Reading Buddies Program

Issue:
There was a great need for after school programming in Beaver County. The purposes of the reading buddies program to the county program were to provide educational after school programming and increase the leadership skill of the 4-H youth. Also this program was needed to make 4-H and other youth aware of the resources in the community.

What Has Been Done:

The Reading Buddies Program was instrumental in increasing afterschool activities for Beaver County children. During the program 34 children who were not 4-H members were reached. Also 15 4-H members took part in the Reading Buddies Program. Therefore, a total of 49 different children were reached by the Reading Buddies Program. These children read books and had books read to them from 3:00pm to 4:00pm on Tuesdays and Thursdays August 30 through October 27. A total of 15 Reading Buddies Sessions were completed with an average of 14 children attending each session.

Impact:
The increase in the leadership skills of 4-H youth in Beaver County was measured in a post-test after project completion. According to the survey, 27.8% children believed that they learned leadership skills during the Reading Buddies Program. 16.7% of the children surveyed believed that they learned how to read better at the Reading Buddies Program. Finally, 55.6% of the children indicated that during the Reading Buddies Program they learned that reading is fun.

Increasing Reading Resources

The reading resources of Beaver County have been improved by the Reading Buddies Project through the purchase of 42 books at the Beaver County Pioneer Library.
These books were utilized in the Reading Buddies project as reading sources, and the books will remain at the Beaver County Pioneer Library indefinitely.

Increasing the Awareness of 4-H in the Community

Youth were asked at the completion of the project about their awareness of 4-H before the Reading Buddies project and after the project. Of the children who completed the Reading Buddies Survey, 50% of the children did not know what 4-H was before the Reading Buddies Program. After the program, 83% of the children surveyed stated that they learned more about 4-H during the Reading Buddies Program.

Scope of Impact: County Specific

Source of Funding: 4-H Enhancement Grant through the Hille Family Foundation; State; Smith-Lever

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Key Theme – Youth Development/4-H

Title: Learning about Science and Technology through 4-H

Issue:
"While the U. S. has long been a global leader in science, recent studies show that our students are falling behind their international peers. We must provide every student with a quality math and science education."

Congressman Frank Lucas, Oklahoma

According to a recent study by Duke University, the United States is producing less than a third the number of engineers as China and only half as many as India. The Whitehouse office of Science and Technology Policy estimates that half of all high school students taking physical science in the United States are taught by "out of field" teachers. To compound this situation, nearly half the states flunked an examination of statewide science standards for elementary and high schools according to the report *The State of State Science Standards*. Oklahoma was one of fifteen states that received and "F" on the appraisal. Routinely little if any science is taught in grades k-3 in Oklahoma due to the emphasis on math and reading skill development.

Science and technology play an important role in all aspects of our daily lives. Students should be made aware of the societal importance of science and technology and of the many career fields and opportunities related to these disciplines.

What Has Been Done:
Since the summer of 2002 Oklahoma 4-H has planned, sponsored and hosted a variety of science and technology related educational events and activities. Activities have ranged from overnight Camp-In's at the Kirkpatrick Omniplex Science Center to 4-H Science based in-service trainings for County extension educators. 4-H members have participated in Science Camps at Oklahoma State University and a Biotechnology Conference at the Noble Research Center.

Impact: **4-H Enrollment in Science and Technology Projects**

Year	4-H SciTech Enrollment	Change from FY 2002	% of 4-H Enrollment	Change from FY 2002
FY 2002	**19307**		**8.2%**	
FY 2005	**29653**	**+10346**	**15.0%**	**+6.8%**

Source: ES237 4-H Enrollment Data

Since FY 2002 the percentage of 4-H members enrolled in Science and Technology projects has increased annually. In 2002 there were 19,307 4-H members enrolled in Science and Technology projects, last year FY 2005, 4-H members enrolled in Science and Technology projects has increased by over 10,000, which is a 6.8% increase in member enrollment in Science and Technology projects in three years.

Funding Source: State, Smith Lever

Scope of Impact: State Specific

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B. Stakeholder Input Process

The Oklahoma Cooperative Extension Service (OCES) has a well-defined program advisory committee system that provides grass roots input for program planning. Each January or February, county extension staff seeks input from program advisory committee (PAC) members on program needs related to OCES strategic program priority areas. Advisory committee members are selected to represent various geographic areas of each county. They are representative of agricultural and natural resources interests, youth, families, community and government leaders, and the general public. Committee members also represent the ethnic diversity of the county, as well as different socioeconomic groups. These PACs continue as described in the Plan of Work.

During the plan period, the Division of Agricultural Sciences and Natural Resources updated its strategic plan. This meant that OCES also updated its strategic efforts in relation to the Division's plan. This process required considerable introspection as well as working with various groups representing the publics served by OCES. This process was in addition (but related to) the annual program advisory process mentioned above.

Considerable stakeholder input is also received through other means. 1) The state legislative and administrative branches frequently make laws, conduct hearings, empower taskforces and committees, make regulations, conduct interim studies, and directly express needs and problems which result in priority program issues. Input comes from Extension personnel participating in these processes as well as official directives. 2) Extension also regularly seeks input from

commissions, agencies, groups, foundations and other organizations representing various segments of the Oklahoma public. 3) Many key program components and programs within those components have advisory groups made up of stakeholders. 4) The Director has a statewide advisory group representing a wide array of interests relevant to our mission. This group has a three-year rotating membership and meets twice a year. It is also called upon at other times to provide input to items such as extension planning and the Division strategic plan.

C. Program Review Process

No significant changes were made to the program review process stipulated in the Oklahoma five-year plan of work. However, we have begun to consider means of better reviewing and verifying some reports and departmental papers offered as research and extension information in fulfillment of grants and contracts.

D. Evaluation of the Success of Multi and Joint Activities

1). The planned integrated activities reported in section F addressed many of the critical issues of strategic importance to stakeholders. Several of these programs directly addressed issues of cattle production and forage/hay production. These issues were consistently among the highest priorities included in input from Oklahoma agricultural producers. Similarly, several multi-state activities concentrated on production, management and economic programming related to cattle production, economic situation of farmers and public policy alternatives and actions. Each of which consistently surfaced as an important issue. Both integrated and multi-state planned activities addressed many of the community and economic development issues addressed in the listening sessions mentioned in prior section. Several of these planned activities concerned issues around alternative products - another high priority identified. The cropping integrated activities were very high priorities identified by groups representing some of the leading crops produced in the state - wheat, cotton and peanuts. Many of the pest, pesticide application, invasive species, animal waste management, and water quality issues important to Oklahoma producers don't know state boundaries and the multi-state activities are important in these efforts. National programs such as income taxes, forage testing, water quality, fire training, and youth and school programs improve efficiencies of programming over each state re-inventing the curricula. Rural health care issues are among the most often identified by groups representing communities. Integrated and multi-state activities in this area addressed this issue. Other integrated and multi-state activities addressed high priority areas of IPM and water quality.

2). Integrated activities related to alternative crops (vegetables, watermelons, canola, peaches) particularly addressed and were conducted in areas of the state where small farm, Native American and African American audiences are particularly targeted. Several integrated programs in community and economic development particularly served geographic areas with concentrations of African American and Native American populations. Multi-state programs in alternative crops, policy and structural issues of agriculture, water quality, rural health care, home-based business, and youth also impact traditionally under-served audiences.

3). The integrated research and extension activities and multi-state activities described expected outcomes and impacts.

4). Oklahoma Cooperative Extension Service (OCES) has a long history of integrated planned programs and multi-state planned programs. Those programs reported in sections E and F are only a portion of all programs OCES conducts that are integrated between research and extension and/or are multi-state. Integrated and multi-state programs are conducted because they address the issues, problems and needs expressed by our public and they are more effective or efficient than would be the case otherwise. Thus the answer is yes. Without the closely integrated research, many of the issues and questions raised for and through the extension would not be addressed. Likewise the obviously close relationship created by joint appointments makes the feedback to research from the extension of knowledge and technology immediate. Multi-state planned activities allows extension professionals to rely on one another in the development and sharing of resources, ideas, educational materials, and the development of new and innovative programs. Those planned activities presented in sections E and F are examples of efforts that result in programs that are better and more effective.

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities
(Attach Brief Summaries)
Fiscal Year: 2005

Select One: ☐ Intermin ☒ Final
Institution: Agricultural Experiment Station and Cooperative Extension Service
State: Oklahoma

	Integrated Activities (Hatch)	Multistate Extension Activities (Smith-Lever)	Integrated Activities (Smith-Lever)
Established Target %	9.2 %	5.7 %	8.1 %
This FY Allocation (from 1088) ***(Hatch column is Hatch plus Multi-State)***	$2,918,541	$5,205,875	$5,205,875
This FY Target Amount	$268,506	$296,735	$421,676
Title of Planned Program Activity			
An Agricultural System that is Highly Coompetitive in the Global Economy	$212,713	$149,501	$690,914
A Safe and Secure Food and Fiber System	$0	$0	$0
A Healthy , Well-nourished Population	$0	$5,787	$0
Greater Harmony Between Agriculture and the Environment	$50,926	$65,371	$40,698
Enhanced Economic Opportunity and Quality of Life for Americans	$49,947	$101,776	$136,952
Total	$313,586	$322,435	$868,564
Carryover	$0	$0	$0

Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays represented here accurately reflect allowable expenditures of Federal funds only in satisfying AREERA requirements.

Director **Date**

Reports

CSREES Goal 1: Integrated Activities

Name of Planned Program/Activity: Development of Harvest Aid Recommendations for Oklahoma Cotton Producers

Progress Report: New harvest aid materials and/or combinations of materials continue to be evaluated in replicated research plots as well as large scale demonstrations in Oklahoma. Multi-year results from these replicated experiments are used to develop recommendations for use of harvest aids for Oklahoma cotton producers. Harvest aid recommendations are extended through county educators and at producer meetings prior to the application season. Two PowerPoint presentations titled "The Art of Harvest Aids" and "The Science of Harvest Aids" have been prepared and presented to producer groups as well as to a meeting of Oklahoma, Texas, and New Mexico Consultants. Activities during the 2005 crop year include seven replicated and two large scale strip research and demonstration plots, applied by OSU primarily on cotton grown by local producers. Six presentations on timing and materials were given to producers prior to the application season, and two field tours showing plot results were presented to producers. Two "caravan" tours in Canadian and Caddo counties were conducted in cooperation with county extension educators. Weekly newspaper articles were written and distributed to 27 newspapers in cotton producing areas in Oklahoma and Kansas. In addition I continue to serve as southwest region co-editor of a Beltwide Harvest Aid Project and I authored a summary for the southwest region and wrote a chapter on timing of harvest aid applications for a Beltwide Monograph Book Series. The book is offered through the national cotton foundation book series.

Contact Name: Dr. J. C. Banks

Name of Activity/Program: Cooperative Projects 2005

Progress Report: Projects during 2005 included efforts directed at evaluation of vegetable germplasm, screening of new weed control materials for use in vegetable crops. Detailed results of these studies are included in the 2005 Vegetable Trial Report MP-164 and are available through the Department of Horticulture at Oklahoma State University.

Other States Involved: Oklahoma, Texas, Arkansas

Contact: Lynn Brandenberger

Name of Planned Program/Activity: Forage Management Research and Extension

Progress Report: The Forage Management Research and Extension team has a web page at http://forage.okstate.edu that defines forages and explains their importance to Oklahoma. The web site also breaks down forages into groups according to season of growth and type of forage. It includes short discussions about important production concepts and images of many of the forages

in the state. Links are included to extension publications in Oklahoma as well as other states. The web site embraces the fact that every state cannot investigate all aspect of forages but must rely on neighboring colleagues to provide certain pieces of the puzzle. Recently the group has developed a publication to help producers to better understand the wise use of forage legumes. The publication points out some of the misconceptions of using forage legumes to fix nitrogen by explaining realistically how much nitrogen can be fixed under varying conditions with an array of legume species. Part of this team was successful in getting money from the TIP program to investigate the possibilities of reintroducing alfalfa into eastern Oklahoma. The proposal includes researcher and extension specialists from the state, area, and counties.

Contact: John Caddel

Name of Program/Activity: Using the Oklahoma Mesonet for Decision Support in Agriculture and Natural Resources

Progress Report: A continuing emphasis which integrates research with extension is the development of weather-related management tools for agriculture and natural resources and their implementation on the Oklahoma Mesonet, the statewide network of 116 automated stations reporting weather data every 5 minutes and soil data every 15 to 30 minutes. These management tools consist of various useful maps of data derived from the Oklahoma Mesonet as well as various weather-based models which use Mesonet data. With respect to the latter, products include models for fire danger, atmospheric dispersion, evapotranspiration, insect pests, disease pests, and livestock heat/cold stress. In 2005, the Spinach White Rust and Pecan Scab models were revised (both now incorporate an 84-hour forecast component). Programming support for these products is provided by the Oklahoma Climatological Survey in Norman, OK. These products are available on the Oklahoma AgWeather web site (***http://agweather.mesonet.org***). Extension and outreach efforts for the Oklahoma Mesonet and its Web-accessible products continued in 2005, via trade show exhibits, educational programs, and development of educational print materials.

Contact: Dr. J. D. Carlson, Biosystems and Agricultural Engineering

Name of Program/Activity: OK-FIRE: A Weather-Based Decision Support System for Wildland Fire Managers in Oklahoma

Progress Report: This is an exciting new project, with both research and extension aspects, that was funded in 2005 from the USDI/USDA Joint Fire Science Program ($320,926 over 3 years). Terry Bidwell of Plant and Soil Sciences is co-PI. Using the Oklahoma Mesonet of automated weather stations as a basis for current and past conditions, the project will have a three-fold emphasis: (1) an expanded suite of products for fire weather, fire danger, and smoke dispersion which incorporate an 84-hour predictive component; (2) a dedicated OK-FIRE wildland fire management web site to act as the delivery mechanism for the above products; and (3) regional training and customer support activities for the user groups involved. Programming support and web site development will be provided by the Oklahoma Climatological Survey in Norman, OK.

Collaborators in the project include the following agencies within the wildland fire managment community in Oklahoma: USDA Forest Service, Bureau of Indian Affairs, US Fish and Wildlife Service, National Park Service, US Army Corps of Engineers, Oklahoma Forestry Services Division, and The Nature Conservancy. The recent severe wildfire season in Oklahoma has highlighted the importance of developing such weather-based tools for wildfire anticipation and management. These tools will also be important for those conducting prescribed burns.

Contact: Dr. J. D. Carlson, Biosystems and Agricultural Engineering

Name of Program/Activity: Development of a Weather-based Model for Predicting First Hollow Stem in Winter Wheat

Progress Report: This project, ongoing in 2005, has as its goal the development of a reliable weather-based model for predicting a particular growth stage of winter wheat, called "first hollow stem" (FHS). Past research by others has indicated that this stage is an indicator of when to remove cattle from grazed wheat fields. The same research has shown that grain yield decreases dramatically (a daily decrease of 1.25 bushels/acre) as cattle are left on grazed fields after the occurrence of FHS. Ten years of FHS data at several Oklahoma locations are being utilized in model development, while ongoing scouting in other locations has occurred over the past several years. In 2005 various degree-day models (using air and soil temperatures) were investigated, using various start dates and temperature thresholds for heat accumulation. Best results were obtained using 4” soil temperatures (under sod) with start dates ranging from Dec. 22 to Jan. 1, and temperature thresholds ranging from 32-34F, depending on wheat variety class. The ultimate goal is to integrate such a model with the Oklahoma Mesonet for real-time access over the internet by producers.

Contact: Dr. J. D. Carlson, Biosystems and Agricultural Engineering

Name of Program/Activity: Evaluation of a New Dead Fuel Moisture Model in a Near-Real-Time Data Assimilation and Forecast Environment

Progress Report: This joint project with the US Forest Service ended in 2005 and focused on evaluating a new numerical model (Nelson model) for dead fuel moisture (important for fire danger modeling). Early in the project, the model was tested against observed Oklahoma dead fuel moisture measurements from 1996-97; model parameters were optimized for best agreement. In 2004 we began integrating the model into the Mesonet data stream, and lately we have integrated it with the 84-hour Eta model forecast of the National Weather Service. The Nelson model will replace the algorithms for dead fuel moisture which were developed in the 1970s and will be part of the next-generation National Fire Danger Rating System of the US Forest Service. The Nelson model is currently being integrated into the next-generation Oklahoma Fire Danger Model, which will also include an 84-hour forecast component, permitting more accurate fire danger predictions over our Mesonet web site.

Contact: Dr. J. D. Carlson, Biosystems and Agricultural Engineering

Program Title: Pecan and Beef Cattle Production Systems.

Progress Report: The annual Oklahoma Pecan Management Course is now in its 8th offering and has reached over 250 growers since 1997. The course continues to be the standard for excellence in pecan extension programs for commercial producers. Started in January 2004, a web based pecan management course was launched to reach producers unable to take the resident course.

Contact: Dean McCraw and Becky Carroll

Program Title: OK Wine Grape Cultural Systems and Cultivar Evaluation

Progress Report: A grape research/demonstration cultivar trial consisting of 13 cultivars of wine grapes with potential for production in OK as well as two rootstock evaluation trials was established in April 2001 at the Oklahoma Fruit Research Station. Entries are under evaluation for hardiness, vigor, growth characteristics and wine quality. On farm test plantings have been established with commercial vineyards at three locations to compare grafted with own root vines of 12 varieties under varying climatic conditions in Oklahoma. Likewise, pest management programs including insect and disease scouting and assessment are underway on station plots as well as grower vineyards in at least three locations.

The Extension program accompanying this project includes the Oklahoma Grape Management Course now in its fifth offering. The course that consists of 7 monthly meetings utilizes the research station plots throughout the year and has included about 400 present and prospective grape growers.

Contact: Dean McCraw and Becky Carroll

Name of Planned Program/Activity: Biology and Management of Pod Decay Diseases on Processing Snap Beans

Progress Report: Snap beans are an important vegetable crop grown for processing in Oklahoma where about 5,000 acres are grown. Pod decay diseases, caused by *Pythium* and *Phytophthora* spp., are serious problems because snap beans are machine harvested in bulk with non-selective cutters and the diseases increase in the harvested beans before processing. Severely affected fields are rejected at a total loss to the grower (production costs) and processor (seed costs). Because fungicides have not been effective, research has been initiated to develop an integrated management program involving cultural practices and cultivar resistance for disease control through support from the USDA/CSREES Southern Region IPM, Allen Canning Co., and several seed companies. The effects of tillage, nitrogen fertility, and cultivar were evaluated in the field in 2006. No-till planting into wheat stubble increased plant height, height of the lowest node, height of the lowest pod cluster, and reduced lodging. Numerical reductions in pod decay incidence

associated with the tillage-induced changes in plant architecture were large, but variability was high and differences were not significant. Differences in cultivar but not nitrogen rate were significant for plant architectural characteristics and disease incidence. The upright cultivar, "Romano 942", had significantly less pod decay compared to the prostrate cultivar Roma II. The trial will be repeated in 2006 with an increased number of replications. Results obtained thus far have been transferred to clientele in grower and industry educational programs. While a complete solution to this disease has not yet been developed, cultivars with reduced pod decay are now being planted on a trial basis and fungicide use has been discontinued. Reducing nitrogen fertility rates, once thought to increase disease by promoting rank plant growth, may not be beneficial for disease control.

Contact: John Damicone

Name of Planned Program Activity: Fungicidal control of watermelon anthracnose

Progress report: Watermelon is the most economically important vegetable crop produced in Oklahoma and anthracnose is a key constraint on production. Approaches to the management of the disease vary widely among growers in the state. Many small-scale producers rarely apply fungicide even though the profitability of small-scale production could be improved. Small plot research has been conducted to evaluate the economic benefits of fungicide application in the production of watermelons. Research and extension personnel have collaborated to conduct research to evaluate economic benefits of fungicidal control of anthracnose. The results have been described to producers via individual consulting, informal meetings, and in-field demonstrations.

Contact: Jim Duthie

Name of Program/Activity: Evaluation of Sandbur Control in Sorghum

Progress Report: An experiment was conducted to examine efficacy of various herbicides on longspine sandbur in grain sorghum Various herbicides were evaluated under preplant incorporated and premegerent application timings. Herbicides evaluated includeded atrazine, Bicep II magnum, Lumax, Guardsman Max, Lexar, Prowl H_2O, Callisto, Camix and Axiom DF. All herbicides were applied at labeled rates. The experiment was a randomized complete block design with four replications. The plot size was 10 feet by 25 feet. Prowl H_2O caused severe grain sorghum injury. Longspine sandbur control ranged from 13 to 95% control rated three weeks after treatment.

Contact: Curtis Bensch

Name of Program/Activity: Evaluation of Prickly Pear Cactus Control in Rangeland

Progress Report: A field experiment was conducted at the Oklahoma Panhandle Research and Extension Center in Goodwell, OK to examine efficacy of various herbicides and herbicide tank mixes in controlling prickly pear cactus. Herbicides examined were 2,4-D, dicamba, picloram,

metsulfuron, diflufenzopyr, triclopyr, and hexazinone. All herbicides were applied at labeled rates. The experiment was a randomized complete block design with four replications. The plot size was 20 feet by 50 feet. Prickly pear control rated one year after application ranged from 11 to 95% control, with picloram at 2 pt/A giving the best control.

Contact: Curtis Bensch

Name of Program/Activity: Evaluation of Palmer Amaranth Control with Various Herbicides in a Roundup Ready Corn System

Progress Report: A field experiment was conducted at the Oklahoma Panhandle Research and Extension Center in Goodwell, OK to examine Palmer amaranth control in corn with various herbicides and herbicide pre-mixes. Numerous herbicides were examined including products from DuPont, Bayer, and Syngenta. All herbicides were applied at labeled rates. The experiment was a randomized complete block design with four replications. The plot size was 10 feet by 25 feet. Palmer amaranth was the only weed species on which control data was taken. Palmer amaranth control ranged from 46 to 100% control.

Contact: Curtis Bensch

Name of Planned Program/Activity: Expanding value-added calf management in Oklahoma

Progress Report: Research and educational efforts were continued to encourage further adoption of value-added calf management throughout Oklahoma. The objective is to add value to Oklahoma's calf crop and capture at least part of the added value for both producers and their customers. One example of this effort is the Oklahoma Quality Beef Network (OQBN). The OQBN is a collaborative effort between the Oklahoma Cattleman's Association and the Oklahoma Cooperative Extension Service. The OQBN includes a source and process verification system and marketing alternatives for producers. The process verification system is focused on standard health and management procedures that occur around the time of weaning. In general, OQBN process verification (or certification) requires producers to wean their calves at the home ranch for a minimum of 45 days and follow specific quality assurance, vaccination and nutritional guidelines. Faculty and extension personnel have collaborated to collect extensive evaluation data. Some of this data has now been published in peer reviewed journals and presented at scientific meetings as poster or oral presentations. Similarly, most of this data is now available as part of an extension publication.

Contact Name: David Lalman

Name of Planned Program/Activity: Increased Use Of Better Adapted/More Appropriate Turfgrasses That Are More Resource-Use-Efficient

Progress Report: The turfgrass industry remains under intensive scrutiny to reduce labor, pesticide, fertilizer and other cultural inputs while providing cost effective i) sod or sprig production, or in the case of maintained turf, ii) soil erosion control, high visual quality and/or functional quality for the playing of sports. We have tested some 1,395 commercially available and 3,075 experimental turfgrass varieties across 21 species for adaptation to lawn, roadside, parks & grounds, golf course and sod production applications in OK during the last 16 years. Research continued in 2005 regarding cultivar testing and proper management. Research results are used directly by the turfgrass specialist or end user when making recommendations concerning turfgrass selection for a given site. Over 500 consultations were conducted in 2005 via phone, fax, US mail, email and site visits concerning selection, installation and management of the best adapted turfgrass varieties. During phone consultations, approximately 75% of clients indicated that they would pursue purchase and installation of the best adapted cultivars as indicated by the turfgrass specialist. This percentage is expected to rise once addition stocks of newly released cultivars increase to fill market demand and prices of new materials stabilize and mature. Over 378 individuals received training on proper turfgrass selection and management in 4 workshops and conference conducted in the region during 2005. During new construction and renovation of specialty turf areas such as golf courses and athletic fields, better-adapted turfgrass varieties are being utilized in over 85% of cases in Oklahoma. Fungicide use for dollarspot disease control has been reduced by at least 10% when L-93, A-1, A-4 and G-2 creeping bentgrasses have been implemented on golf course putting greens in Oklahoma.

Contact: Dennis Martin

Name of Planned Program/Activity: Integrated Strategies For Management Of Spring Dead Spot Disease Of Turf Bermudagrass

Progress Report: Spring dead spot (SDS) is the most serious disease of turf bermudagrass in Oklahoma and in the transition zone states where the temperate and subtropical climate zones converge. Six multi-year trials that screened 80 bermudagrasses for SDS disease resistance have been completed. Three trials testing 52 varieties remained underway in 2005. Ten varieties with good or very good SDS disease resistance have been identified thus far in our joint state cooperative effort with Kansas State University and Colorado State University, with five of these varieties commercially available in the region. A sixth variety is being placed on an experimental plant materials transfer agreement to seek sod farmer input on potential for commercialization of the new variety. Patriot bermudagrass, a vegetatively propagated variety with improved cold hardiness and increased SDS disease resistance, was developed at Oklahoma State University (OSU) and commercially released in 2002. Growers were recruited and licensed such that sales of Patriot to the consumer commenced in Maryland (late 2003), Oklahoma (2004), and Missouri (2005). Addition growers were recruited to start production in Tennessee (2005) and North Carolina (2005). Additional recruitment will occur in 2006.

Riviera seeded bermudagrass, developed and released by Oklahoma State University continues to gain in popularity in the US and has now been used on athletic facilities in the U.S., Japan and Italy. Three licensees of Riviera sod are now in place across the US in order to meet the demand for sod of this variety when high erosion potential of sites precludes the use of seed. Four high

visibility college stadium fields in Oklahoma have now been converted to the newest and best adapted bermudagrass varieties over older common types. Proper varietal selection information as well as integrated management strategies for SDS management was transferred to 350 turf industry leaders at 3 state/regional conferences 9 master gardener training sessions, the 5th AR-OK Turfgrass Short Course, and the 60th Annual Oklahoma Turfgrass Conference. All attendees (100%) indicated that they would integrate our recommendations into their existing programs to manage the disease. Following our recommended practices will not eliminate but rather reduce severity of the disease, decrease time to recovery, and reduce disease management costs relative to use of fungicides alone.

Contact: Dennis Martin

Name of Planned Program/Activity: Organic Vegetable Production

Progress Report: Scientists at the Wes Watkins Agricultural Research and Extension Center in Lane, Oklahoma are continuing a project involving certified organic vegetable production in Oklahoma. Research and extension personnel from Oklahoma State University, as well as scientists from USDA/ARS/SCARL, are working jointly in this program. In 2003, land that previously had been planted with Virginia Pine was cleared, and preparation began for future organic vegetable research studies. Soil tests were taken, and lime was applied according to recommendations. Poultry litter was used as a fertilizer, and a cover crop of turnips was planted. In 2004, the land was partitioned into four sections, with tomatoes, sweet corn, southern peas, and watermelon being grown on respective quadrants of the land. All cultural practices and all materials used on the designated land are in compliance with the National Organic Program.
Records were kept of pest problems, severity of problems, cultural techniques used, and crop yields from each quadrant of the field. The study was continued in 2005. The same crops were grown as in 2004, with each crop being rotated to the plot adjacent to the area in which it had been grown the year before. A field day was held in June, 2004, and again in June, 2005 to demonstrate the problems and solutions associated with each crop to growers and consumers. Results were also presented at the Oklahoma-Arkansas Horticulture Industries Show in Tulsa, OK in January of 2006. Written reports were published in the Horticulture Industries Show Proceedings. The Wes Watkins Agricultural Research and Extension Center applied for and received certification as an organic agriculture facility in December of 2005. The Center is currently the only public facility in Oklahoma to have attained such certification. Various scientists from the Lane Agricultural Center are working with the Oklahoma Organic Growers Association to determine the major obstacles to organic vegetable production, to determine solutions to these obstacles, and to present this information to growers and association members.

Contact: Warren Roberts

Title: Managing Waterborne Plant Pathogens of Nursery Crops in Recycling Irrigation Systems

Phytophthora spp. are the most significant waterborne pathogens of ornamental nursery crops. When we measured the concentrations of *Phytophthora* spp. in irrigation runoff at a large wholesale nursery in eastern Oklahoma before and after a capture and recycle irrigation system was implemented, we found an unexpected and previously unreported result. Although concentrations of *Phytophthora* spp. in runoff entering retention basins from production areas were very high, concentrations were markedly lower in captured runoff subsequently pumped from these basins back onto crops in production areas. We identified the factors that could reduce *Phytophthora* spp. in retention basins as settling out, natural biological and physical degradation, and dilution with fresh or storm water. The extent of this reduction differed from basin to basin. Our more recent research has focused on understanding the fate of infective units of the waterborne fungal pathogen, *Phytophthora*, captured runoff held in retention basins prior to reuse. These included studies of the survival and dispersal of both motile and encysted zoospores. The results provide information on managing captured runoff in retention basins to achieve the greatest reduction in pathogens prior to reuse. Reports of the research results have been published and other manuscripts are in preparation.

We have developed recommendations for nursery managers on how to handle captured runoff to reduce pathogen levels based on our research findings. We have reported these in two nursery industry journals: The Western (The Magazine of the Western Nursery and Landscape Association), Fall 2002, Vol.4, No 3, pp. 40-41; and Nursery News, December 2002, Vol. 17, No. 12, pp14-15), and in a book chapter (von Broembsen, S.L., MacDonald, J. D. and Pscheidt, J.W. 2001. Disease management for nurseries using recycling irrigation systems. *IN:* Diseases of Woody Ornamental in Nurseries, APS Press, St. Paul, MN, pp. 423-430). This information has also been made part of the principal investigator's educational web site entitled "Disease Management for Nurseries Using Recycling Irrigation Systems" at http://entoplp.okstate.edu/zoospore/. This research has the potential to significantly impact disease management of nurseries that capture and recycle runoff and to promote practices that will protect the quality of surface water resources.

Contact**: Sharon L. von Broembsen**

Planned Program or Activity: Dry-land Crop Rotations and Tillage Systems in the Oklahoma Panhandle.

Progress Report: In the first seven years of the study, precipitation for April – August has been below the long-term mean for 5 of the 7 years. With the drought conditions grain yields have been highly variable year to year. Although in 2005 yield for no-till wheat was 19 bu/ac higher than for the minimum tillage treatment. This difference in yield was found at the same period that other researchers have reported increased benefits for no-till. In 2004 corn and soybeans were replaced with sunflowers and cotton respectively. Sunflowers have been lost due to jackrabbits consuming plots both years. In 2005 cotton yielded over a bale/ac, therefore more data needs to be collected to determine if cotton may be an alternative to grain sorghum in the wheat-grain sorghum-fallow rotation

Contact: Rick Kochenower

Planned Program or Activity: Planting Date for Grain Sorghum

Progress Report: With the increased interest in bio-fuels (ethanol in this case) question have risen about yields of grain sorghum for the body of Oklahoma. Therefore in 2003, grain sorghum planting date studies were established at Altus in SW Oklahoma and Lahoma in NC Oklahoma, to determine when highest yields could be constituently obtained. Along with the planting date studies seeding rate studies have been planted at all trial locations of Oklahoma Grain Sorghum Performance Trials. For SW Oklahoma April 1 appears to be the date when the highest yields are obtained at near 80 bu/ac. For NC Oklahoma, only one year of reliable data has been obtained, due to deer consuming plots. Although from other trials late April planting period tends to give the most consistent yields. As for planting rate is has been determined that 45,000 seeds/ac is the rate that producers should be planting. Although in 2006 a second hybrid will be added to determine what effect that a hybrid that tillers more will have.

Contact: Rick Kochenower

Name of Planned Program/Activity: Fed Cattle Pricing and Marketing

Progress Report: Sound decisions depend on reliable data. Mandatory price reporting legislation generated new data series which could potentially improve marketing decisions. An analysis of new data series related to prices and quantities of fed cattle packers purchased by alternative methods was undertaken. An article from that work appeared in *Choices* in 2005. Information on the background leading to implementation of mandatory price reporting legislation along with an assessment of the information derived from the new data were part of an in-service training program for county educators in 2005.

Grid pricing is intended to improve the accuracy of fed cattle prices. Each animal is priced independently based on its carcass attributes, rather than all animals in a sale lot receiving the same price regardless of carcass quality. Research was undertaken with data from four states to determine price signals sent from grid pricing. The research confirmed that weight still represents the largest component of net grid prices but that grid pricing increases the proportion of prices accounted for by carcass attributes. This research was published in the *Journal of Agricultural and Resource Economics* in 2005 and was added to the growing educational materials available on grid pricing at Oklahoma State University.

Price discovery has been an important issue for cattle feeders and others for many years. Several years ago, the Fed Cattle Market Simulator, nicknamed the packer-feeder game was developed at Oklahoma State University to teach market dynamics and price discovery. The packer-feeder game has been a regular part of extension programming in livestock marketing at Oklahoma State University for 15 years. Research in 2005 was conducted with data generated from a packer-feeder workshop at Excel Corporation to determine whether or not price discovery differed between periods of larger supplies and smaller supplies, such as through a cattle inventory cycle, and whether packers and feeders chose different pricing methods during periods of larger and

smaller supplies. In fart, pricing methods were modified during larger and smaller supply periods and factors affecting price discovery different somewhat between the two supply periods. This research was published in the *Journal of Agricultural and Resource Economics* in 2005 and has been incorporated into the body of knowledge from which we draw in conducting educational workshops with the Fed Cattle Market Simulator.

Contact: Clement Ward

CSREES Goal 4: Integrated Activities

Name of Planned Program/Activity: Joint Research and Extension Directed at Pest Management Technology Transfer Concerning Biology, Ecology, and Management of Wooden-Structure-Destroying Subterranean Termites – CY 2005

Progress Report: Field and laboratory studies on termite foraging, food preferences, taxonomy, distribution, soil-movement capabilities, cuticular hydrocarbon profiles, proteomic-biochemistry determinations, and life habits are actively being studied. These studies are centered in Oklahoma, but are national and international in scope, and include environmentally safe termite baits, new technology non-repellent termiticides, innovative termiticide application protocols, physical exclusion barriers, termite-resistant building materials, and fate of termiticides in soil. Pest management professionals continued to be trained at the Pinkston Education Facility for Structural and Urban Pest Control located on the Stillwater Campus of OSU. A total of 37 scientific technical conferences, workshops, training sessions, and presentations were conducted. These ranged from presentations at scientific meetings to classroom and field training for certified pesticide applicators. Additionally, 18 Oklahoma "Experimental Use Permit" (EUP) structures are in a program to evaluate new termite control methodologies that could lead to reduced pesticide use. This is a USEPA and State of Oklahoma (ODAFF) approved program that is conducted by Kard (OSU) to evaluate new methods in protecting wooden structures and building components from termites. One peer-review scientific paper was published addressing comparative morphology of termites across Oklahoma. Two technical papers and proceedings, and two technical abstracts were published. Two additional peer-review scientific papers concerning ecology, biology, and management of subterranean termites were submitted to journals and are in process. Teaching IPM improved sanitation practices and insect pest management practices around structures and improved building monitoring and inspection to eliminate conditions that are conducive to termite infestation, leading to cost reductions for termite control.

Impacts:

1. 100 Oklahoma structural pesticide applicators received training at OSU, achieving pesticide applicator certification for general and structural arthropod pests.
2. 1,990 pest management professionals received training at 18 Conferences and Workshops across Oklahoma and nationally.
3. A continuing field survey to search for the exotic and destructive Formosan termite, as well as indigenous termites, was initiated in February 2005.
4. One scientific, and four extension technical papers and abstracts were published, reaching several thousand readers.

Contact: Brad Kard, Dept. of Entomology and Plant Pathology

CSREES Goal 5: Integrated Activities

Name of Planned Program/Activity: Preparing Community Service Tools for Rural Decision Makers

Progress Report: This research project continues to develop tools that Extension personnel can use in Oklahoma and across the U.S. The tools can be classified into two categories; (1) impact models and (2) community service budgets. The impact models have been developed to measure the economic impact of the health sector components on the economy. State and local impact models have been developed. These models have been shared with health professionals across the U.S. through the National Rural Health Works Center, which is managed by OSU. Additional health impact analyses were completed for measuring the impact of a federally qualified health center on a local economy and the impact a new hospital has on an economy. Community service budgets are underway for specialty physicians and telemedicine.. These tools allow Extension to work with community leaders in determining how to provide essential services within their financial constraints. Budget studies were completed in about 25 communities in Oklahoma in 2005.

Contact: Gerald A. Doeksen

Name of Planned Program/Activity: Retail Trade and Gap Analysis

Progress Report: A database and methodology has been developed and which allows analysis of local retail trade trends. The database is maintained and updated annually. This applied research project is then presented to community leaders as a written report and in PowerPoint format. Typically, the report is prepared on campus and then provide electronically to the local extension educator and the area CD specialist for presentation. Over the past year 15 communities have utilized this program in Extension educational settings. Community leaders express satisfaction with this customized research report. The Oklahoma Department of Commerce frequently refers community leaders to OSU to provide this research-based service. Several communities report successful local retail development efforts which have utilized the data and report.

Contact: Mike D. Woods

CSREES Goal 1: Multi-State Activities

Name of Planned Program/Activity: Multi-State Cooperative Projects 2005

Progress Report: Multi-state projects during 2005 included efforts directed at evaluation of vegetable germplasm, screening of new weed control materials for use in vegetable crops.

Detailed results of these studies are included in the 2005 Vegetable Trial Report MP-164 and are available through the Department of Horticulture at Oklahoma State University.

Southern pea evaluation is a cooperative effort between eight land grant universities located in Oklahoma, Texas, Arkansas, Missouri, Louisiana, Mississippi, South Carolina and Alabama. The program is titled the Southern Cooperative Pea Trial. During 2005 13 advanced breeding lines were included in the replicated trial and 10 in the observational trials at the Bixby and Goodwell Research Stations.

Weed control research and demonstration work during 2005 included cooperative work with research colleagues at the University of Arkansas, Texas A&M, and Interregional Project # 4 of U.S.D.A. (IR-4). During 2005, 7 different study/demonstrations were carried out throughout the state and included work on cilantro, cabbage, cucurbits, drybean, pumpkin, and spinach. Detailed results of these studies are include in the 2005 vegetable weed control studies in Oklahoma MP-162.

Other States Involved: Oklahoma, Texas, Arkansas, Missouri, Louisiana, Mississippi, and Alabama

Contact: Lynn Brandenberger

Name of Activity/Program: National Women in Ag Extension Education Conference

Progress Report: I served on a Planning Committee for the 2006 National Women in Ag Extension Education Conference. Goals for the conference were set, promotional strategies devised, types of sessions to be included in the program were discussed, and potential keynote speakers were identified. Session and poster proposals were reviewed. The conference is scheduled for April 6-7, 2006 in St. Louis.

Contact: Damona Doye

Name of Planned Activity/Program: National and Regional Extension Professional Associations

Progress Report: I served on American Agricultural Economics Association (AAEA) Extension Section Board as past-president through July 2005. The Board helps plan contributions to AAEA meetings that will increase their value as a professional development opportunity for Extension economists. An ag study tour, organized symposia, outlook sessions, luncheon with keynote speaker are part of the Extension section track. Monthly conference calls are used to conduct business and e-newsletters are used for communication with Extension Section members.

I also serve on the North Central and Southern Farm Management Extension Committees. We identify opportunities to collaborate on projects and publications. Both committees are exploring opportunities to collaborate with the Center for Farm Financial Management to improve and expand website offerings of materials developed by regional committees as well as materials from member states. In addition, the North Central Committee submitted a proposal for an Invited

Paper session at the 2006 SAEA meetings and developed a risk management education grant proposal to support estate and farm transition planning in multiple states. The Southern Extension Committee responded to an eXtension call for proposals to build on our experience teaching people to use Quicken for farm financial record-keeping.

Contact: Damona Doye

Name of Activity/Program: Southern Agricultural Economics Association

Progress Report: In 2005, I was president-elect of the Southern Agricultural Economics Association, a regional professional association that offers professional development opportunities through annual meetings and publication of the Journal of Agricultural and Applied Economics plus offers peer recognition through awards. The annual meetings included invited papers, selected oapers and posters, and organized symposia for professionals plus an academic quiz bowl for students. The association has approximately 400 members.

Contact: Damona Doye

Name of Planned Program/Activity: National Extension Advisory Committee on Federal Taxation

Progress Report: In 2005, the committee cooperated with the Internal Revenue Service (IRS) to review, write, and distribute the 2005 IRS Publication 225, Farmers Tax Guide that has been distributed to nearly 300,000 agricultural producers and tax professionals across the nation. Participants from 20 states are represented on the committee. The participating members represent both extension and research appointments in their respective states. These activities are conducted under a Memorandum of Understanding between USDA and IRS. This committee meets with IRS staff in Washington each year in May to jointly write the Farmer's Tax Guide. The agenda also includes presentations from USDA and a meeting with the Joint Committee on Taxation. This important meeting allows our committee to inform the Joint Committee on Taxation about agriculturally related taxation problems and issues.

Contact: J C. Hobbs

Name of Planned Program/Activity: National Income Tax Preparer Education

Progress Report: In 2005, representatives from more than 20 states cooperated to develop educational material and conduct seminars and workshops for both farm and non-farm tax practitioners. More than 29,000 tax preparers and other professionals attended these sponsored seminars nation wide. The National Income Tax Workbook is also used to provide training for IRS and state department of revenue employees. Contributors represent both extension and research appointments at their respective Universities, IRS employees, and various tax school instructors. Educational materials were used in 30 states. The Land Grant University Tax

Educational Foundation, (LGUTEF) coordinates and enhances the effectiveness of national and state tax education activities by land grant university professionals.

Contact: J C. Hobbs

Name of Planned Program/Activity: 2005 Public Policy Education & Public Issues Education Program

Progress Report: This program is coordinated with the Southern Extension Public Affairs Committee (SEPAC:12 state Extension policy specialists and the National Public Policy Education Committee (NPPEC: representatives from most states)). Working with such organizations as Farm Foundation, the Kerr Center for Sustainable Agriculture, and Farm Bureau, members of the committees are conducting a coordinated, ongoing effort to periodically conduct environmental scans of the controversial issues especially affecting agriculture and rural communities. For example, we are developing programs on environmental issues affecting the Southern Region, community development policy, conservation programs in the current farm act, farmland protection, the budget and appropriations process, trade policy and obesity. Support and planning of members succeeded in the 2005 NPPEC Conference in Washington, DC, with a program that included briefing the House and Senate Ag Committee staffers; 2005 SAEA Conference including presentations on the Federal Budget Deficit, Obesity, and Agricultural Policy Issues, Basic and advanced training for Extension Educators; SEPAC join with other Southern extension marketing and farm management economists in Clearwater to conduct a joint program; coordination and authorship of the "Farm Bill Education Materials Project for 2006" was initiated in 2005, working with SEPAC, NPPEC, Farm Foundation and USDA . Co-authorship of articles suitable for the popular press have increased to improve response to emerging issues.

Contact: Larry D. Sanders

Name of Planned Program/Activity: NCR-194 Regional Research on Cooperatives

Progress Report: A research and outreach forum: Farmers Cooperative Conference was conducted in Kansas City during November. The annual two-day forum involving participation from academics, upper and middle management personnel from cooperatives, directors from cooperatives, and researchers in government. It focuses on ongoing research on cooperatives, identifying research issues, and coordinating research projects and outreach efforts among the participants.

Contact: Phil Kenkel

Name of Planned Program/Activity: Western Coordinating Committee on Agribusiness

Progress Report: WERA-72 (Western Coordinating Committee on Agribusiness) serves as a forum in which Agribusiness professors can share knowledge exchange of ideas and coordination

of projects in teaching, research, and extension. The multi-state effort host a web-page and list server to speed communication among industry, government, and academia. During 2005 WERA-72 members investigated important biosecurity issues involving the U.S. grain supply. Research conducted at Oklahoma State University on the level of co-mingling in the U.S. Hard Red Winter Wheat marketing system was presented at the WERA-72 annual meeting.

Contact: Phil Kenkel

Name of Planned Program/Activity: Great Plains Cooperative Consortium

Progress Report: The Great Plains Cooperative Consortium involves academic cooperative specialists from Oklahoma State University, Kansas State University, University of Missouri, Texas A&M University and Colorado State University as well as representatives from state cooperative councils in the above states. The GPCC coordinates research, outreach projects and conferences in the participating states. Activities completed in 2005 include a study of equity retirement systems and a feasibility study for an oilseed crushing facility.

Contact: Phil Kenkel

Name of Planned Activity/Program: North Central Region Cow/Calf Committee

Progress Report: The objective of this multi-state group is to exchange ideas, data, information, and research techniques in a cooperative, interdisciplinary effort among research stations to maintain an environmentally and economically sound beef cow/calf industry. The group meets annually for a two-day sharing and planning session. The meeting location is rotated among states so that different production systems and research programs can be visited. The group also collaborates to publish fact sheets and sponsor/organize an annual symposium at the Midwest Animal Science Meetings in Des Moines, Iowa. Proceedings from this symposium are published in peer-reviewed journals or published as extension fact sheets. One symposium was held at the Midwest Animal Science Meetings and two review articles were published in a peer reviewed journal. Dr. Lalman presented an abstract and a paper at the symposium and, along with his graduate student, Jason Banta, and Dr. Robert Wettemann, submitted and completed the review process for publication in the Professional Animal Scientist.

Banta, J.P., D.L. Lalman, and R.P. Wettemann. 2005. Post-calving nutrition and management programs for two-year-old cows. J. Prof. Anim. Sci. 21:151-158.

Other States Involved: CO, IL, IN, IA, KS, MI, MN, MO, MT, NE, ND, OK, SD, VA, OH, WI

Contact: David Lalman

Name of Planned Program/Activity: Increased Use of Better Adapted Turf Bermudagrasses in Transition Zone States

Progress Report: Selection and use of the best adapted turfgrass varieties results in turfgrass stands providing improved quality of human life through reductions in soil erosion, urban noise, glare, particulate pollution, and sports turf injuries. Reduced potential of off-target environmental impacts also occurs due to reduced maintenance inputs when using best-adapted turfgrasses.

Sixty-one turfgrass managers were trained on proper turfgrass selection techniques during the 2005 Arkansas-Oklahoma turf short course. The total number of trained professionals from Oklahoma, Arkansas, Kansas, Missouri and Texas during the first five years of the joint-state turf short course is 307. All managers indicated that they would use the information in making proper turfgrass selection decisions. An Arkansas-Oklahoma turf short course manual and digital presentation were updated to meet region-specific needs. These resources are used as a corner stone in employee training in fifteen lawn care enterprises, one national seed-sales enterprise and five University grounds divisions in Oklahoma, Arkansas and Missouri.

An Arkansas-Louisiana-Oklahoma-Texas Centipedegrass and St. Augustinegrass sod producer directory (Current Report 6607) was finalized in 2005 to serve the four-state area.

A 2002 on-site turf production demonstration in Maryland continues to pay dividends in educating consumers regarding the adaptation of OSU bermudagrass products such as Patriot bermudagrass. Foundation pedigree stock from this plot was also used to start new licensee farms in 2005. Two additional licensed producers of Patriot hybrid bermudagrass were recruited in 2005, these being in Tennessee and North Carolina. Patriot bermudagrass production is now occurring in five states. Patriot has improved cold hardiness and improved resistance to spring dead spot disease while matching or exceeding the quality of existing industry standards.

Cooperators: Turfgrass programs at the University of Arkansas, the National Turfgrass Evaluation Program, United States Golf Association, the Golf Course Superintendents Association of America and Oakwood Sod Farm in Salisbury, MD.

Contact: Dennis Martin

Name of Planned Program/Activity: S-1017 (previously S-293): Improved Insect and Mite Pest Management Systems on Pecan

Progress Report: This group is now under a new proposal, written and submitted for approval in 2004. The new project has been accepted and the group had their first meeting at the Western Pecan Conference in Las Cruces, New Mexico. During these meetings several new projects were discussed including cooperative research projects on pecan weevil and pecan nut casebearer. In addition, the group is assembling information for a book on pecan insect pest management. This latter task is being led by Dr. Jim Dutcher, David Sharpiro and Marvin Harris. Cooperative tests between Oklahoma, Georgia, Kansas, Louisiana and Texas are ongoing. These evaluations are related to the use of pheromone traps for making treatment decisions and using incorporated materials in controlling pecan weevil to suppress aphid populations. In addition, evaluations aimed at identifying a marker pheromone for pecan weevil oviposition are underway and are being led by

Dr. Mulder. The first of these cooperative efforts is supported by a grant from Southern Region IPM (approved 2005), and sub-account funds for Oklahoma are used to pay for technician support. Additional studies focused on monitoring and phenology of phylloxera in native and improved cultivars and the use of a degree-day based system for predicting their prevalence in these areas. Three years of data were assembled on this project and information from all test sites was presented at the Western Pecan Conference in Las Cruces, New Mexico and at the Oklahoma Pecan Growers Annual Meetings. A manuscript was prepared, submitted and accepted for publication in February 2006. It is currently in press in the Journal of Entomological Science. Drs. Hall (Louisiana) and Mulder (Oklahoma) will co-author this effort.

Contact: Phil Mulder, OSU Extension Entomologist

Name of Planned Program/Activity: Cereal Aphid Pest Management Initiative

Progress Report: The Areawide Cereal Aphid Pest Management Initiative is in its fourth year and includes state partners from Colorado, Nebraska, Kansas, Oklahoma, Texas and Wyoming. Dr. Sean Keenan, the Rural Sociologist has completed collecting data from the focus group studies conducted with 147 cooperating producers from all cooperating states. He just finished a second round of focus group interviews with cooperators in all cooperating states and has completed revisions on a book chapter and the 2005 Report. A CD version of the Cereal Aphid Expert System has been completed. Planned activities include a Wheat Production Guide. Diane Varner, a communications specialist continues to produce a quarterly newsletter called "Plain View" that is sent to all producer cooperators. Field plots have been established at all locations, and the fourth year's data has been collected under the supervision of Dr. Kristopher Giles. Additional information can be obtained by going to the Areawide web site at http://www.ars.usda.gov/Business/docs.htm?docid=6555. All previous annual reports are available on that site.

Contact: Tom A. Royer

Name of Planned Program/Activity: Developing a North American Institute for Beef Economic Research (NAIBER)

Progress Report: Oklahoma State University is a cooperator with Kansas State University and the University of Lethbridge with funding from the National Beef Industry Development Fund through the Canadian Cattlemen's Association to develop the Institute. The lead institution is Kansas State University. While research is in the title of the proposed Institute, a major objective involves extension education programming oriented toward the beef industry. Over the past year, a development plan has been prepared, a board of directors/advisory committee from industry and academia is being organized, a web site created (http://www.naiber.org/default.htm) and plans are being made for a kickoff conference later in 2006.

Contact: Clement Ward

CSREES Goal 3: Multi-State Activities

Name of Planned Program/Activity: Cooperative Extension Curriculum Project (CECP)

Progress Report: The southern region Cooperative Extension Service has developed a multi-state distance in-service training and education system entitled Cooperative Extension Curriculum Project (CECP). As the Oklahoma OCES Nutrition Education Specialists I am co-chair of the southern region CES CECP Food, Nutrition and Food Safety Team. In 2005 I participated in multi-state teleconferences and developing a distance in-service training lesson on Food Groups to Encourage for the Dietary Guidelines module. In 2006 the southern region CES CECP Food, Nutrition and Food Safety Team will be developing a new distance in-service module.

Contact: Janice Hermann

CSREES Goal 4: Multi-State Activities

Name of Planned Program/Activity: National Advanced Fire and Resource Institute – USDA Forest Service, Tucson, AZ.

Progress Report: Provided a presentation and training course on maintenance and restoration of native plant communities with prescribed fire and prescribed grazing. This course is for all Federal natural resource agencies (FS, BLM, FWS) to equip them for ecosystem maintenance and restoration work as mandated by Federal Policy.

Other States Involved: All 50 states plus Guam and the Caribbean Islands

Contact: Terry Bidwell

Name of Planned Program/Activity: National Range Judging Contest – Judging Rangeland for Livestock and Wildlife Values

Progress Report: Conducted the national high school judging contest for 4-H and FFA students to learn about rangeland ecosystems and their management for livestock and wildlife. This contest is the culmination of numerous county, regional, and state contest conducted across the country.

Other States Involved: 38 states

Contact: Terry Bidwell

Name of Planned Program/Activity: Restoration of Lesser Prairie Chicken Habitat

Progress Report: Provided research information; trained state and federal agency personnel, and conducted meetings to improve landowner awareness on lesser prairie chicken habitat restoration. There are 4 demonstration sites in western Oklahoma devoted to this effort. I am using our long-term research project in western Oklahoma to facilitate the application of patch burning in

shinnery oak communities on approximately 60,000 acres (5 ranches) in the Texas panhandle and NW Oklahoma. Two field days in 2 states will be conducted in 2006.

Other States Involved: Texas, New Mexico, Colorado, and Kansas

Contact: Terry Bidwell

Name of Planned Program/Activity: Restoration of Greater Prairie Chicken Habitat

Progress Report: Provided research information on a new fire and grazing system for private landowners that restores greater prairie chicken habitat. I conducted 1 field day on one demonstration site in north-central Oklahoma. One comprehensive publication was developed and published in cooperation with the Kansas Department of Wildlife and Parks. One field day will be conducted in 2005.

Other States Involved: Kansas

Contact: Terry Bidwell

Name of Planned Program/Activity: Oklahoma IR-4 Program

Progress Report: Oklahoma minor crop do not have many crop protection options in their tool box. Oklahoma IR-4 works with the National IR-4 program in finding and getting new crop protection chemicals for minor use crops.

Oklahoma works with IR-4 Programs in Texas and Arkansas to secure new needs for minor use crops. Oklahoma works closely with these states since their minor use crop needs are very similar to Oklahoma. Oklahoma IR-4 attends growers meetings and meets with specialists on what to submit for Oklahoma IR-4 needs.

Oklahoma IR-4 is keeping abreast of the impact of soybean rust on minor legume crops such as snapbeans and southern peas. Oklahoma IR-4 submitted 25 Pesticide Clearance Requests to IR-4 headquarters for Oklahoma crops. Multi state cooperation occurs again with Texas, Arkansas, and other states in the Southern Region such as Tennessee for Processing greens and Georgia for Pecans.

Other States Involved: multi-state southern region (Oklahoma, Texas, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, North Carolina, South Carolina, Florida, Kentucky, and Virginia.)

Contact: Jim Criswell State Pesticide Coordinator

Name of Planned Program/Activity: Oklahoma Pest Management Network

Progress Report: Providing pest management information for Oklahoma to USDA and EPA for pesticide registrations, and other pest issues. Also the Oklahoma Pest Management Networks provides a way for Oklahoma growers to provide input USDA and EPA on pesticide issues.

Oklahoma Pest Management Network is part of the Southern Region Integrated Pest Management Center. OPMN attends Southern Region IPM Center meetings to provide Oklahoma information and stay in touch with pest issues that might affect Oklahoma growers. OPMN meets with many different stakeholder groups to determine their needs and help convey those needs to USDA and EPA. A web site has been put up to provide growers and university personal with information on EPA regulatory issues such as pesticide registrations. Also OPMN provides the Southern Region IPM Centers with crop profiles and pest management strategic plans which are used by USDA and EPA for pesticide registrations concerning issues in Oklahoma.

Oklahoma provided to the Southern Region IPM Center information on aldicarb (Temik) use in Oklahoma to support re-registration of this pesticide on cotton, peanuts, soybeans and other crops. Oklahoma also provided the Southern Region IPM Center information regarding copper fungicide use in Oklahoma to support re-registration on Oklahoma crops. Information regarding soybean rust is relayed through USDA and is communicated through this program. Peanut and cattle crop profiles were completed and will be submitted in early 2006. A web site for growers and University personal to keep track of regulatory issues affecting pest management has been developed and can be found at http:// pested.okstate.edu.

Other States Involved: multi-state southern region (Oklahoma, Texas, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, North Carolina, South Carolina, Florida, Kentucky, and Virginia.)

Contact: Jim Criswell State Pesticide Coordinator

Name of Planned Program/Activity: Pesticide Safety Education

Progress Report: OSU PSEP works with the Missouri IPM and Pesticide Certification program in assisting them with their fumigation certification and recertification. OSU PSEP also works with Kansas State University in their certification program for pest control operators and grain elevator managers. OSU PSEP cooperates with the states of Arkansas, Kansas, Louisiana, Missouri, South Dakota and Texas in pesticide certification and various IPM programs ranging from school IPM to grain management.

OSU PSEP conducts the required practicals for General Pest, Structural and Fumigation certification. Applicators from Arkansas, Kansas, Louisiana, Oklahoma, and Texas have attended one or more of these practicals.

Other States Involved: Arkansas, Kansas, Louisiana, Missouri, Oklahoma, South Dakota, Texas

Contact: Jim T Criswell

Name of Planned Program/Activity: Southern Region Water Resources Planning Committee

Progress Report: Michael Smolen, Mitch Fram, LaDonna McCowan, and Maifan Silitonga, from OSU, and George Dubai, from Langston, participated in the National Water Quality Conference in LaJolla, CA (Feb 2005). This delegation contributed two posters. Smolen presented a report to the general session, with co-presenters Cass Gardner, Florida A&M University and Virgil Dupuis, Salish Kootenai College, on progress in Collaboration among 1862, 1890, and 1994 land grant institutions. In addition, Smolen chaired a collaboration planning session during the National Conference in LaJolla.

Smolen participated in two additional Southern Region planning sessions, during May 2005 in Baton Rouge, LA and October in Lexington, KY,and chaired the program committee developing the 2005 Southern Region Water Conference, held in Lexington, KY during October.

A delegation of 13 from Oklahoma (Smolen, Sutherland, Fram, Propst, Kizer, Vick, Hollenback, Mundy, Payne, Zhang, Silitonga, and Hamilton from OSU and Mundende from Langston University) attended the Southern Region Conference in Kentucky, October 2005. The delegation presented four oral reports and three workshops and participated in work group meetings for Regional Program Area teams.

Accomplishments: The Collaborative Conference successfully developed follow-up work groups, developed a National Facilitation Proposal and was successful in receiving funding. Smolen is on the advisory committee for the resulting project.

Contact: Michael D. Smolen

Name of Planned Program/Activity: SERA-IEG-6 Methodology, Interpretation, and Implementation of Soil, Plant, Byproduct, and Water Analyses

Progress Report: This group develops, modifies, and documents reference laboratory procedures, "regionalizes" soil test calibration/correlation and interpretation efforts among states that share similar soils and climate, and encourages both analytical proficiency and adequate quality control/quality assurance for nutrient analysis laboratories in the Southern Region of the United States. Oklahoma State University hosted 2003 Annual Meeting in Stillwater from June 5 to 7 to exchange ideas, discuss common issues. Nearly 30 participants representing 12 southern states attend the meeting. Two sub-committee meetings took place before and after the main conference. I currently serve as the vice chair of the group. A number of other issues were discussed at the meeting and via list-serve. All those activities greatly enhanced the soil and other agricultural testing program in the southern region, e.g., more consistent results, shorter turn around time and more clientele satisfaction. The group is developing a video tape to high light the importance and techniques of soil sampling for homeowners and wildlife food plots. It is anticipated to finish in June 2006.

Contact: Hailin Zhang

CSREES Goal 5: Multi-State Activities

Name of Planned Program/Activity: Extension Youth Serving Communities Grant Project

Progress Report: The Southern Extension Region submitted proposals in three areas: 4-H Afterschool, Youth and Adult Partnerships, and Volunteer and Staff Development. Oklahoma staff assisted in writing and submitting a grant in the Afterschool area. The grant has been used to provide support to the development of an online Staff Development Course that has been posted on the SR Cooperative Extension Curriculum Project (CECP) web-based Campus.

Contact: Nancy Dunlap and Jeff Sallee

Name of Planned Program/Activity: Kansas City Global Conference

Progress Report: A four day conference for 4-H youth ages 15-19. The focus of the conference is cultural awareness and career preparation. There are about 350 youth who attend from the following states: Missouri, Kansas, Iowa, Arkansas, Nebraska and Oklahoma.

Contact: Charles Cox and Tracy Branch

Name of Planned Program of Activity: SR Cooperative Extension Curriculum Project (CECP) web-based Campus.

Progress Report: Two staff from Oklahoma serve on design teams for development and posting of courses for the SR Cooperative Extension Curriculum Project (CECP) web-based Campus. The team works with input from other SR states that determined the scope and sequence of the core curriculum that would be posted.

Other States Involved: Texas, Arkansas

Contact: Charles Cox, Jeff Sallee, Karla Knoepfli

Name of Planned Program of Activity: SR Biennial 4-H Conference

Progress Report: Oklahoma is hosting the meeting which was originally planned in Mississippi. Following the hurricanes of 2005 the meeting was moved to Tulsa.

Other States Involved: Arkansas, Mississippi, and rest of the Southern Region States

Contact: Charles Cox, Tracy Branch

Name of Planned Program: Economic Tools for Health Planning

Progress Report: One objective of this project is to train other state professionals (Office of Rural Health, Extension, State Hospital Association, Area Health Educators, etc.) to be able to conduct the health impact model, community engagement process, and health budgets. This is accomplished by workshops, presentations at meetings, conference displays, etc. In 2005, I conducted two regional workshops, made presentations at 13 national or regional meetings and participated in four national conferences. In addition, I have been active in SERA-19 (Southern Region Extension and Research Activity project). I have had extensive hands-on projects in Colorado, Washington, Mississippi, and Montana.

Contact: Gerald A. Doeksen, Regents Professor and Extension Economist

Name of Planned Program/Activity: NE-167 - Family Businesses in Economically Vulnerable Communities

Progress Report: Data from second and third surveys are being analyzed. An socio-economic vulnerability index has been developed that categorizes each county in the United States. The index is now being tested to determine how well it can predict business success and/or failure. A subjective index is also being developed. For more information see 2004 annual report at: http://www.human.cornell.edu/ne167/

States Involved: AR, HI, IL, IN, IA, MN, MT, NY, ND, OH, OK, WI, Baruch University

Contact: Glenn Muske

Name of Planned Program/Activity: Family Resource Management Via the Web

Progress Report: This web site was completely revised in 2002. Small updating continues. It continues to be used for in-service training.

States Involved: MT

Contact: Glenn Muske

Name of Planned Program/Activity: Great Plains Inter-Institutional Distance Education Alliance

Progress Report: The Great Plains Interactive Distance Education Alliance (GPIDEA) is a consortium of Human Sciences Colleges at ten universities. Students may pursue a degree offered by a single institution or multiple institutions. Each university brings a unique strength to the

multi-institution academic programs. In a multi-institution program, a student is admitted at one institution and enrolls in courses at multiple institutions. Currently the Alliance is in its third year of offering a M.S. degree in Family Financial Planning. The FFP program provides an opportunity for Extension Educators to get their M.S. degree completely on-line in a CE-FCS priority area and eliminates travel costs and time. Other programs soon to be started are an M.S. degree in Gerontology, an M. S. degree in Youth Development, and classes supporting Home Economics Education programs. FFP program won two awards for its use of technology in education.

States Involved: CO, IA, KS, MI, MT, NB, ND, OK, SD, TX

Contact: Glenn Muske

Name of Planned Program/Activity: 4HCCS Entrepreneurship curriculum

Progress Report: 4-H curriculum developed, "Be the E: Entrepreneurship." Curriculum was piloted and released during the fall of 2004.

States Involved: WV, VA, FL, UT, MD, NC, MN, CSREES, OK, MO

Contact: Glenn Muske

Name of Planned Program/Activity: e-Extension Entrepreneurship Team

Progress Report: Formed in 2005 to respond to request for proposals, this team received one of the initial proposals to develop an e-Extension web site. Current efforts are being made to revise the proposal to respond to questions about our timetable and specific deliverables that will be done. First deliverables are due in 2006.

States Involved: NH, VT, NY, DE, WI, MN, IL, NB, TX, KT, LA, NV, ID, UT, OK

Contact: Glenn Muske

Name of Planned Program/Activity: National E-Commerce Advisory Comm.

Progress Report: Assists in developing outlines for national granting program and then determining grants awarded.

States Involved: UT, NM, MS, WV, MN, OK, PN, GA, NB

Contact: Glenn Muske

Name of Planned Program/Activity: Southern Region Entrepreneurship Planning Comm.

Progress Report: Assist in developing a regional listening session format and then to host such sessions. Hosts were then brought in to help develop a regional summary and then to work with national participants in deciding the next steps for a rural entrepreneurship effort. Work has also included efforts to host a E2 – Entrepreneurship and E-Commerce workshop and a Southern Rural Institute workshop.

States Involved: FL, GA, NC, SC, VA, TN, KT, AL, MS, LA, TX, AR, OK plus representatives from other regions

Contact: Glenn Muske

Name of Planned Program/Activity: National E-Commerce Pilot Project

Progress Report: This program utilizes funds from USDA provided to the Southern Rural Development Center. A national advisory committee has been formed and includes Extension professionals from OK, MS, PA, MN, UT, NB, GA, MI, WV, and NM. A competitive grants program has been offered to enhance existing or needed educational programs related to e-commerce to be offered by the Land Grant System. The committee reviewed 13 grant applications and funded five. The funded grants included the states TX, MN, PA, OH, and IA. Project PIs are asked to provide quarterly reports and the projects will be completed in mid 2006.

Contact: Mike D. Woods