FY 2000 Annual Report of Accomplishments and Results: Oklahoma Cooperative Extension Service

A. Planned Programs

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 farm and agri-business and financial management, improving domestic marketing concepts and alternatives, pest management, sustainable agriculture, commercial horticulture and alternative agriculture opportunities, natural resource management, value-added food and agriculture products, 4-H youth agriculture programs, and food safety related to production. This goal constitutes a very significant proportion of the OCES effort. Approximately 8,700 demonstrations, meetings and conferences (not including 4-H Youth) were conducted during the year. An additional, 40,000 visits and consultations were conducted by OCES personnel in agriculture-related programs. These activities were attended by 357,000 participants during the year (an additional 180,000 participants attended the youth activities). In addition, 13.4% of these participants were identified as representing non-white, minority populations as compared to 6.6% of the state's farms operated by individuals representing these populations.

One of the significant major program areas during the year was in beef cattle production and management. These programs included reproduction, cow-calf production, quality practices, marketing tools, beef production during drought, stocker production, feeding decisions, cattle pricing, nutrition, etc. Several of these programs are highlighted in impact statements in the "themes" section. Highlights include: the weekly "Cow-Calf Corner" on Oklahoma Educational TV network - this educational show reaches at least 85,000 viewers; the research and extension wheat-stocker team developed a decision-support microcomputer model for this enterprise that is a primary contributer to farm profitability in Oklahoma; "Cowculator" microcomputer program helps many producers improve net returns by letting them quickly incorporate the most economical feeds into their rations; workshops for Integrated Resource Management, forage production , and drought management helped the producers get the most out of their resources; and "Beef Quality Assurance', "Beef Quality Summit" and the integrated "Sale Barn Survey" were important tools resulting in improved product quality and financial returns to beef producers.

Approximately 200 farm families received financial management and planning assistance through the IFMAPS program. Just one impact of the program resulted in a $680,000 savings in reduced interest payments for 120 of these families. The use of under-priced feed commodities through Cowculator applications and educational meetings resulted in a $5 million cost reduction to the $3.3 billion cattle industry in Oklahoma. Oklahoma Proven resulted in an 81% increase in OKP plants sold as reported by one large nursery. Over 2,000 Oklahoma beef producers are beginning to report the positive impacts of improved practices as shown by recent Beef Quality Audit research - with data to be available next year on the overall impact. Cotton production education and Cotton IPM education played an integral role in the increase in production in the five north central counties - resulting in an increase from 900 bales in 1996 to 12,800 bales in 1999. Oklahoma Cooperative Extension employees of the Food and Agricultural Product Center and the county extension educator played a vital role in the development of "Value Added

Products, Inc." - a $18.5 million closed cooperative venture owned by producers in north central Oklahoma. It began production of frozen dough products in October 2000. Presently over 47 people are employed at the plant and employees are still being hired. Conservative predictions indicate sales should exceed $15 million in 2001. Grain sorghum production trials, demonstrations and educational programs played a significant role in the 21% increase in acres planted in north central Oklahoma from 96,000 acres in 1997 to 116,000 acres in 1999. The "Northeast Oklahoma Calf Marketing Demonstration helped 15 producers earn an average of an extra $15 per calf for 215 calves sold. This was a 24% return on investment in weaning and preconditioning in one market year. The "Oklahoma Statewide Alfalfa email Advisory" and related educational programs resulted in a significant decrease in applications of insecticide for alfalfa weevils and aphids. Over a ten-year period, there has been a 40% decrease in applications per acre per year representing about a $3.8 million per year savings to growers. In addition, the reduction in use means a positive impact on the environment and health of applicators.

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 $8.8 million with $1.5 million from Smith Lever funds. About 116 professional and paraprofessional FTEs contributed to the goal last year.

Goal 1 – Key Themes

Key Theme: Adding Value to New and Old Agricultural Products

Title: A Guide to Starting Your Own Food Business

Issue:
To provide prospective entrepreneurs with basic knowledge needed to make informed decisions before they invest capital in a new food business. People looking to start up a food business have wide ranges of general business knowledge and expertise as it relates to production needs. Thus, programming needs to be flexible enough to answer specific questions/needs while ensuring overall general knowledge goals and objectives are met at the same time.

What Has Been Done:
The Food and Agricultural Products Research and Technology Center offers a monthly workshop to food business entrepreneurs titled "Basic Training: A Guide to Starting Your Own Food Business." The program is marketed through the county offices of the Oklahoma Cooperative Extension Service (OCES), Oklahoma Career Technology Small Business Assistance Program, Chambers of Commerce, Kerr Center for Sustainable Agriculture, Rural Development Team of OCES, Oklahoma's two State Fairs, through many public speaking opportunities and by previous workshop attendees.

Impact(s):
Nearly 180 entrepreneurs have taken advantage of the program, learning about business plan development, market evaluation, patents and trademarks, labeling and UPC code requirements, health regulations, liabilities and legalities, and the Oklahoma Department of Agriculture's "Made in Oklahoma Program." Plans are underway to develop a biannual Financial Management Workshop designed to assist the many "basic training" attendees who are now seeking information to expand their businesses further.

Funding Sources: State Appropriations

Scope of Impact: State Specific

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Title: Particleboard Manufacture From Eastern Redcedar

Issue:
Eastern redcedar (Juniperus virginiana) is one of the most widely distributed indigenous conifers in Oklahoma. Low value and the irregular growth pattern of eastern redcedar make this species inefficient as a raw material for lumber manufacturing. Currently the wood from eastern redcedar is used for fence posts, shingles, chests, mail boxes and bird houses while the tree themselves may be planted for windbreaks and shelterbelt. Eastern redcedar is a problem on grassland primarily because it reduces forage production. The challenge is to produce a value-added composite panel from whole-tree chipping of eastern redcedar that may result in the development of an environmentally sound way to utilize this resource.

What Has Been Done:
Experimental boards were made from the whole tree chipping of eastern redcedar under laboratory conditions. Test results revealed that both physical and mechanical properties of the samples are comparable to any board made from their species. To our knowledge there has been no other study investigating the feasibility of manufacturing particleboard from whole tree furnished of eastern redcedar.

Impact:
The importance of this work lies in its potential to expand the use of low quality eastern redcedar in composite panel manufacture. There is an interest in this product from various mid-size manufacturers in Oklahoma. A patent has been applied for and it is pending at this time.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Establishment of a "New Generation" Cooperative to Process Oklahoma Wheat

Issue:
Excited by producer-owned ventures in the Upper Midwest, a group of Woods County wheat farmers and representatives from four farmer cooperatives dedicated themselves to examining opportunities to process Oklahoma's hard red winter wheat. The producers and cooperatives had two vital objectives: (1) see if producers would invest in a food processing venture that would use hard red winter wheat from Oklahoma, and (2) establish any resulting processing venture in Alva, Oklahoma (Woods County seat). The first objective was meant to provide Oklahoma wheat farmers with an additional source of income derived directly from their wheat. The second objective was determined to create jobs in Woods County, where the population and per capita income have been declining for over a decade.

What Has Been Done:
Dr. Rodney Holcomb (Extension Economist, OSU Food & Ag. Products Center) began working with the group in 1998 to evaluate wheat-based processing opportunities such as commodity flour, tortillas, pasta, fresh-baked products, and pre-proofed frozen dough. Once the group decided in 1999 to develop a closed cooperative to manufacture pre-proofed frozen dough products, Dr. Holcomb helped the group develop a business plan, while Robert LeValley (Woods Co. Extension Office) helped with multimedia presentations to explain the proposed venture to other Oklahoma producers. Both Holcomb and LeValley met with groups of interested producers, cooperative managers, and agricultural bankers/lenders across Oklahoma in late 1999 to explain the structural nature of closed cooperatives, state tax incentives for producer-owned value-added processing ventures, and market trends and projections for frozen dough products.

Impact:
To date, over 750 agricultural producers have invested a minimum of $5,000 each into the resulting business entity, Value Added Products Inc. The closed cooperative has gathered over $9.5 million for the $18.5 million venture, and USDA-secured financing has been arranged with three banks for the remainder. Small scale production began in March 2000 and full scale production began in October 2000. The operation currently employees 47 individuals from Woods County and the surrounding region, and at least 20 more employees are being hired for a third shift. A second processing line is planned for 2003. Conservative predictions from earlier this year indicated sales for VAP in 2001 will exceed $15 million.

Funding: State

Scope of Impact: State Specific

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Key Theme: Agricultural Competitiveness

Title: Using the Oklahoma Mesonet as a Management Tool in Agriculture and Natural Resources

Issue:
The importance of weather in agriculture and natural resources has been well documented. Weather impacts the production of a particular crop during the growing season by controlling its phenological development and influencing the yield; insect pests and diseases that affect yield are also influenced by weather conditions. Additionally, heat and cold stress can negatively affect livestock production. Other examples where weather is crucial include daily water loss from a given crop, drying conditions for hay, fire danger, and atmospheric pollutants (including smoke, animal odor, pesticides, etc).

What Has Been Done:
The Oklahoma Mesonet, the state's automated weather station network, has been operational since 1994. A joint project of the University of Oklahoma and Oklahoma State University, it consists of over 110 stations, separated by an average distance of 19 miles, and reports weather and soil information every 15 minutes. The data is received in Norman, OK, and posted on the Internet minutes thereafter. Since 1996, a variety of value-added products for agriculture and natural resources have been developed and implemented on the Oklahoma Mesonet system. Certain insect and disease models have been developed, in conjunction with OSU entomology and plant pathology specialists, to assist the grower in making pesticide application decisions. Insect models include those for alfalfa weevil and pecan nut casebearer. Disease models include those for peanut leafspot, pecan scab, and watermelon anthracnose. In addition, an evapotranspiration model for use in irrigation scheduling has been developed and has a model to assess and predict atmospheric dispersion conditions for pollutants. Finally, an internationally recognized fire danger model has been operational since 1996; this was developed in conjunction with the US Forest Service. In addition to these models, there are products depicting weather and soil information every 15 minutes, as well as value-added 60-hour forecasts. Besides these agriculture and natural resource thrusts, the Oklahoma Mesonet has been used in K-12 educational outreaches, by the National Weather Service and other weather bureaus for more accurate forecasting, as well as other agencies such as civil defense and emergency management.

Impact(s):
Mesonet-based management tools for agriculture and natural resources are easily available on the World Wide Web (http://agweather.mesonet.ou.edu). Having a number of management tools readily available on the Web, growers and others can utilize the latest Mesonet weather information to assist in making wise management decisions. In the case of the insect and disease models, a certain number of pesticide applications may be saved during the growing season that, under a calendar-based system, might ordinarily be applied. These models also help in proper timing of those sprays that are needed. The Oklahoma Fire Danger Model is used extensively by state wildfire specialists and the Forestry Division of ODA in assessing fire danger conditions, declaring Red Flag Fire Alert days, and recommending burning bans. The model is also used by those planning and conducting prescribed burns. Other models and data products are used for assessment of evapotranspiration conditions, dispersion conditions, atmospheric inversion conditions (useful for frost protection schemes), and conditions suitable for planting and harvesting. In addition, the data itself is used for research, extension, and instruction purposes across the state. Various web pages and products are used in K-12 education, by the National Weather Service, and by civil and emergency managers (the "OK-FIRST" program). Other web

pages have been developed by our colleagues in Norman to assess rainfall across the state and depict a variety of climatological information (30-year averages and extremes).

Funding Sources: Hatch; Smith-Lever; State

Scope of Impact: Integrated Research and Extension

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Title: Oklahoma State University Packer-Feeder Game

Issue:
The OSU Packer-Feeder Game is simplifying teaching and learning about the complex fed cattle market--and making it fun for college students, ranchers, and corporate executives alike.

What Has Been Done:
The OSU agricultural economists and developers of the game say that trading fed cattle requires understanding a daunting amount of complex concepts. Examples include: supply and demand, price discovery, market dynamics, break-even analysis, derived demand, production efficiency, economies of size, hedging and risk management, and industry structure-conduct performance. Yet, keeping a competitive edge in the industry requires understanding these concepts as well as the human dynamics in the marketplace.

The OSU team members combined expertise and stacks of information to develop a Fed Cattle Market Simulator, now more popularly called the OSU Packer-Feeder Game. Their one-of-a-kind computerized game is for adult groups of 24-48 people, who divide into "Packers" and "Feeders" and then trade places. The game must be facilitated by two or more agricultural economists who lead the program and field constant questions that emerge from the game's multiple teachable moments. While four- to six-hour sessions are most common, the simulator program has accommodated a couple of hours with a high school group and up to two-day sessions at large agribusiness corporations. For all, the game simulates the daily trials of cattle feeders and beef packers interacting with each other as they buy and sell.

Impacts:
The game made an early hit with college students, who choose it over a standard lecture every time. And as more people already in the business play the game, more base market decisions on information rather than emotions. They like it, too.

Producers from across Oklahoma and several neighboring states who have attended OSU Packer-Feeder workshops market an estimated two million fed cattle annually. Cattle account for approximately half of all farm cash receipts in Oklahoma and adjacent states. Agribusiness managers from such companies as Excel and Continental Grain Cattle Division who have attended Packer-Feeder workshops represent the purchase of an estimated five million cattle annually. Cattle producers and educators from other states who have requested and received

workshops represent Texas, Kansas, Michigan, Tennessee, Florida, Colorado, Utah, Iowa, and Kentucky. Some have since purchased equipment and software to make the game available on a continuing basis.

A group of non-English speaking educators from Poland played the game successfully while experiencing free market concepts for the first time. Other participants say the game:

"Gives as close as possible real world examples and it is fun!"
"Lets me see inside feedlots and the packer industry without paying real money."
"Taught how the market could fluctuate and change, but the instructors could show and tell why the changes might be occurring and what some people could do about it."
"(Demonstrates) that both sides at times work on small margins or losses."
"Teaches basics of market behavior, psychology, and how 'small' decisions at one time have large consequences later."
"...I would like you to do this for my county a nd my cattlemen's association."
"...It opened my eyes. I am extremely interested in playing this game again!"

Funding: Hatch; Smith-Lever; State

Scope of Impact: Multi-state Integrated Research and Extension

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Title: Ag in the Classroom Curriculum and Summer Institute Teaches Teachers to Teach Agriculture

Issue:
Each generation of Americans is more removed from agriculture and the issues related to agriculture and the environment. The goal of the Oklahoma Ag in the Classroom program is to use an interdisciplinary approach to teach school children and their teachers more about the world around them. This goal is achieved by using agricultural concepts to teach basic core subjects in mathematics, science, language arts, reading, information skills, and visual arts in grades K-2, 3-4, and 5-6. Ag in the Classroom curriculum is developed by the 4-H Youth Development program of the Oklahoma State University Division of Agricultural Sciences and Natural Resources. Teachers who are interested in incorporating these lessons into their teaching have the opportunity to attend the Ag in the Classroom Summer Institute, which familiarizes them with the curriculum and generally expands their perceptions about agriculture.

What Has Been Done:
The Oklahoma Ag in the Classroom Summer Institute, having completed its fourth year, seeks to expand kindergarten through sixth-grade teachers' perceptions about agriculture. The institutes seemed to be making a positive impact on the perceptions and knowledge held by the teacher participants, but an objective assessment was necessary to allow program coordinators to make adjustments to the program to best meet the needs of the participants. A pre-test of attendees at the in-service institute indicated that 59 percent defined agriculture as being primarily farming

and ranching. Following the institute, a post-test showed that 67 percent of the teachers in attendance recognized that agriculture is much broader than farming and ranching.

Impacts:
Teachers tend to teach topics with which they are familiar and comfortable. Following the institute, 100 percent of the teachers reported an increased level of knowledge. Additionally, 26 percent of the participants expanded their definitions of the term "agriculture." If the expanded perception is transferred to their teaching, students also will develop an expanded perception of agriculture beyond farming and ranching.

Numerous teacher comments have ranked the Ag in the Classroom Summer Institutes as being among the most valuable in-service sessions they have attended in their careers. In fact, 100 percent of the participants indicated a willingness to "strongly recommend" future institutes to their colleagues.

Funding Sources: Smith-Lever; State

Scope of Impact: Multi-state Extension; National

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Key Theme: Agricultural Profitability

Title: **Increasing Profitability of the Wheat/Stocker Cattle Enterprise**

Issue:
Winter wheat pasture is a very unique and economically important renewable resource in Oklahoma and the southern Great Plains. Income is derived from both grain and the increased value that is added, as weight gain, to growing cattle. This research and education initiative focuses on the issue of economic well-being and survival of many rural communities in Oklahoma and the southern Great Plains of the United States. The challenge is to conduct research and provide scientific data that will 1) improve efficiency of production and increase profitability of the enterprises, and 2) decrease production risk and income variability from the enterprise and thereby increase growth of the industry.

What Has Been Done:
A monensin-containing energy supplement for hand feeding every other day to wheat pasture stocker cattle has been developed. The supplementation program has consistently increased daily weight gain of growing cattle by about 0.5 pound, and has increased profits by $15 to $31 per animal. At a technology adoption rate of 30 percent, total profit from wheat pasture stocker cattle in Oklahoma could be increased by $11.3 million per year. Grazing trials have been conducted with six hard red winter wheat varieties at four stocking rates. Differences in net return from cattle plus grain have been as large as $61/acre. Stocking rate has had a much greater and more

consistent effect on growth performance of stocker cattle than wheat variety. A decision-support microcomputer model (Wheat and Wheat-Stocker Production Planner) for analyzing the profitability of grain only, dual-purpose, and grazing only enterprises has been developed for use by producers and extension educators.

Impact(s):
The potential of this project for improving the economies of many rural communities in Oklahoma and the southern Great Plains is enormous. Annual income in Oklahoma could be increased by $131 million by improving the technical efficiency of production of the 1.5 million stocker cattle that are grown to heavier weights on wheat pasture in Oklahoma prior to being finished in feedlots. This research has similar potential impacts on the 5.5 million wheat pasture stocker cattle in the states of Texas, Kansas, New Mexico and Colorado. By improving the technical efficiency and increasing the number of cattle that are grazed on wheat pasture in Oklahoma, annual income in the state could potentially be increased by almost $308 million. Also, the prospects for winter wheat pasture greatly influence the market for most of the fall-weaned beef calves in the United States. The Pacific, Mountain (excluding Colorado and New Mexico), Appalachian, Southeast, and Delta States are all net exporters of their annual calf crops. Many of these calves are grown to heavier weights on winter wheat pasture in Oklahoma, Kansas, Texas, Colorado, and New Mexico.

Funding Sources: Hatch Act; Smith-Lever; State

Scope of Impact: Integrated Research & Extension

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Title: Sale Barn Survey

Issue:
The purpose of the survey was to determine characteristics affecting the value of cattle sold through livestock auctions in southeastern Oklahoma. Some factors affecting profitability of beef cattle operations in southeastern Oklahoma are out of the control of the cattleman. These include supply and demand, environmental factors such as moisture, drought, etc. Other factors such as improved sale prices, can be controlled by the producer. The majority of stocker cattle sold in eastern Oklahoma pass through local livestock auctions. Since this is a common practice, there was a need to determine financial incentives for management that results in cattle of increased value to the market place and subsequent increased profit for those producing improved calves and increased tax revenues from those profits. While it has long been common knowledge that certain management practices affect the selling price of cattle, there has been little "unbiased, research-based" data to verify the extent of premiums that might be paid for these improved management practices.

What Has Been Done:

Extension Educators came together for a one-day in-service at McAlester Union Stockyards. Personnel from Kansas State University trained educators in methods of determining the extent to which certain cattle possessed certain traits including breed, body condition, fill, etc. Having been schooled and in a sense, calibrated, educators were assigned an auction market from which to collect data. The data was collected, statistically analyzed and presented at numerous meetings across the state. Also, the data has been widely published in trade journals and magazines across the nation.

Impact(s):
The information generated is of interest and value to beef cattle producers throughout Oklahoma and the country. The data has, in some instances, been in conflict with what many would consider common knowledge and the benefit of certain characteristics was undervalued relative to the data. Much anecdotal information has been disproved or shown to have a basis in fact due to this effort. This information, and the accompanying educational activities fit nicely with the emphasis on and producer interest in value-added products and vertical integration. The economic value of this study is difficult to determine, however, if utilized, the data should result in very significant improvements to profitability of most beef cattle operations in Oklahoma. The increased improvement in profitability also translates to increased tax revenues for the state. The efforts of those involved in the sale barn study have achieved much for OCES clientele, and OCES.

Funding: Smith-Lever, State Appropriations

Scope of Impact: State Specific

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Title: **Beef Quality Summit**

Issue:
To increase the economic return a beef producer receives for each animal. The challenge is to get beef producers to make any identified, necessary changes in their operations to promote economic viability.

What Has Been Done:
Oklahoma State University animal and meats scientists put together a 2.5 day hands-on, consumer-focused program that employs the educational precepts of doing and showing as well as lecturing.

Impact(s):
The BQS program helps participants to identify first-hand information as to beef herd and operational management areas that require change in their specific operations. Registration per summit is limited to 30 individuals, to ensure that each participant receives adequate hands-on teaching and training opportunities.

Funding Sources: Smith-Lever; State Appropriations; OBIC

Scope of Impact: State Specific

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Title: Northeast Oklahoma Calf Marketing Demonstrations

Issue:
- 290,000 beef cows in NE Oklahoma
- 92.2% of farms with cattle are in herds of 99 head or less
- Small cow/calf operators (50 cows or less) are limited in marketing options and do not receive total value possible from their calf crop
- Limited lot size when selling calf crop restricts price
- Lack of uniformity of calf crop between cow/calf operations
- No uniformity of management of calf crops between operations

What Has Been Done:
- County PAC identified marketing problem of small cow/calf operations
  -Lot size of calves sold
  -Lack of uniformity of calf crop
  -Lack of vaccination and weaning
  -Means of credibility (reputation) of calf management
- Form NE Oklahoma Calf Marketing Demonstration
  -Develop guidelines for participation
  -Bull selection, preconditioning guidelines, selling methods
- 750 beef cows represented
- Two tours, farm and preconditioning tour
- All calves inspected by OCES committee

Impact:
- 750 cows, 15 producers
- 136 calves marketed as a group first year
- 78 calves marketed second year
- Repeat buyer wants more NE Oklahoma Calf Market Association

Producer (cow/calf)

- Uniform product between small producers
- Sell more product
- More profit to producer
- Price setter, not a price taker
- Improve management of beef cow herd and cooperation between small producers
- System in line, ready for down turn in cattle cycle
- $15 net additional profit to producer, 24% return on investment on weaning/preconditioning on a high cattle market first year cattle grouped and conditioned

Feeder (fat cattle)

- Competitive cost of gain in feedlot
- More profit per head on NE Oklahoma Association Calves ($124/head, $50 over similar cattle at that time)
- 13 months of age, 47.7% choice grade, 93% yield grade 1 & 2

Industry

- Uniform product from small producers
- End product description
- End product brand name
- Alliance developed for small producers

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Fed Cattle Pricing

Issue:
How to evaluate grid pricing of fed cattle and identify and measure pros and cons associated with grid pricing.

What Has Been Done:
A three-person team of agricultural economists collected data from meatpackers and feedlots. Data were analyzed from several perspectives. Grid pricing has advantages for producers of good quality cattle. However, cattlemen must know how final price is calculated by using the grid. Cattlemen also must know the quality of their cattle. There are risks with grid pricing. Discounts received for just a few poor cattle can offset the premiums received for many head of high quality cattle. With grid pricing, cattlemen bear added risks, i.e., the quality risks with their cattle. However, with added risks comes the possibility of higher returns. Research showed significant returns from know-how about cattle quality and yield grade in carcass form. One

serious problem with grid pricing is the source of the base price for the grid. The current, most common base prices have significant negative impacts for price discovery.

Impact(s):
This program is an essential step in the transition of how fed cattle are priced. As the industry searches for how best to price cattle on a value-based method, research is needed to assess potential advantages and disadvantages. Research such as this project contributes to improved understanding of grid pricing and the associated pros and cons. For some cattlemen, grid pricing clearly can lead to higher prices and profits. However, for others, changes are needed before such benefits can be realized.

Funding Sources: DASNR-TRIP; Research Institute on Livestock Pricing, Virginia Tech University

Scope of Impact: Multi-state Integrated Research & Extension – NE, KS, VA

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Key Theme: Animal Health

Title: Nitrate Testing in Northwestern Oklahoma Counties

Issue:
Corn, forage sorghum species, grain sorghum stalks, Johnson grass, wheat and some weed species that are consumed by cattle routinely accumulate nitrates when under environmental stress. These stress conditions range from cold, wet, cloudy weather, hail, drought, and extreme heat. Actually, any conditions that disrupt plant metabolism predispose the plant to nitrate accumulation. Nitrate levels in excess of 8-10,000 ppm are deadly to cattle under many conditions. The qualitative diphenylamine test is used in the field to estimate the potential for toxicity. In the event toxicity is suspected, samples are sent to a diagnostic lab for quantitative analysis to determine actual nitrate levels.

What Has Been Done:
Extension County Educators have diphenylamine available to take to the field and test forage for clientele. In the event samples have been found to be toxic, feeding regimes are recommended utilizing blending and incorporation into diets with a high starch content to dilute the toxic nitrates levels to levels that may be safely fed to cattle.

Impact:
County Extension Educators in the Northwest conducted hundreds of tests during this past year that saw the extremes in environmental conditions. This began with spring hailstorms and culminated with the extremely high temperatures and drought of late summer. Corn circles receiving hail had the canopies broken and pigweeds proliferated. Nitrate levels as high as 38,000 ppm were observed. This feedstuff was blended into the ensilage pit with non-toxic

material. Ensiling also decreases toxicity. The corn plant routinely shuts down metabolism at about 95 degrees F. Since nitrates are higher in the stalk nearer to the ground, harvest was targeted more toward the cooler part of the day and cutter height was raised when cutting during the heat of the day. Custom cattle feedlots continue to be ever alert to the quality of the feedstuffs that are incorporated into the diets. When as many as 300,000 head of cattle at any one time that may be affected, diligence pays.

"Hay grazer" forages are routinely harvested for winter supplements. The extreme heat stress this past summer had producers testing more samples than in more normal years. Many more milo stalk fields were also sampled as a source of winter forage. A recent consequence of not checking forage was that one "big round bale" killed 7 cows and a total of 31 fetuses were found aborted 24 hours after feeding. It is noteworthy that a significant snowfall covering available forage had taken place and the cattle were hungry. This underscores the idea that it may pay to check!!

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Key Theme: Animal Production Efficiency

Title: Oklahoma State's Cow-Calf Corner Offers Producers Information at Their Convenience

Issue:
Even producers who have been in the cow-calf business for years know there's always another bit of information they need. But they can't always be tied to the TV or at meetings when the information is offered.

What Has Been Done:
Glenn Selk, OSU Extension animal production specialist, began giving some of that information in 1993 on Tuesday Cow-Calf Corner segments on SUNUP, Oklahoma Cooperative Extension's weekday TV broadcast on educational channels. But as computer technology has expanded, Cow-Calf Corner has grown, too. Producers who can't or don't choose to watch the show at 7 a.m. with the program's 85,000 - 100,000 viewers can turn on the computer any time of day or night, do a net search for "Cow-Calf Corner", and see the current segment in quick-time video with sound.

But that's not all. The web site also offers upcoming topics, other resources to look for more information, as well as archives for 120 different cow calf management topics already discussed. Links throughout direct users to more resources such as fact sheets, county Extension offices, and Selk and his colleagues at Oklahoma State and sometimes other states as well.

Impact(s):
A producer from Asher, OK wrote: "SUNUP is the quickest way to get agricultural bulletins or information spread over the whole state. My favorite part is Cow-Calf Corner since my major product is beef calves. Cow-Calf Corner always gives timely information that needs attention at the time of season that it is now--not too early or too late. I would like for more time to be available sometimes to explain some problems and solutions in more detail."

Selk explains that "In television, time limitations can be extremely tight. Occasionally, we would like to go into a subject in more detail. Now, with our web site, we can do just that for viewers who want more. It's like peeling the layers of an onion," he says. "Depending on the amount of information you want, you can just go deeper and deeper into OSU's web resources." Many producers tell Selk they like the consumer convenience-- information at will. They appreciate pertinent information immediately when weather or other conditions change their lives and livelihoods.

For example, a Duncan, OK producer emailed Selk, "Thanks for the info. The 'Corner' is a great site and is now bookmarked. Concerning the Limit Feeding, we have been doing this since the article appeared in the 'Cowman'. It's too early to tell about effects of conditioning, but it sure helps stretch our hay supply. Obviously, this is important in most years, but this year it's downright critical." The Cow Calf Corner website is averaging 299 hits and 72 user sessions per day. The user sessions averaged 15 minutes and 26 seconds in length.

Funding: Smith-Lever; State

Scope of Contact: State Specific

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Title: **Beef Cattle Nutrition and Management**

Issue:
Providing balanced nutrition to cattle through forages, feed grains, oilseeds and other feed sources has a tremendous effect on reproduction, beef product quality and profitability in all phases of Oklahoma's cattle industry, the fourth largest in the United States in terms of total cattle numbers. The challenge is to help beef producers understand how to increase profitability and/or reduce cost of production through improved forage utilization, defining optimal supplementation practices and understanding the influence of genetics on nutrient requirements.

What Has Been Done:
An ongoing extension program was developed to provide cow/calf producers the information and tools needed to evaluate nutrition programs and reduce costs. A decision-making tool was developed in the form of a computer software package and complete educational material package called OSU Cowculator. The package included the software, slide set with suggested

text, and a fact sheet. A web site was maintained to educate producers on the use and availability of uncommon and often under-priced feeds. Applied research was conducted to investigate ways to take advantage of these under-priced feeds in beef production. An educational packet, complete with slides and handout was developed to assist producers in the use of byproduct feeds, particularly during periods of drought.

Impact(s):
More than 2,500 versions of Cowculator have been distributed. In addition, nine land-grant institutions are using the software in their beef production courses. Use of under-priced feed commodities has increased nearly twofold in Oklahoma in the past three years. Part of this dramatic increase has been caused by changes in market conditions and extreme drought in some parts of the state. Many producers have been able to use the Cowculator to survive and even make a good profit in an otherwise severe production and economic situation. Estimated total impact is more than $5 million.

Funding Sources: Smith-Lever; State

Scope of Impact: Integrated Research and Extension

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Title: Integrated Resource Management (IRM) for Beef Producers

Issue:
The challenge is to identify management practices that increase the viability of farms and ranches producing beef.

What Has Been Done:
Farm operators are being made aware of record-keeping tools for assessing effectiveness and sustainability of management practices. Cow-calf Standardized Performance Analysis (SPA) and Quicken® software is used and demonstrated with individual producers and agricultural professionals, along with other IRM concepts and decision-making tools. Instructions for using Quicken for farm financial record keeping are being updated annually for new releases of the software. New software to focus on the affordability of part-time ranching has been developed as has a prototype model to identify profit-maximizing forage/livestock systems in Oklahoma. Educational programs include intensive "hands on" workshops, demonstrations, publications, and materials on the WWW. Gaps in tools available to support decision-making need continue to be identified. New software that appears likely to facilitate IRM analysis and decision making is being evaluated and/or developed and added to workshops
when appropriate. Educational materials are being modified to reflect lessons learned through field experience and case studies.

Case studies are summarized in a thesis, " Evaluation of Integrated Resource Management Skills of Beef Cattle Producers Using the Case Study Method." The case studies confirmed that producers, due to differences in soil resources, managerial expertise, or capital constraints, have different limiting factors. Interdisciplinary teams visited farms, helped participants assemble financial and production data, and discussed potential changes in practices. Details about management structure, goals, enterprise mix, information system components, personal characteristics of farm managers, inventory of farm resources and production levels, and the manager's perception of farm risks were noted. Case study data were examined to identify production and information practices that could benefit other farms. The interview package has been adapted for use in several other projects.

Information exchanges are being conducted periodically. The forums allow producers (or advisors) the opportunity to share ideas and experiences concerning various aspects of integrated resource management. The producer information exchanges focus on a limited number of topics--for example, marketing alternatives, grazing management, herd health practices--identified in advance. The emphasis is on participants learning from each other and researchers learning from participants. Thus, the forums suggest research and education needs and serve as a basis for future dialogue among beef producers, educators and researchers. Similar formats have been used for an information exchange for producers, veterinarians and accountants. Both producers and educators voiced a need for a publication to provide prospective beef producers with realistic expectations of resource and management needs. A draft of "So, You Want to Be a Rancher?" has been completed and will be finished in the coming year.

Impact(s):
Investigators are capitalizing on ongoing, related efforts through cooperatively planned activities to benefit all beef producers, small and large, with integrated, interdisciplinary programs and materials. In addition, agricultural advisors such as accountants and veterinarians are being offered training to familiarize them with managerial concepts outside their traditional areas so that they can better assist producers. Expected outcomes of the project include greater adoption of technological tools, improved on-farm information systems, and greater understanding of IRM concepts with increased feedback to researchers on high priority needs. Researchers have developed a better understanding of the interdisciplinary nature of problems facing producers and have identified additional research needs. Producers have become aware of software tools to support their decision-making. The tools have saved them both time and money in some cases.

Funding: Smith-Lever, State Appropriations, Southern SARE

Scope of Impact: Multi-state Integrated Research and Extension – AL, TX

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Title: **Beef Quality Assurance**

Issue:
To get Oklahoma beef producers to use recommended techniques related to cow herd management, proper herd health management, and targeted breeding for customer satisfaction of the end food product (meat). The challenge is to help beef producers understand quality and

consistency issues related to the end product essential to enhance beef's marketplace competitiveness.

What Has Been Done:
Oklahoma State University Cooperative Extension specialists from the Department of Animal Science and College of Veterinary Medicine presented the Beef Quality Assurance producer education program 50 times between February 1999 and December 2000.

Impact(s):
The BQA program has been well received by more than 2,000 beef producers who have attended the 50-plus presentations across Oklahoma. BQA is presented as a three-part program using beef quality research and information from the 1995 National Beef Quality Audit of beef packing plants. Meeting surveys have indicated participants have viewed the program as extremely educational and informative. Written comments have expressed that the program has helped to promote understanding of why beef cattle injection sites should be moved from the rump to the neck, the need to follow drug and vaccine labels more carefully, evaluation of animals for potential carcass yield and quality grades, and the need to follow industry/scientific recommendations on cow herd culling.

Funding Sources: Smith-Lever; State Appropriations

Scope of Impact: State Specific

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Title: Breeding Soundness Examination Program

Issue:
The Ram Breeding Soundness Examination Program is an ongoing program that was developed to help producers decrease the incidence of Ram infertility and Eppididymitis in sheep producers' flocks. Ram infertility and Eppididymitis can decrease lambing percentages by up to 15 %, increase open ewes by 5% and cause a need for an increased ram to ewe ratio in producer flocks. Removing Eppididymitis, infertile, and subfertile rams from a sheep producer's flock can substantially increase the profitability of the sheep enterprise.

What Has Been Done:
Initially, this program was a joint effort with the OSU Veterinary Hospital to train local Veterinarians in proper procedures to conduct Ram Breeding Soundness exams. Breeding Soundness Examination "Clinics" were held statewide, at local Veterinary clinics to assist local Veterinarians in performing the BSE's. This effort allowed on the job training of local Veterinarians by OSU Vet Hospital Veterinarians on proper BSE Techniques. Since 1996, local Veterinarians, County Extension personnel and the OSU Sheep Specialist conduct the annual BSE Clinics.

Impact:
Approximately 750 rams are evaluated annually. With increases in lambing percentages, decreases in open ewes and an increase in the ewe to ram ratio. It is estimated that the Ram Breeding Soundness Examination program have increased the profitability of Oklahoma sheep flocks by approximately $250,000 annually.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: International Equine Judges School

Issue:
The equine production and use sector of exhibitions create large economies for Oklahoma, the U.S. and international countries. In addition to the economy created by participant's producing and training horses, local communities rely on revenues generated from these exhibitions. Estimates from Oklahoma City and Tulsa Chamber of Commerce suggest equine exhibitions generate over 20 million dollars to these cities economies. Officials of exhibitions must receive certification and continuing education. Individual horse industry associations have stressed a need for more uniformity in officiating and a need for pooling resources for certification and continuing education programs. Benefits of organizing a central testing site and school provides an opportunity for horse exhibition organizations to share resources, interface with one another in common areas of needs and expand organization services into other areas including association management and animal welfare.

What Has Been Done:
A council of representatives from major horse exhibitions was organized to develop the certification school for judges. The program is in its 10th year. In 2001, 12 major horse associations participated in the International Equine Judges School. The seminar is held annually in Oklahoma City and has developed into a 2-week activity. Oklahoma State Extension interfaces with the council by leading organizational needs for educational workshops, developing and administering testing material and supervising on-site video and live animal testing. Attendance in 2001 included 200 new applicants for officiating privileges in one or

more of the organizations and 400 officials renewing certification with one or more of the organizations.

Impact:
Since its inception the school has certified over 1000 officials for equine exhibitions. The school has provided a mechanism for the independent organizations to interface and work toward common goals of promotion and development of the horse industry. The school has provided the mechanism to standardize rules and regulations among the different organizations. The officials annually represent the organizations in thousands of exhibitions across the world. Horse industry organizations have reported an increase of participant confidence and participation at equine activities in recent years, partially indicated as a result of increased standards of officials.

Funding: State

Scope of Impact: State Specific

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Title: DairyLines: Dairy Industry Newsletter

Issue:
The Extension Service needs a means to communicate with commodity and industry groups on a regular basis to provide educational and program information to stakeholders and to establish and maintain the Extension Service as the resource for unbiased, research based information.

What Has Been Done:
Since 1997, Oklahoma State University and Kansas State University have produced a joint monthly publication called "DairyLines" for producers in Oklahoma and Kansas as well as allied industry personnel across the country. Articles within each issue provide producers with current information pertaining to operating a dairy business within the south-central US. Additionally, commodity price information as well as Extension programs and industry activities are included in each issue.

Impact:
Articles have generated producer interest in establishing new and improved management practices and have helped to establish working relationships that might not otherwise have occurred without the newsletter. An additional benefit from this program is the ability to provided Area, District and County Extension personnel within each state educational material as part of an ongoing in-service training.

Funding: Smith-Lever, State

Scope of Impact: Multi-state; KS

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Title: E-HERDS (Extension Helping Establish Resources for Dairy Success)

Issue:
Traditional media (i.e. newsletters, magazines) cannot provide the timely information concerning market activities needed by today's progressive dairy producer. In order to manage price risk on both sides of the equation producers must keep up to date on market forces not only locally but also nationally and internationally. Avenues to provide time sensitive material to producers must be exploited in order to continue to be a meaningful and useful resource to stakeholders.

What Has Been Done:
In 2000 an e-mail database of Oklahoma dairy producers and other interested parties, including county extension personnel and allied industry partners, was established to provide time-sensitive dairy market and feed commodity price information. Information is received on a weekly basis from Texas A&M Extension Economist Robert Schwart and Penn State University Dairy Marketing and Policy Associate Professor Ken Bailey and redistributed to participants. Additional alerts and advisories concerning milk marketing and dairy industry policy are distributed when received.

Impact:
As of January 1, 2001 a total of 45 producers receive information two times each week. This group represents approximately 10 percent of dairy farms and 20 percent of the dairy cows in Oklahoma.
A producer from Tishomingo, OK, wrote "Just wanted to thank you for sending the info. It's nice to be able to just glance at the computer and not have to wade through piles of magazines for really good, useable stuff"

Funding: Smith-Lever, State

Scope of Impact: Multi-state; TX, PA

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Key Theme: Diversified/Alternative Agriculture

Title: Extending Oklahoma Cotton Production into New Production Areas

Issue:
Due to development of shorter season cotton varieties, it has become possible to produce cotton in areas that have not been involved in cotton production. Cotton production provides an attractive and profitable rotation for producers in the Northern Oklahoma and Southern Kansas areas. OSU Extension was challenged to provide cotton production information to a large number of growers with no cotton production experience and to do this in a very short period of time.

What Has Been Done:
Initial contacts were made through county educators to OSU Extension Cotton Specialists and Extension Entomologists. Meetings were arranged with groups of interested farmers, and their first year production activities were closely monitored by the Extension Cotton Specialist, Extension Entomologist, and Area Specialist and in turn row meetings were scheduled each 1-2 weeks during the growing season. Success of this core group rapidly expanded cotton acreages in their area – going from 4,500 acres planted in 1997 to 20,800 acres planted in 1999. OSU continues to be the primary information source to producers.

Impact:
After 3 years, cotton acreage in this area has grown to approximately 45,000 acres and continues to expand. Two new cotton gins have been built on the Oklahoma/Kansas border. Cotton has become a very viable crop in producers cropping program, and has become the primary cash crop for many producers.

Funding: Smith-Lever, State

Scope of Impact: Multi-state; KS

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Title: Watermelon World: A Web Based Information Program for Watermelon Growers

Issue:
Growers and agri-businessmen need a current and comprehensive source of information concerning all aspects of watermelon production. Cultivars, pest control recommendations, and cultural management practices are constantly being updated. Printed materials cannot be updated as rapidly as needed. The cost of updating printed matter, especially where colored diagnostic aids are present, becomes prohibitive. One-on-one contacts to disseminate information are also very expensive, and not always feasible in a timely manner. Current, high-quality information is needed to enable growers to produce watermelons efficiently.
What Has Been Done:

Research scientists and extension specialists at Oklahoma State University's Wes Watkins Agricultural Research and Extension Center have worked collaboratively to design and maintain a web page that contains a comprehensive watermelon production manual. The scientists supporting this site represent a diverse group of disciplines including entomology, plant pathology, horticulture, ecology, weed science and agricultural economics. In addition to the production manual, this site also contains a cultivar database that lists cultivar type, days to maturity, fruit weight, fruit shape, rind color, flesh color, sugar content, disease tolerance, and distributors of each cultivar. The data-base is constantly changing to reflect cultivars that are currently available, and presently contains listings and descriptions of 371 cultivars throughout the world. The web page also lists watermelon brokers, as well as a survey form to allow readers to express their preferences and concerns about various facets of watermelon production.

Impact:
Thousands of visits have been made to this web-page. Not only growers in Oklahoma, but watermelon producers throughout the country and world are utilizing the site for information about watermelon recommendations and guidelines. Authors of the site are available by email to answer questions that may develop after visits to the web page. While the identity of each visitor is not verified, emails that solicit follow-up information exchange have been received from throughout the entire watermelon production region of the United States, as well as from Argentina, Venezuela, Spain, Italy, Egypt, England, France, and Puerto Rico. The additional watermelon survey form has been completed by about 200 people, and input from these readers is used as a decision-making tool for follow up research and extension programming. The web-page has enabled growers, brokers, and agri-businessmen to communicate more effectively. This increase in communication and information exchange improves the efficiency of all facets of watermelon production, enhances the efficiency of marketing operations, and should lead to new marketing opportunities for vegetable growers.

Funding: Smith-Lever, State, Hatch

Scope of Impact: Integrated Research and Extension

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Title: Statewide and Local Watermelon Producer Educational Meetings

Issue:
Watermelon is a food crop of traditional importance to Oklahoma with the annually produced 10,000+ acres being valued at over 5 million dollars. New and expanding marketing opportunities exist for watermelon. However, growers must keep current with production technology and consumer/market demands to remain competitive and be able to participate in future industry growth. Watermelon is important to small and large farms alike. The delivery of appropriate educational programs that will benefit all watermelon producers is challenged by the diversity of the needs among them. For example, grower/shippers need information such as marketing trends, labor regulations, and new pest control developments. For smaller scale

producers the needs are more basic and include areas such as identification and control of common pests and variety selection. In summary, the problem at hand is to address these educational needs so that all producers may benefit. Consumers also will benefit by having a reliable supply of this nutritious fruit in the future.

What Has Been Done:
A program comprised of two types of educational meetings has been underway since 1998 through joint effort of County Extension Offices and the Wes Watkins Agricultural Research and Extension Center. A statewide meeting, attended by 25+growers annually, has served to present information from the industry's cutting edge on marketing trends, value-added opportunities, public policy issues and new research findings in various technical areas. Presenters have included representatives of commodity promotion organizations, processing industry representatives and federal and state researchers. To address basic educational needs, of special interest to small farmers, a second type of meeting has been conducted on a more local basis and generally as multi-county efforts. More than 40 growers have participated in these local meetings where information is tailored to specific local needs.

Impact:
The establishment of this meeting series provides a means for Growers, Researchers and Extension personnel to interact with one another. Benefits include:

- Growers more aware of information resources available to them.
- Researchers and Extension personnel are more aware of the specific needs of growers.
- Enhanced grower - grower interaction, a valuable information source in this industry.

Regarding specific technical knowledge, growers are now more knowledgeable of specifics of pest control, soil fertility requirements, and crop culture. Example benefits include:

- Estimated reduction of 2000 acres/yr. (50 acres x 40 farmers) receiving insecticide of low effectiveness or applied at incorrect timing.
- Estimated savings of 40,000 dollars/year (among 30 farmers) in seed costs and other inputs due to crop failure from improper planting time or herbicide application timing.

There are other less tangible benefits growers have received from these meetings as expressed by their comments. Examples of comments (paraphrased):

- The statewide meeting provides a very complete coverage of information of benefit to me.
- The local meeting helps the farmer find answers to questions he has and is greatly appreciated.

Funding: Smith-Lever; State

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. In Oklahoma, only a few of the Oklahoma Cooperative Extension Service educators have formal training in horticulture.

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 educators to develop proactive Extension programs, and 4) form a group of Extension volunteers to support additional consumer horticulture efforts.

Trainees participate in an 8 - 13 week course receiving between 45 - 56 hours of course work on subjects including: basic plant science, vegetables, fruits, nuts, ornamentals, lawns, houseplants, diagnosing pest problems, irrigation, soils, and related topics. Instructors for the training sessions are State, District, and County Extension personnel and specialists. Upon completion of the training period, all Master Gardener trainees are required to satisfactorily pass an exam on materials and topics covered. Only then can the trainees be certified and awarded the title of Oklahoma Master Gardener. In return for these hours of training, certified Master Gardener trainees agree to donate between 45 - 56 hours of volunteer time to the Horticulture program. Many Master Gardeners far surpass the mandatory service hours and continue to participate in the program on a yearly basis.

Examples of Master Volunteer activities include: staffing plant clinics to answer phone and walk-in questions, manning educational exhibits, maintaining demonstration gardens, serving as 4-H horticulture project leaders, speaking at club/civic meetings, assisting with horticulture tours, teaching horticulture activities at nursing homes, etc., judging horticulture exhibits at science fairs, judging 4-H demonstrations/talks, assisting in horticulture mailings, newsletters, etc., and appearing on TV and radio.

Impact(s):
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. Through the innovative program, Extension has reached out to more people and groups. At the same time, the program has significantly affected professional staff's use of time. Survey responses from twelve of the participating counties show a range of 10 - 25% of the educators' time is spent coordinating the program. However, the experiences of the established county programs indicates that the program eventually frees the agents time for other program opportunities. The Oklahoma Master Gardener program has begun to demonstrate clearly that volunteers can serve as excellent educators at the local level in consumer horticulture.

The Oklahoma Master Gardener Program continues to grow across the state and 1998 brought on a record number of volunteer hours. Approximately 290 new Master Gardeners were trained during the 98-99 training season. Close to 835 active Master Gardeners volunteered their time across the state, contributing nearly 39,300 hours of volunteer service (over a 100% increase over last year's hours!) and reaching over 93,800 Oklahomans. This translates to over a half million dollars in service that was donated by volunteers (wage rate of $14.30/hour was used, which includes a 12%

estimate of fringe benefits. This hourly rate is the assigned wage for nonagricultural workers in 1998 as published in the *Economic Report of the President* (1998 edition). This information was supplied by the Independent Sector, an organization that "serves as a national forum to encourage giving, volunteering and not-for-profit initiative."

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Title: Vegetable Gardening for Homeowners and Backyard Fruit Production

Issue:
Many urban and rural homeowners in northeast Oklahoma grow or want to grow fruits and vegetables in their landscapes. Improving the knowledge of the basics of fruit and vegetable production and the pest management involved with these crops benefits the homeowners. The environment also benefits because unneeded and/or over application of fertilizer and pesticides is avoided.

What Has Been Done:
Oklahoma Cooperative Extension Service specialists developed holistic educational materials designed to educate the homeowner about the growing of fruit and vegetables in a backyard situation. Oklahoma Cooperative Extension Service County Agriculture Educators have utilized the Vegetable Gardening for Homeowners and Backyard Fruit Production educational materials to teach urban and rural homeowners the basic concepts of fruit and vegetable production.

Impact:
During the time period of 1998 through 2000 over 1,700 rural and urban homeowners in northeast Oklahoma were provided educational programming on home fruit and vegetable production. Evaluation instruments completed by people attending the educational meeting indicated that these Cooperative Extension programs were evaluated as effective in increasing homeowners' knowledge and ability to properly grow fruit and vegetables in the home landscape.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Oklahoma Gardening

Issue:
With two out of three Oklahoma households participating in gardening in some way, it is important for the public to have the knowledge they need to make wise choices about gardening. OSU's Oklahoma Cooperative Extension Service brings a weekly television show, *Oklahoma Gardening*, to viewers throughout Oklahoma. Surveys have consistently ranked *Oklahoma Gardening* as the most popular Oklahoma-produced show on public television—a fact that indicates just how valuable *Oklahoma Gardening* is in reaching—and teaching––its intended audience.

What Has Been Done:
Oklahoma Gardening airs at 11 a.m. Saturdays and 3:30 p.m. Sundays on OETA, Oklahoma's public television station. The show, which is in its 24th year, is produced by a small staff, with consumer horticulture specialist Brenda Simons as host. Frequent guests on the show are consumer horticulture specialist David Hillock and food specialist Barbara Brown. Steve Owens is manager of the studio gardens, which, as part of the Oklahoma Botanical Garden and Arboretum, have become one of the most-visited sites on the OSU campus—and in the city of Stillwater. The producer-director of Oklahoma Gardening is Ag Communications' Kevin Gragg.

The studio gardens provide a beautiful setting for the show, with gardens throughout Oklahoma providing additional footage. Timely recommendations for gardening activities are a regular part of the show, but innovative ideas for gardening are featured, as well. Food safety, environmental concerns, and economics all play a part in *Oklahoma Gardening* programming, too. Videotapes of *Oklahoma Gardening* segments are among the most-requested educational tapes offered by OSU.

Impact:
The success of *Oklahoma Gardening* can be attributed to the high quality of the show. It has received two national awards from the Garden Writers Association of American and a gold medal from the Council for Advancement and Support of Education. It has been featured on *CBS This Morning* and is consistently the top-rated Oklahoma-produced show on OETA. Summing up the feelings of Oklahomans about the show, the owner of one of the state's largest retail garden centers said, "*Oklahoma Gardening* gives timely, accurate information to the buying public. We have people come in with ideas from *Oklahoma Gardening* . . . That's when we know [*Oklahoma Gardening*] is really making a difference."

Funding sources: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme: Invasive Species

Title: IPM Helps Oklahoma Landowners Fight Invasive Thistles

Issue:
Musk thistle (*Carduus nutans* L) was introduced into the eastern seaboard area of the US sometime 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. 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, as noxious weeds in all counties of the state. Based on "1995 Pasture Survey", average acreage of improve pasture for each producer in Oklahoma 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. Presently only about 10-15% of the state's pastures are significantly infested.

What Has Been Done:
An Oklahoma IPM musk thistle control program was developed in the early nineties and has been implemented statewide through cooperative efforts of researches, extension personnel, and landowners. This integrated program focuses on: 1) increasing public awareness of the problem, 2) development of educational information, 3) demonstrating various control options, and 4) introducing new biological control agents. Numerous demonstration and educational meetings have been conducted. Extension Educators and landowners collected 71,000 musk thistle head weevils in four northeastern counties in the Spring of 2000, and released them on 142 new sites in 20 counties. In all 250,000 musk thistle head weevils were released by this program. In addition, they collected 13,600 rosette weevils and released them on 22 new sites in Oklahoma. Five demonstrations were established in 1999-2000 in eastern Oklahoma. About 120 landowners attended tours of the demonstrations in spring of 2000. They saw results of chemical and biological control; plus signed up for release of weevils on their land. Two fact sheets were published in 2000, one on "Integrated Control of Musk Thistle" and one on "Thistle Identification".

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. However, some landowners just 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. For many of the producers participating, Extension Educators have collected weevils and provided them at no cost. Cost of controlling musk thistles for 10 years using an integrated approach with weevils would be $1,800 or less. This represents an average savings of at least $3,400 per producer over the first 10 years while at the same time significantly

reducing the amount of herbicides broadcast on the land. 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

Contacts

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Key Theme: Managing Change in Agriculture

Title: Time for a Change on the Family Farm

Issue:

Northwest Oklahoma farm and ranch families accumulate wealth through the ownership of land, machinery, equipment, and livestock. When it becomes time to retire, the family must determine what to do with the assets. They can be passed on to the heirs or sold. This decision is often accompanied with problems such as the need for income for retirement, income tax issues, and the desire to treat the heirs fairly.

What Has Been Done:

A multidisciplinary program has been designed to address the issues of transferring the farm, meeting retirement financial needs, evaluating long-term health care needs, reducing income taxes, and planning estate settlements. In late 1998, an advisory committee was put together to evaluate the program priorities and then in 1999 an in-service training session was conducted. All county educators were invited to attend and input was gleaned from the participants as to program content, additional materials needed, and how it should be packaged for presentation in county educational programs.

Impact:

The program was conducted in Kingfisher and Logan Counties in November 2000 and resulted in several farm families reevaluating their financial situation and retirement goals and needs. Participants requested follow-up educational programs to further address issues that were briefly presented during the initial program. Program evaluations indicated the participants/ knowledge, interest in topics, and confidence in using their skills increased on all topics. Program impact will be continuously monitored to improve the program and to meet the needs of the participants.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Key Theme: Ornamental/Green Agriculture

Title: Oklahoma Proven

Issue:
Oklahoma Proven (OKP) is a plant promotion and evaluation program designed to help consumers choose plants appropriate for Oklahoma gardens. Aiding consumers with plant selection will lead to greater gardening success, enthusiasm, and increased sales for Oklahoma green industries. Dale Maronek is the director of OKP, Lou Anella is marketing coordinator, and Mike Schnelle is plant evaluation coordinator. Plants to be promoted by OKP will be selected by an OKP executive committee consisting of OSU faculty and representatives from the wholesale and retail horticulture industries. The executive committee will receive recommendations from an OKP advisory committee composed of industry professionals, cooperative extension specialists and educators, Oklahoma Botanical Garden and Arboretum affiliate members, and Department of Horticulture and Landscape Architecture faculty. Since evaluation and production of new plants takes time, for the first few years the advisory committee will recommend superior plants already available in the trade. As the program grows, cooperators throughout the state of Oklahoma will evaluate plants for aesthetic quality, disease resistance, heat and drought tolerance, and production characteristics. Plants that meet the selection criteria will be distributed to wholesale nurseries for production and -- once they are readily available to retailers -- will be promoted through OKP.

What Has Been Done:
Superior plants have been identified by the OKP Advisory and Executive Committees, and marketing materials have been produced for Oklahoma retail nurseries free of charge. New marketing materials are now available for the 2001 season, our third year helping the Oklahoma retail nursery industry market plants. Posters and billboards (11" x 7" signs) are distributed free of charge to retailers, and pot stakes and hang tags are available to wholesalers for purchase. Point-of-purchase material, however, is not the only marketing assistance provided through OKP. Lou Anella, marketing coordinator, also handles press releases for OKP and has appeared on Tulsa and Oklahoma City television news programs promoting OKP. Oklahoma Proven has also been featured on Oklahoma Gardening, in Oklahoma Today, The Tulsa World, The Daily Oklahoman and Today's Home, a national magazine. Superior plants have been selected for the next few years and announced to industry, allowing them to prepare for the increased demand for plants marketed through OKP by building up their stock.

Impact(s):
We are entering our third marketing season, and interest and recognition of the program is growing. Nursery owners have reported increased sales of OKP plants, and that OKPmarketing materials have made selling plants easier. One nursery owner said he had been recommending oakleaf hydrangea for years but it was not until he could point to the photograph of the flower on the OKP poster that he was able to really sell the plant. Another nursery owner who has a computerized inventory reported an average 81% increase in sales for plants promoted through

OKP. This direct and quantifiable impact has industry excited about the future of the program. Excitement can also be measured by the support, financial and in-kind, that has been provided for OKP. The Oklahoma Department of Agriculture has provided $7500 for the marketing program, and several nurseries have made sizable cash donations to support OKP. Educating the consumer to use plants that will thrive in Oklahoma and therefore require fewer pesticides impacts the health of Oklahoma's environment while it increases the consumer's success rate and enthusiasm for gardening.

Funding Sources: Hatch; Smith-Lever; State

Scope of Impact: State Specific

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Title: Plant Improvement, Development of Propagation Techniques, Germplasm Preservation, Landscape Design, and Introduction of New Plant Materials to Green Industries

Issue:
To increase the profitability of commercial green industry businesses, to help consumers have the best plants for Oklahoma growing conditions, and to introduce new plants to state consumers.

What Has Been Done:
Thirteen OBGA affiliate gardens have been developed around the state. A consortium of OSU, industry, and the affiliate gardens has been developed. An award-winning television program, Oklahoma Gardening, has been developed. Workshops, seminars, and short courses have been developed.

Impacts:
The OBGA and affiliate gardens directly impact the Oklahoma economy through increased tourism. Case in point is the development of Lindonwood Gardens, one of the affiliate gardens, in Grove, Oklahoma. Due to such attractions, the area is the fastest growing community in the state, with a 45 percent increase in tourism over the three years the gardens have existed. Another impact is one of aesthetics. Large areas of Tulsa, Oklahoma City, and other state cities are beautifying their parks, greenbelts, and roadways because of the efforts of OBGA, members of which actually work with communities in such planning. Recreation is also increased, as in the case of the Riverside Drive walkway in Tulsa, where hundreds of people walk and bicycle for exercise. Plant preservation and development also is a major point of impact, with new varieties being developed, propagated, and sold throughout the state through commercial outlets directly benefiting from the research and development involved.

Funding Sources: Smith-Lever; Hatch; State Appropriations

Scope of Impact: Integrated Research and Extension

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Key Theme: Plant Health

Title: Digital Diagnostics @ OSU Plant Disease and Insect Diagnostic Laboratory

Issue:
Agricultural producers, growers, managers, and homeowners need a rapid response system for identification of plant disease and insect pests. Persons requesting identification normally bring a sample to their county extension office for identification. This system relies on the expertise of the extension educator, who if unable to identify the specimen or disease, mails the sample to the Plant Disease and Insect Diagnostic Laboratory (PDIDL). Mail transit time and handling add days to the process and samples do not always arrive in identifiable condition.

What Has Been Done:
Digital imaging technology has advanced greatly in the last few years. Imaging devices are now able to produce pictures that rival some microscopes in detail and clarity. Many extension offices now have the capability to produce digital images of plants exhibiting disease symptoms or insects needing identification. Flatbed scanners and digital cameras have become two indispensable tools for county educators. OSU Entomology and Plant Pathology and OCES established a program in 1999 that allows counties to transmit sample information and digital images over the Internet (http://diagnostics.okstate.edu/). In-service training sessions on use of the system were presented to extension educators statewide in 1999 and again in 2000.

Impact:
Digital Diagnostics @ OSU has made a positive impact on sample identification since system inception.

- At least 12 states now have some form of digital diagnostics
- PDIDL averages ~ 600 samples/yr., ~100 are digital submissions (75-250 national average) split 50:50 between insects and plant disease
- >90% identification rate for insects
- Time from receipt of sample to diagnosis has been cut from several days to as little as ten minutes
- Time saving in diagnosis may translate to more rapid control measures and greater economic return on commodity
- Diagnosis via the Internet is free as opposed to $10 charge for mail-in samples for plant disease identification and control recommendation
- Digital Diagnostics @ OSU website (http://entoplp.okstate.edu/ddd/ddd.html) created to allow extension personnel to find specific information and images of pest species and plant diseases with links to appropriate fact sheets

The system has provided an invaluable resource to extension personnel around the state, aiding them in making more informed decisions and allowing them more efficient use of their time.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Key Theme: Plant Production Efficiency

Title: Grain Sorghum Production in Oklahoma

Issue:
Producers are becoming more interested in grain sorghum as a crop in Oklahoma. With the increasing interest management practices such as planting date and rate are important to be successful.

What Has Been Done:
Grain sorghum performance trials to determine which hybrids are appropriate for different regions of the state. At each trial location planting rate studies are being planted to determine proper seeding rates for each region of the state. Trials have also been established to better fvutilize moisture received in late spring and early summer. By planting trials early with a shorter season hybrid this will allow producers flexibility in planting decision.

Impact
This program has increased interest in grain sorghum production in North Central Oklahoma. The number of acres planted in the eight north central counties increased 21% from 96,000 in 1997 to 116,000 in 1999. The number of Agriculture Educators that are requesting grain sorghum meetings has increased from 2 to 6.

Funding: Smith-Lever, State, Hatch

Scope of Impact: Integrated Research and Extension

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Title: Impact of the Soil, Water and Forage Analytical Laboratory

Issue:

Soil testing has proven to be one of the most important Best Management Practices (BMP) to sustain agricultural production and minimize nutrient loss to water bodies from cropland and pastures. However, many producers routinely fertilize their fields without testing the soil. It is possible to apply unneeded fertilizer or animal manure if the nutrient status of cropland or pasture is unknown. This not only costs producers money, but the additional nutrients may enter water supplies and cause environmental problems. On the other hand, applying inadequate fertilizer could reduce yields and decrease profits. One of the major reasons for farmers not performing soil tests is the lack of understanding of its importance. The sample turn around time sometimes is too long for farmers to make a timely fertilizer decision.

What Has Been Done:
In order to provide better services to the public, we have been striving to improve test accuracy and to reduce sample turnaround time. The lab has been analyzing over 30,000 samples annually in a timely manner for thousands of farmers, ranchers, and homeowners. Test reports are now distributed through the Internet as well as in the traditional hardcopies. Lab users can down load test results from our website as soon as tests are completed. This reduces sample turnaround time by at least 3 to 5 days. It normally takes less than 2 weeks from shipping of the sample to receiving the results. Furthermore, a web-based interactive decision support program allows users to obtain soil test interpretations for all major crops grown in Oklahoma. Fertilizer or animal manure application rates can be calculated to meet nutrient needs online. This program is the first and possibly the only one of its kind on the Internet. It has been widely used by all levels of extension personnel for their educational programs.

Impact:
Each year, we directly serve more than10,000 clientele and more than 1 million acres of land are impacted. Test results are used by producers to formulate their fertilizer program, especially to develop animal waste management plans. Our timely soil testing has facilitated the waste nutrient management plan development for poultry producers and other CAFOs mandated by regulations. The recommendations from the lab have increased nutrient use efficiency; therefore, the yields of crop production for producers who use soil testing should be improved while the cost of fertilizers decrease. The impact of agriculture on the environment as a non-point source should be also greatly reduced by following our recommendations and applying the right amount of nutrients at the right time.

Funding: Smith-Lever, State
Scope of Impact: State Specific

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Title: Evapotranspiration and Irrigation Scheduling in the Webbers Falls Bottom

Issue:
There are approximately 3500 acres of irrigated cropland in the Webbers Falls bottom and a Mesonet weather data site nearby. However, the farmers had not been exposed to the benefits of

using evapotranspiration based on local weather conditions for irrigation scheduling. The major summer crops are soybeans and corn. More accurate irrigation scheduling could prevent plant stress at critical times, prevent applying too much water, and improve farm profitability. A poll of farmers in the bottom found they were unaware of Mesonet and the potential for improved irrigation scheduling.

What Has Been Done:
Rodney King, County Extension Educator, Muskogee County, scheduled an early morning meeting early in the 2000 summer growing season. Bob Woods, Extension Area Agronomist, explained Mesonet and how to access weather information, and Dr. Mike Kizer, Extension Ag Engineer, explained information that could be provided related to irrigation scheduling. On recommendation from the farmers attending, evapotranspiration information was then faxed twice weekly to a local farm supply store for posting on a community bulletin board and continued for the remainder of the summer.

Impact:
According to Robert Ross, storeowner and farmer in the Webbers Falls bottom, he personally used the information but was disappointed that few farmers actually checked the posted information regularly. The service will continue for the summer 2001 cropping season, but the evapotranspiration rates for corn and soybeans e-mailed directly to farmers where possible. One season is too soon to fully determine producer acceptance and use of this program.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Soil Fertility Education In Northeast Oklahoma

Issue:
Most agriculture producers are lacking in knowledge of the behavior of plant nutrients in soils and fertilizer management for optimum crop or forage production even though this topic is fundamental for efficient crop production. As a result, soil testing is underutilized as a management tool. Traditionally, it has been very difficult to interest the farming and ranching communities in attending soil fertility seminars. However, the recent increase in nitrogen fertilizer prices resulting from the surge in natural gas prices has generated an unusual amount of interest in fertilizer practices.

What Has Been Done:
Prior to the sharp increase in nitrogen fertilizer prices, Extension Educators had planned numerous soil fertility seminars for early 2001. Local fertilizer dealers and some other Ag-related businesses helped plan and provided financial support for several of these meetings. Meetings have been held in the following counties since January 2001: Pawnee, Nowata, Ottawa, Mayes, and Muskogee. Additional meetings are set for Tulsa, Okfuskee, Adair and Lincoln

counties. These meetings have been targeted toward the non-poultry producers in northeast Oklahoma. But, current fertilizer prices have increased the interest in purchasing poultry litter as a fertilizer source. Attendance at the 5 meetings held so far has averaged 67 and ranged from 20 to near 100. The Muskogee meeting was targeted to reach crop producers which accounts for the lower turnout. Soil fertility and the proper use of poultry litter continue to be emphasized in continuing education programs for the poultry producers.

Impact:
Soil fertility training for poultry producers and the non-poultry ag producers coupled with the increase in nitrogen fertilizer prices could increase the movement of poultry litter from sensitive areas by increasing the value to non poultry crop and forage producers. Hailin Zhang, Director of the OSU Soil Water and Forage Testing Laboratory, has already reported an increase in soil samples from the counties where these educational programs have been conducted. As a result of these meetings, the address for an interactive website, "soil test interpretation", that assists in determining the value of different fertilizer sources, has been distributed to numerous producers at the meetings and via e-mail.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Oklahoma Statewide Alfalfa email Advisory

Issue:
Alfalfa production occurs throughout Oklahoma and in some years may represent in excess of $70 million to the state's economy. Alfalfa growers, consultants and county educators often try to anticipate arrival of significant pests each year but because early season growing conditions are often unpredictable, it is difficult to accurately predict the impact of the pest that has the greatest effect, the alfalfa weevil. With this need in mind, an advisory system was established in 1996 that utilized FAX and email capabilities to inform growers across the state about early season alfalfa weevil egg populations in January and February. Initially, this system sent nearly 50 FAX transmissions and only a few emails. In 2001, we have grown to service every county educator, nearly 50 consultants and over 100 growers, applicators, chemical representatives and others concerned with alfalfa in Oklahoma. The advisory operates now only as an email system. The challenge is to provide participants with a means of anticipating the arrival of damaging alfalfa weevil and aphid populations and increase timely management of these pests. This system helps growers reduce insecticide inputs and costs of management by creating an atmosphere where commonly one, well-timed application of insecticide can suffice in controlling pest problems.

What Has Been Done:
Data for this advisory is gathered by the alfalfa insect management group consisting of Dr. Phil Mulder, Dr. Richard Berberet, Mr. Kelly Seuhs, Dr. Ali Zarrabi and others. Once in January and again in February or early March alfalfa weevil egg populations are monitored from the major alfalfa growing regions across the state. Typically, 10-14 sites are chosen and 2-3 days are spent in monitoring and sampling fields. An email list has been compiled over the last 4 years and continues to grow at every meeting conducted. The email news release is sent out 1-3 days after data is gathered and every participant gets the timely information directly from the Land-grant University (OSU). County educators are informed at the same time to eliminate concerns over protocol. The news release contains pertinent information about alfalfa weevil egg populations, degree days and egg viability in all locations sampled. In addition, any recommendations are included that might provide participants some idea about the impact of insects in the upcoming season.

Impact:
This program has resulted in reduced applications of insecticides over the past five years. In 1989, the average number of insecticide applications made to alfalfa for weevils and aphids was nearly two. Since this time the number of applications is now much closer to one (1.2 average statewide). Based on the average cost of an insecticide application (about $12.00/A) and assuming a reduction of 0.8 applications per acre per year this represents about $3.8 million in savings to growers. In addition, the positive effect on the environment and the many applicators involved in these treatments.

Funding: Smith-Lever, State, Hatch

Scope of Impact: Integrated Research and Extension

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Key Theme: Rangeland/Pasture Management

Title: Drought Management Strategies for Pastures & Livestock

Issue:
During the summer of 1998, the southern half of Oklahoma experienced one of the worst droughts on record. In addition to the lack of moisture, the temperatures exceeded 100 degrees F for a record breaking 37 days. Many counties also experienced heavy grasshopper and armyworm infestations that literally consumed everything in their path that was green. Along with the forage disappearance, ponds and other water sources for livestock dried up, crops burned up and livestock suffered unmercifully. The challenge was to assist livestock producers in learning the most cost effective strategies for management of forages and livestock, so that they did not have to sell on a down market. Also, grazing schemes, culling strategies, and reports on federal drought relief efforts were developed.

What Has Been Done:
County Extension Educators teamed up with Area and State Livestock specialists and developed a Drought Management Program for Beef and Dairy Producers in Southeastern Oklahoma. The program consisted of a series of 10 meetings spread across southeastern Oklahoma. Along with presentations on alternative feed stuffs and feeding strategies, grazing schemes, etc., literature was provided for the producers to take home that contained information provided during the meetings, as well as decision making tools to aid producers who might consider the drought to be an opportunity to exit agriculture if to their advantage to do so. The meetings and handout materials utilized information developed by the county, area, and state Extension personnel. The sessions were team taught by the local Extension educators and area livestock specialists.

Impact(s):
Over 1500 producers attended the Drought Management Programs. The program was utilized as a model for state Extension specialists who later developed a series of follow-up meetings that emphasized the economic considerations, tax implications, and market opportunities of the drought. Also, later in the spring, a "Post-Drought Management Strategy" program was developed and delivered in Southeastern Oklahoma emphasizing options concerning management alternatives for the coming production year, based upon the impacts of the previous drought on their operations. Although the economic impact of the programs is still being determined, the information presented likely meant the difference between many producers being able to retain their cowherds in order to take advantage of better prices this fall or selling on a down market. In addition, many new audiences were reached and made aware of the opportunities offered by OCES to help them make management decisions.

Funding Sources: Smith-Lever; State Appropriations

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, food preservation, HACCP Training, and microbiological testing. During the year, 249 demonstrations, meetings and conferences were conducted under this goal. These activities were attended by over 9,100 participants during the year. An additional, 1,590 visits and consultations were conducted by OCES personnel with these audiences.

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 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 also conducts training sessions for food related entrepreuners 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 and testing also available in Spanish. 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. In addition, 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.

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 $1.2 million with $160 thousand from Smith Lever funds. About 10 professional and paraprofessional FTEs contributed to the goal last year.

Goal 2 – Key Themes

Key Theme: Food Handling

Title: Master Canners Workshop

Issue:
The Master Canners Workshop provides an introduction and basic training in principles of, good practices in, and regulatory requirements for producing acidified and formulated acid canned foods. This workshop targets both entrepreneurs and existing processors throughout Oklahoma. The course collects and conveys important technical information not previously easily accessible to Oklahoma food processors. This information is invaluable for producing safe, wholesome, and high quality food products that comply with applicable State and Federal regulations.

What Has Been Done:
The first annual one-day workshop was held in August 2000. Topics covered included: basic microbiology of canned foods; basic principles of thermal processing of canned foods; equipment selection, layout, and operation for processing acidified and high-acid foods; proper container handling and closure evaluation; principles of acidification and processing techniques for acidified and high acid foods; record keeping for regulatory compliance and quality assurance; and basic sanitation for a canning operation. Speakers with expertise in each of the target areas gave the presentations and hands-on demonstrations used in the workshop.

Impact:
Twenty-five folks attended our initial workshop. Overall feedback was very positive – the average rating given by the attendees for the helpfulness of the workshop in supporting their business plans was 4.4 out of 5. All of the attendees expressed a desire to continue working with OSU in developing their business. Approximately half have worked with OSU Food and Agricultural Products Center personnel in developing new food products and/or complying with processing regulations for existing products.

Funding: State

Scope of Impact: State Specific

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Title: Tulsa County Food Service Manager Education Program

Issue:
According to the Center for Disease Control, the an estimated 76 million cases of food borne illnesses each year in the United States result in 325,000 hospitalizations and approximately 5,000 deaths. Cost estimates range from $6.5 to $34.9 billion dollars in medical treatment and lost productivity. During the fiscal year 1999 – 2000 in Tulsa County, there were 228 reported cases of disease that are commonly food borne.

What Has Been Done:
In 1993, the local food code adopted the requirement for food service managers to complete 12 hours of food safety education and successfully pass a written exam. The certification is valid for three years at which time managers must re-certify.

Tulsa County has over 1200 food service establishments and more opening every week. The need for options for these managers became apparent and in 1995, Barbara Tricinella, Extension Educator – FCS began teaching a 12 hour course. She also targets the rising number of Hispanic managers by offering the only materials and test available in Spanish.

Impact:
Since the first class was offered, over 1400 managers have been certified or re-certified by OSU Extension. A review of the *Community Health Status Report* for Tulsa County published in July of 2000 indicated that the incidence of three of the most common food borne illnesses had dropped below the expected number of cases between 1996 – 98.

Cases	**Reported**	**Expected**
E. Coli	8	(12)
Salmonella	212	(263)
Shigella	160	(232)

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Key Theme: Food Safety

Title: Reduced-Risk Management of Spinach White Rust

Issue:
Historically, spinach is one of the most important vegetable crops grown in Oklahoma. Spinach is grown on approximately 3,000 to 5,000 acres in Oklahoma each year, most of which are for the food processing industry. Spinach white rust is a chronic disease problem for spinach production. White rust blemishes leaves and affected fields may be discounted or rejected by processors. In addition, yield is lost because fields must be harvested early to escape disease build-up. Since 1990 when EPA revoked registration of the fungicide maneb, spinach yields have declined. Yields reached a low point of 2.2 tons per acre in 1996 due to a severe white-rust epidemic. Since the loss of maneb, growers have not been able to effectively manage the disease in over-wintered and spring crops. In 1996, net revenue of spinach averaged only $15 per acre.

What Has Been Done:
Field trials were conducted each year in Oklahoma from 1996 to 2000 to evaluate fungicides classified as reduced risk by EPA for control of white rust. Reduced-risk classification was necessary because residues typically run high on this leafy crop and spinach is used in products such as baby food. Azoxystrobin, a synthetic derivative of a naturally occurring fungicide, was identified to provide a high level of white rust control under severe disease pressure. Working with the IR-4 program who provided residue data, a major food processor who provided economic data, the OSU Extension Pesticide specialist, and the Oklahoma Department of Agriculture, emergency exemptions were approved for use of azoxystrobin on spinach in Oklahoma in 1999 and 2000. In late 2000, a federal registration was approved.

Impact:
In part because of close cooperation with the food-processing industry, growers rapidly adopted the use of azoxystrobin at a rate of nearly 100%. Yields increased to 6.6 tons per acre in 1999 to 7.7 tons per acre in 2000 with less than 10% substandard grade. In spite of the added cost of production, per acre net revenue from spinach increased from the low point in 1996 to $505 in 1999 and $545 in 2000. Adoption of this technology is valued at over $1 million each year.

Funding: Smith-Lever; 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, 13,340 demonstrations, meetings and conferences were conducted under this goal. An additional, 80,300 visits and consultations were conducted by OCES personnel. All these activities resulted in reaching more than 257,000 participants during the year. Approximately 34% of the participants were non-white audiences compared to 25% in the general population of Oklahoma. The primary non-white audiences were female/Black and female/Native American. Each constituted approximately 10% of those reached.

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 over 80,000 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. A research study conducted during 2000 found that Oklahoma realizes a 44% 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). 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. OCES rural and community development professionals working with county extension educators, community leaders, community groups, and other agencies have community health planning sessions around the state. 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 $4.4 million with $1.6 million from Smith Lever funds. About 84 professional and paraprofessional FTEs contributed to the goal last year.

Goal 3 - Key Theme: Human Health

Title: Rural Health Care

Issue
Medical facilities and services are vital to the survivability of rural communities. It is a critical component to economic development efforts to attract jobs and income to rural areas. Medical facilities have a tremendous medical and economic impact on the community in which they are located. These facilities not only employ a number of people and have a large payroll, but they also draw into the community a large number of people from rural areas that need medical services. This is true for Shattuck and Ellis County in Western Oklahoma. The population of Ellis County has declined from 5,596 in 1980 to 4,194 in 1999 a 25% decrease. This decline has put a financial stress on local services such as the health care. The health care sector not only provides health services to the county and into the Texas Panhandle, but it also provides 272 direct and indirect jobs and $5,703,753 in payroll. This generates approximately $1,000,000 in retail sales to the main street businesses in the county.

What Has Been Done:
Newman Memorial Hospital medical service area has completed a community health planning process that was provided by OSU Cooperative Extension Service and the Oklahoma Office of Rural Health. A series of 6 meetings were conducted over a seven month period with a regular attendance of 12-15 members of the community including the hospital administrator, director of nursing, local dentist, state representative, VA representative, several mayors, and county commissioners. Several studies were conducted and presented to the local planning committee: A Physician Feasibility Study, Ellis County Data and Information, Economic Impact Study of the Health Sector in Ellis County, Ellis County Health Services Directory, and a Ellis County Phone Survey and Results Report.

Impact:
As a result of the planning process the hospital has decided not to apply for Critical Access Hospital status, which would have changed some of their reimbursement levels for Medicare. The economic impact study was utilized by the hospital board for a successful county sales tax campaign to provide additional funding for the hospital. This will provide over $247,000 per year for the next 5-years to help maintain jobs and services for the citizens of Ellis County. As a result of the survey results and a review of the data and information, Newman Memorial Hospital is developing a marketing/public relations program geared towards attracting primary care patients from the medical service area. The hospital has a reputation as a specialty care hospital with its extensive orthopedic program, but the phone survey and the data and information report both showed the need to develop the primary care clientele as a future direction of the hospital. The physician feasibility study showed that the hospital has a sufficient number of primary care physicians to handle the patients demand.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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CSREES Goal 4: Greater harmony between agriculture and the environment

Overview

Oklahoma key program components contributing to this goal include: water quality, animal waste management, pesticide applicator training, pesticide impact assessment, natural resource stewardship, and environmental and natural resources 4-H youth programs. 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 some have been included under this goal because of the theme designations established by CSREES. During the year, 850 demonstrations, meetings, and conferences (not including 4-H youth) were conducted under this goal. These activities were attended by 44,000 participants during the year (an additional 58,000 participants attended the youth activities). An additional, 1,400 visits and consultations were conducted by OCES personnel with non-youth audiences.

Integrated pest management and related pest management teams exist for wheat, alfalfa, soybeans and peanuts, greenhouse and horticulture products, pecans, cotton, 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. Another highlight set of key programs under this goal is those in natural resource stewardship. These programs are also related to the natural resource management programs under goal 1.

The IPM musk thistle control program has conducted a highly successful campaign to use biological control agents in controlling this invasive, noxious weed. Weevil demonstrations, roundups and educational meetings resulted in excellent control in parts of the state. The use of the biological control agents will likely result in a 60% decrease in herbicide use in state mandated control. This should result in about a $3,400 cost savings per producer over a ten-year period representing $25 million in the presently infected areas. Prescribe fire education, training, and demonstrations has increased the numbers of acres burned (prescribed) in forest habitat by 100% over a 12 year period to approximately 800,000 acres. This has resulted in improved habitat for two endangered species and several economically important species. The program has had a similar impact on prairie and shrubland with over one million acres presently prescribed burned improving water quality, habitat for several declining species and economically important species and beef cattle. The Caddo County Peanut Disease FAX/Advisory helps producers and agribusiness in the county reduce fungicide applications for peanut leafspot diseases. During the year, 155 producers saved an average of four fungicide applications. This resulted in a $350,000 savings in fungicide and application costs, as well as, the positive impacts on the environment from not making unnecessary chemical applications. Pesticide Applicator Education efforts resulted in over 2,000 applicators taught proper pesticide delivery methods. Education also helped reduce the amount of phosphide fumigants used while improving the safety of their use. PAE sponsored programs also collected 40,000 pounds of pesticide containers during the year. Education for Oklahoma Department of Transportation Pesticide Applicators resulted in a 30% reduction in the use of atrazine in three years. Poultry Waste Management Education provided a nine-hour curriculum resulting in 1,232 poultry producers receiving a certification in waste management. This certification was mandatory for producers to continue in business. The program also provides numerous yearly activities for producers to get three hours of continuing education. The number of poultry producers keeping litter application records has increased by 34% and those using litter storage facilities tripled

since the education programs began two years ago. Grasshopper management workshops and demonstrations helped participating ranchers save $240,000 in insecticide costs and saving 2,300 tons of forage worth $140,000 for an average of $8.75 per acre financial gain.

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 $3.5 million with $0.7 million from Smith Lever funds. About 42 professional and paraprofessional FTEs contributed to the goal last year.

Goal 4 – Key Themes

Key Theme – Agricultural Waste Management

Title: Poultry Waste Management Education

Issue:
The Oklahoma Cooperative Extension Service and Oklahoma State University were asked in February 1998 to develop and deliver Poultry Waste Management Education in response to the Oklahoma Registered Poultry Feeding Operations Act. The new law came about in an effort to manage phosphorus and other nutrients affecting the waters of the state. This education is an effort to reduce the potential of water pollution arising from the poultry industry in eastern Oklahoma.

What Has Been Done:
We provide nine hours of initial waste management training and three hours of annual update training thereafter for Oklahoma poultry producers and poultry litter applicators. 1232 people received certificates for completing the first nine hours. We have offered 54 hours of continuing education to date. Several continuing education events have been planned in cooperation with agencies such as OCC, Delaware County Conservation District, NRCS, and ODA. We developed record keeping notebooks to help farm operators manage their farm records. Notebooks were requested and received by 481 people.

We won a blue ribbon in the ASAE Educational Aids Competition for a CD-ROM of our training materials. The competition included the USA and Canada. The CD-ROM was developed to help our Extension Educators study the materials so they would be prepared to present them to farm operators. We are now producing a video series of the initial nine hours of training. These videos will make training more accessible to future poultry farm operators and litter applicators. They will also make it easier to share our program with other states.

Impact:
The final report on the Small Farms Livestock Pollution Prevention project included data on poultry farms in Adair, Cherokee, and Delaware counties. It showed the number of producers keeping litter application records increased from 34% in 1997 to 88% in 2000. The number of poultry producers considering using litter storage facilities increased from 13% to 43% during the same time.

Survey responses, pre and post-test results, and discussions we have had with participants, show they are learning new ways to manage their poultry litter, and appreciate knowing why it is necessary. Poultry producers have families and drink the local water just like their neighbors. They want to reduce the potential for pollution. The purpose of the training is to teach them how to protect the waters of the state, and we are accomplishing our goal.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Animal Waste Management Information Team

Issue:
Animal waste management issues are complex – generally requiring the expertise of many disciplines. Animal waste management is also the center of a great deal of controversy. The OSU animal waste management team was created in 1999 to facilitate the free exchange of ideas on waste management between citizens, educators, and government entities.

What Has Been Done:
An animal waste management information coordinating committee consisting of eight faculty members representing extension, research, and teaching components from the departments of Agricultural Economics, Animal Science, Biosystems and Agricultural Engineering, and Plant and Soil Science was formed. The committee meets quarterly to coordinate the efforts of the larger Animal Waste Management Information Team.

An email group was created to disseminate information to all OSU faculty, students, administration, and staff with interest in animal waste management. The list currently includes 97 names from 4 colleges. A monthly lunchtime meeting was established to share information and research data on animal waste management. Approximately 30 people regularly attend the "ordure luncheon" at noon on the third Monday of each month.

A website was developed and is currently being put on-line. The website will allow citizens easy access to university extension and research information on waste management. A synopsis of manure research and extension projects was compiled and is undergoing updating. Project descriptions will allow university administration and faculty to communicate progress OSU is making in animal waste management.

Impact:
The animal waste management team has created a forum in which on-campus faculty can discuss animal waste issues. The team will soon be enlarged to include off-campus university staff with the intention of becoming the unbiased source of factual information on animal waste management for the state of Oklahoma.

Funding: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Endangered Species

Title: Ecosystem Restoration of Prairies, Shrublands, and Forests

Issue:
Oklahoma land managers get prescribed fire information to restore their land to productive and biologically diverse states through this OSU educational program.

What Has Been Done:
Six demonstration and research sites are located in forested areas in five Oklahoma counties. Three of the sites have been producing research data and providing sites for field days for more than 13 years. Three demonstration and research sites are located in shrubland (sand shinnery oak and sand sagebrush) sites in two Oklahoma counties. These sites have been producing research data and providing field day sites for the past three years. Numerous demonstration sites are located throughout the state on prairies. This restoration program is based on using an ecosystem approach of prescribed fire based on historical landscape models. This includes restoration of habitats for both common and endangered wildlife species and domestic grazing animals. In the past five years, more than 200 field days and slide presentations have been presented based on this program attended by more than 10,000 participants.

Impact:
During this time, the number of acres burned in Oklahoma's forested habitat has increased by more than 100 percent to approximately 800,000 acres. This increase has resulted in improvement of habitat for two endangered species, red-cockaded woodpeckers and black-capped vireos, and economically important wildlife such as the wild turkey and white-tailed deer. Well over one million acres of prairie and shrublands have been burned this period. This has resulted in removing invasive plants such as eastern redcedar and improving habitat for lesser prairie chicken (a declining species), mule deer, white-tailed deer, bobwhite quail, and beef cattle. Based on other research, the watersheds and subsequent water quality and water yield have been improved in the burned areas. In addition to these activities on private lands, three National Wildlife Refuges and six Oklahoma Department of Wildlife Conservation management areas have implemented prescriptions as a result of this program.

Funding Sources: Smith-Lever; State, Research; Renewable Resources Extension Act (RREA), USDA Forest Service, USDA Natural Resources Conservation Service.

Scope of Impact: State Specific

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Key Theme – Forest Resource Management

Title: Oklahoma Master Woodland Owner Program

Issue:
This program is a "Train the Trainers" education thrust designed to produce knowledgeable volunteers to assist in promoting sustainable forest management. This program is based on a "Diffusion of Innovation" model in which adoption of new technologies and ideas is facilitated in communities through initial adoption by community leaders. Nearly 70 percent of Oklahoma's forested land is owned by private, non-industrial landowners. However, comparatively few of these owners have plans to manage these forests in a sustainable fashion, increasing the potential for environmental damage as well as economic loss. The challenge is to get private, non-industrial landowners to embrace the concepts and practices of sustainable forest stewardship, including but not limited to wood products, wildlife, watershed protection, recreation, and carbon sequestration.

What Has Been Done:
The first class of Master Woodland Owners in Oklahoma graduated June 29, 2000. They received ten training sessions in forestland stewardship: pine and hardwood management, best management practices (BMPs), conflict resolution, prescribed fire use, wildlife management, taxes and estate planning, and timber use. The program will be continued with the current class in numerous, follow-up volunteer activities. The initial program process also will be repeated with a new class in 2000 - 2001.

Impact(s):
Volunteer activities to date include participation by graduates in Oklahoma's Youth Forestry and Wildlife Camp, Caring for Planet Earth, and a recent workshop for landowners that took place at Robber's Cave State Park.

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Title: Integrated Wildlife, Timber and Livestock Management

Issue:
Forested habitats represent approximately 24%, or 4.2 million ha, of Oklahoma's land cover types. One of the largest is the shortleaf pine-oak type which also composes the largest forest cover type in the eastern U.S. In Oklahoma, land use in this cover type includes forest products, livestock and recreation. Increasingly, non-industrial private landowners consider wildlife related objectives very important, many times they are equal to or more important than other land management objectives. With the increase in hunting leases on private lands, the birth of an eco-tourism industry, and increased emphasis on wildlife as a private land management objective, wildlife resources have gained new status in the market place. Wildlife species and their associated communities have intrinsic value to society that may well exceed mere economic valuation. The challenge is to provide a variety of integrated land management techniques that will enable landowners to best meet their individual set of land management objectives.

What Has Been Done:
A demonstration-research area developed to illustrate a variety of sustainable land management options has been in place since 1983 in southeastern Oklahoma in Pushmataha County. Data has been collected on an array of 10 different strategies for land management in the mixed pine-hardwood type using only timber harvest and fire. These strategies encompass land management options ranging from a wildlife emphasis, a timber emphasis and a livestock emphasis plus several treatments that demonstrate an integrated approach. A color field guide showing history of treatment development and with supporting data summaries has been developed for those participating in tours of the area.

Impact:
In 2000, some 145 land managers or owners have toured the area as part of 8 field days, Workshops or field trips. Groups have included BIA land managers, Master Woodland Owners, Pushmataha Co. Cattlemen's Association, USFS Silviculturalists and Biologists, ODA Foresters, ODWC Biologists and 3 college classes. Participants indicated that they collectively manage or own some 1.8 million acres in Oklahoma and other states. Estimates indicate that practices have been implemented on at least 10,000 acres. Early in the year Outdoor Oklahoma featured the area on a television program that was broadcast 12 times to an estimated viewership of over 100,000.

Funding: Smith-Lever, State, Hatch

Scope of Impact: Integrated Research and Extension

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Key Theme – Hazardous Materials

Title: Canadian County Extension "America Recycles Day"

Issue:
Providing citizens opportunities to properly dispose of recyclable materials such as used oils, batteries and tires is important to keep such materials out of landfills and roadside ditches. Canadian County Extension held a recycling day in conjunction with "America Recycles Day" on Nov. 15, 2000. The challenge is to provide citizens with environmentally friendly options for disposal of recyclable materials.

What Has Been Done:
The citizens of Canadian County responded to this opportunity to "do the right thing" by delivering 938 car tires, 131 large truck tires, 60 car batteries, and 830 gallons of used oil for recycling. Our extension community development staff will take the tires to 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 will be sold to a smelter to defray the expense of the roll-off boxes used to collect the tires. Used oil we recycled went to Canadian County District #1, where it will be burned to provide heat for the shop this winter. This benefits county taxpayers by saving the money that would normally go to buy gas to heat the shop. Estimated savings to the county general fund is about $40 per day when the county uses recycled oil instead of natural gas to heat the shop.

Impact(s):
- Recycled 938 car tires, 131 truck tires, 830 gallons of oil, and 60 batteries.
- Over 1,100 tires removed from possibly ending up in roadside ditches.
- 830 gallons of used oils put to good use and kept out of groundwater resources.
- The lead from 60 car batteries recycled and kept out of the environment.

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Integrated Pest Management

Title: Sorghum Ergot Epidemiology

Issue:
Oklahoma State University cooperated with plant pathologists from Texas A&M University, Kansas State University, and the University of Nebraska in a sorghum ergot monitoring project. Sorghum ergot infects primarily male sterile forage sorghum. It was first reported in the United States in 1997 when it was detected in south Texas. Early estimates indicated it would take 10 to 15 years to move to the northern portions of the Great Plains sorghum producing area. In the fall of 1997 sorghum ergot was found infecting forage sorghum in Georgia, Kansas and Nebraska. The challenge has been to monitor the development of the sorghum ergot epidemic of 1999 and to correlate its development (including the incidence and severity of ergot) with environmental parameters (e.g. temperature, relative humidity, radiation, wind speed and direction, etc.) from Texas to Nebraska.

What Has Been Done:
Oklahoma State University participation in this project includes the planting of sorghum ergot trap plots at the Panhandle Research Station, Goodwell and the Eastern Research Station, Haskell. The plots were monitored for ergot beginning with flowering of the sorghum plants and continuing until a killing frost. Weather data for the two planting sites was recorded and downloaded using the Mesonet weather stations located on the Panhandle Research and Eastern Research stations.

Impact(s):
No sorghum ergot was found at either location. The extremely dry weather that occurred in Texas and Oklahoma during the summer and fall of 1999 most likely prevented the occurrence of ergot in Oklahoma's trap plots. In the year 2000, Oklahoma established a trap plot but unusually early fall frost prevented the monitoring procedure. The observations made during 1999 provided more information and increased knowledge about the type of environmental conditions that favor or slow the occurrence of sorghum ergot. Establishment of trap plots will continue in Oklahoma, particularly as conditions raise the degree of threat this disease poses to forage sorghum.

Funding Sources: Smith-Lever; State

Scope of Impact: Multi-state Integrated – TX, KS, NE

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Title: Caddo County Peanut Leafspot Disease FAX/Advisory

Issue:
The Caddo County Peanut Disease FAX/Advisory is a program developed to help Caddo area peanut growers keep track of peanut leafspot disease conditions. By tracking leafspot disease conditions, peanut producers can determine when fungicide applications are most effective and, more importantly, when foliar fungicides are not needed. The FAX/Advisory follows a disease development model developed by John Damicone, OSU Extension Plant Pathologist, to determine potential for peanut leafspot infection. Weather data needed for the model includes humidity, temperature, and rainfall. This information is collected from Mesonet, Oklahoma's statewide automated weather information system. The challenge is to save peanut producers money, either by reducing peanut disease infection in their fields or by reducing fungicide costs; and minimize chemical controls.

What Has Been Done:
Data are applied to Damicone's peanut leafspot disease model, and the results are plotted to a calendar. Based on that information, a FAX/Advisory is faxed twice each week from the Caddo County OSU Extension Office to eleven area agribusinesses that peanut farmers routinely visit. When conditions are extremely dry or extremely wet, additional information and recommendations are included on the FAX/Advisory to alert growers of current conditions.

Impact(s):
Our latest evaluation data (10/2000) show that during the summer of 2000, approximately 155 peanut producers were given information on leafspot disease development from the Peanut Leafspot FAX/Advisory. Most growers saved an average of 4 fungicide applications this year. Over $350,000 in fungicide and application costs to peanut producers was saved, plus the positive effects on the environment from not using unnecessary chemical applications.

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Title: Integrated Pest Management of Aphid Pests in Wheat

Issue:
Integrated pest management and challenged to develop profitable aphid management strategies for aphids in winter wheat.

What Has Been Done:
Developed research projects addressing aphid ecology and management in Oklahoma.

Impact(s):
Significant findings and potential impacts for managing aphids in winter wheat. A three-year economic injury level study on aphids in winter wheat has been initiated. More accurate economic thresholds for aphids will result in increased profitability for Oklahoma wheat producers. After two years of research, we are developing a more efficient sampling plan for aphids in wheat that eliminates the need for counting. Producers or consultants will only need to identify weather aphids are present or absent from sampling as little as 35 tillers or up to 100 tillers in a field. We have demonstrated that reduced dosages of Imidacloprid (seed treatments) prevent aphid population increases while increasing yields and net profits for mid-to-late planted wheat. Also, these reduced dosages appear to be compatible with highly effective natural enemies. Additionally, relative to natural enemies of aphids in wheat, experimental evidence from field studies indicate that parasites and ladybeetles are able to prevent aphid populations from increasing. Identifying levels of each of these natural enemies during aphid sampling will allow producers to make correct decisions on whether insecticides are needed. Accurate thresholds for parasites and ladybeetles are currently being evaluated. Several of these studies on aphids in winter wheat have indicated a significant potential for cost savings for managing aphids.

Funding: Smith Lever; State Appropriations; Hatch Act

Scope of Impact: Integrated Research and Extension

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Title: Grants Program Has Significant Impact on IPM in Oklahoma

Issue:
The greatest constraint in the implementation of Integrated Pest Management (IPM) is lack of knowledge regarding its benefits and possibilities.

What Has Been Done:
In 1998, 2000, and 2001, the IPM Program at Oklahoma State University offered internal competitive grants for projects that promote the principles of IPM in Oklahoma, with an emphasis on education to the end-user. Besides the money offered by the IPM Program, additional funding support came from OCES and OAES. Proposed projects are required to support the objectives of the OSU IPM Program, yet the criteria for funding is otherwise broad: to foster IPM in agriculture, schools, urban landscapes, or any aspect of food processing. Extension personnel, including campus and area specialists along with County educators, submit a dozen proposals each year, with most of those receiving funding. Total amount of awards ranged from $40,000 to $70,000 per year (average award: $6,500). This fall, a survey was conducted of past grant recipients to determine the impact and value of the IPM Grants program.

Impact:
A list and description of the projects that were funded with IPM Program money is available on the Web at http://ipm.okstate.edu/ipm/minigrants.html. The recipients of seven projects, funded in 1998 or 2000, responded to our survey. Without exception, every recipient of past IPM Program grants considered this program to be quite valuable, and repeatedly indicated that their IPM project would not have been possible without this funding. In general, they used the money to prepare and deliver educational material, set out demonstration field plots, conduct grower meetings, and initiate Web sites. Several commented that the IPM projects required the involvement of field staff with area and campus specialists, and "develop new partnerships with non-OSU organizations and industry leaders." Others said the IPM Grant money allowed the opportunity to test new outreach ideas, "to start in new directions." Repeatedly, these project leaders believed the "grants program is key to continuing the implementation phase of IPM." The survey requested some form of impact measurement; while some could not put a number to the end-users who adopted IPM techniques as a direct result of their project, others could be specific. For example, the educational program developed for biological control of musk thistle directly impacted 500 landowners, with an estimated additional 1,000 landowners who changed their land management practices as a result of this project. A project on extending alfalfa stand elife with integrated management practices was demonstrated in four counties, and approximately 600 growers were exposed to the information from these demonstration plots, either through tours and field days or through newsletters. As many as 300 alfalfa producers have adopted some portion of the lessons learned from that project. Funding from the IPM Grants Program allowed the development of two innovative Web sites that addressed pest problems in a new way. The Plant Doctor and Turf Doctor Web sites evolved into the current Digital Diagnostics Web site at http://entoplp.okstate.edu/ddd/ddd.html, which is used by not just Extension educators but also by homeowners around the country. In conclusion, it was an area specialist who provided the clearest testimonial to the value of the IPM Grants Program when he said, "The IPM Grants Program is important to me because it allows field staff to clearly demonstrate that IPM practices are adaptable. Participants including Extension educators…are able to experience first-hand the results of an integrated approach to problem solving and I believe this equates to greater adoption of recommended practices."

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Providing Vital Entomological and Production Updates to Enhance Cotton Insect Control Decisions in Oklahoma

Issue:
A statewide network highlighting Extension Entomology activities has evolved to provide timely 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 fine-tune management strategies unique to each production region of the State – Southwest, West Central, and Northern. 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. Bollgard 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.

Impact:
This educational network continues to provide key entomological information strengthening the foundation for cotton IPM across the state. Cotton Sentry subscription list has steadily increased since its conception in 1990. In 2000, 77% of the subscribers (165) received the Cotton Sentry electronically compared to 23% of the subscribers (47) preferring the mail edition. Reducing insecticide usage is extremely difficult with an active boll weevil eradication program underway. However, with the introduction Bollgard™ technology in 1996 insecticide applications have dropped accordingly. Conventional cotton managed the same as Bollgard™ cotton received 3.7 more insecticide applications per season (1996 – 1999). Field research indicates the value of investing in Bollgard™ technology since 1996 was $39.59/acre (weighted average) or $6,317,772 dollars (Bollgard™ acreage = 159,580 acres for 5 years).

Funding: Smith-Lever, State

Scope of Impact: Multi-state; KS, TX

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Title: Grasshopper Management in Rangeland and Pasture

Issue:
In 1998, grasshopper populations exceeded economically damaging levels in several counties in Oklahoma that bordered the Red River, causing severe forage loss in rangeland/pasture. Control options were limited because corrective control with insecticides is ineffective on adult grasshoppers, and the Federal cost-share grasshopper control program that was traditionally available through the Animal and Plant Health Inspection Service (APHIS) had been eliminated due to a lack of funding. Therefore, growers were faced with expensive and potentially ineffective options for grasshopper control. Recently a new grasshopper control technology called Reduced Agent/Area Treatment (RAAT) was developed for control of grasshoppers. RAAT applications allow growers to apply an insecticide on ½ of the total acreage with little reduction in effectiveness, making them both cost effective, and environmentally friendly. Our challenge was evaluate the effectiveness of RAAT applications in Oklahoma, to educate ranchers on the timely application of grasshopper control using RAAT applications, and to identify new insecticides that could provide cost-effective, environmentally sound control of grasshoppers for individual ranchers.

What Has Been Done:
Three multi-county "Hopper Stop" meetings, with a combined attendance of 40 ranchers representing 83,000 acres of range and pasture, were conducted in Bryan, Jefferson, and Beckham counties in 1999. Producers were introduced to basic information on grasshopper biology and control, including the concept of RAAT applications. In 2000, several articles about grasshopper management were published in the Oklahoma Crop STATEment as grasshopper egg hatch began. Two research/demonstration programs were established in Love and Jefferson counties to evaluate and demonstrate the utility of using RAATs for control of grasshoppers. An emergency exemption for the use of diflubenzuron to control grasshoppers using RAAT applications was also obtained in May 2000 from the Oklahoma Department of Agriculture.

Impact:
The replicated demonstrations showed that RAAT applications of diflubenzuron were effective at reducing grasshopper numbers below economic thresholds. An estimated 40,000 acres of land were treated with diflubenzuron using RAAT technology in 2000. Through the use of RAAT technology and the availability of diflubenzuron, ranchers were able to reduce their potential out of pocket expenses for grasshopper control from ca. $9.50 per acre to $3.50 per acre, yielding a

savings of $240,000.00 in application costs over conventional control methods. Yield benefits obtained from controlling grasshoppers saved an additional 2,300 tons of forage for cattle consumption, which was worth $140,000.00. In total, an additional $380,000.00, or $8.75 per acre in potential income made available through the use of RAAT applications of diflubenzuron for control of grasshoppers compared to conventional control options. Additionally environmental benefits were gained through the use of RAAT applications compared to conventional grasshopper control methods.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Key Theme – Natural Resources Management

Title: Environmental Quality Incentive Program (EQIP)

Issue:
The Environmental Quality Incentives Program (EQIP) was established in the 1996 Farm Bill to provide a voluntary conservation program for farmers and ranchers who face serious threats to soil, water, and related natural resources. Nationally, it provides technical, financial, and educational assistance primarily in designated priority areas. Half of the program is targeted to livestock-related natural resource concerns, the remainder to other significant conservation priorities. Beginning in 1997, and continuing through today, memorandums of agreement have been signed between the USDA/NRCS and the Oklahoma Cooperative Extension Service (OCES) whereby the OCES has been charged to implement and oversee all EQIP education endeavors throughout Oklahoma.

What Has Been Done:
The OCES has distributed EQIP funds to various groups who have held seminars, workshops, produced publications, manuals and other programs throughout the state. In 1999, there were over 30 programs offered, including; a four-part course in Ranch Dollars and Sense, a BMP Symposium for chicken litter to protect water quality, several cattlemen tours of the Noble Foundation, several no-till seminars, a bus tour of eastern Oklahoma concentrating on the establishment and maintenance of riparian areas, animal and human waste issues, and prescribed grazing systems. There was a symposium on the control of sericea lespedeza, two cedar rodeos where fire and other methods of Redcedar control were demonstrated, and five workshops on musk thistle control. Noble County hosted a forage seminar, while Geary and Taloga hosted eight range management workshops. Woodward County put on a range-monitoring program. There was a program on cool season grasses presented in Alfalfa County. A soil quality

conference was held at Redlands Community College in El Reno, Oklahoma. The OCES through EQIP funds, published two 400-page range management manuals for western and eastern Oklahoma, produced an excellent no-till video and fact sheets, and produced a prescribed fire video. A complete Dollars and Sense less plan, along with a CD, was published. More than 1500 Oklahoma EQIP contract holders, farmers, and ranchers were served in 2000.

Impact:
The EQIP Educational Program, administered by OCES, has been very instrumental in bringing high quality Environmental Education to Oklahoma farmers, ranchers, and the general public. Several programs are underway for 2001. Two 2001 programs are being developed to aid and educate underserved farmers and ranchers throughout Oklahoma.

Funding: State

Scope of Impact: State specific

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Key Theme – Pesticide Application

Title: Pesticide Applicator Education

Issues:
EPA's work on the 1988 amendment to FIFRA and the Food Quality Protection Act (FQPA) have impacted all pesticide applicators. These impacts have been from total product removal from the market place to selective deletion of uses on pesticide labels and addition of risk management measures. The latter may be the more important item as it is often difficult for applicators to keep up with these small changes.

What Has Been Done:
Oklahoma State University's Pesticide Applicator Education (PAE) program has provided information to applicators on label changes through various avenues. These include the monthly *Pesticide Reports* newsletter, direct mailing to applicator groups, program presentations and programs directed to specific applicator groups. These activities have reached over 300 applicators and decision-makers through *Pesticide Reports.*

Fumigation and Food Processing workshops were held to keep applicators informed of new regulations and pest management developments. The Fumigation Workshops were held across the state. Oklahoma Department of Agriculture Inspectors were also included in one special session. The Food Processing Workshop involved speakers from Canada, Texas and

Washington in an effort to provide the most up-to-date information on insect pest management in food warehouses.

Impact:
Information transferal on pesticide removal from the market, use deletion and risk management decisions has allowed Oklahoma pesticide applicators to remain current and alert on proper pesticide use. Over 2,000 applicators have been reached through our various delivery methods. These applicators range from Master Gardener, to commercial applicators, to farmers/ranchers and to non-commercial applicators.

Information provided on phosphide fumigants has allowed applicators to reduce the amount used and increase the safety of fumigations. Our programs have impacted over 300 applicators in Oklahoma. Over 200 Pest Control Operators (PCOs) have been reached through our efforts.

Sixty percent of the grain industry attended the in-state fumigation programs. Over 60 businesses attended Food Processing workshop. Information from both provided applicators with up-to-date information on pest management and information on new technology for pest management and safe pesticide use.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Pesticide Applicator Education and Termite Pre-Treatment

Issues:
Termite pre-treatment had been a major enforcement problem of the Oklahoma Department of Agriculture (ODA). ODA identified the major problem and formed an advisory committee of which Pesticide Applicator Education (PAE) was a member. The problem was Pesticide Control Operators (PCOs) were not applying correct amounts of termiticide to the pre-construction sites. Often, no termiticide was applied at all. After much discussion, it was determined that ODA needed to enforce the existing laws and regulations.

What Has Been Done:
To address the pre-treatment problem PAE worked with the Oklahoma Pest Control Association and ODA to design information programs for PCOs and builders. Several programs were held in Oklahoma City and Tulsa. The programs were designed to inform the PCOs and builders on what existing laws and regulations required for termite pre-treatment. Six programs were held

over two years focusing on this issue. Speakers from out-of-state and from other organizations were employed to address specific issues.

Impact:
These programs resulted in decreased enforcement actions by ODA. This also resulted in increased compliance and proper application of termiticides to pre-construction buildings in the state. The reduced number of complainants received by ODA has allowed ODA to focus on other pesticide areas. The programming impacted over 300 pesticide businesses. The result also improved working relations between the PCOs, builders and ODA. Part of the result was improved termite pre-treatments being made.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Pesticide Applicator Education: EPA Regulatory Issues

Issues:
EPA's Reregistration activities on aluminum and magnesium phosphide, chlorpyrifos-methyl and pirimiphos-ethyl on stored grain have potentially major impacts on the stored product industry.

What Has Been Done:
Oklahoma State University's Pesticide Applicator Education (PAE) and Integrated Pest Management programs have worked with EPA and USDA's Office of Pest Management & Policy on these regulatory issues. PAE provided funding for OSU research and extension personnel to travel to Washington, DC and meet with EPA on these issues. PAE has kept up with the various changes and activities on each of these pesticides and has provided that information to OSU research and extension personnel as well as to industry leaders.

PAE has made presentations to stored product managers in Arkansas, Louisiana, Minnesota, Mississippi, Missouri and Texas. PAE has also worked with State Lead Agency personnel on the phosphide issue.

Impact:
Information transferal on safety issues involving phosphide fumigants has increased the awareness of applicators to EPA's concerns. This has also allowed us to provide information on upcoming regulations and how to comply. Through these programs increased interest in Closed-

Loop-Fumigation and developing a fumigation monitoring plan have been brought to the forefront.

Information provided on phosphide fumigants has allowed applicators to reduce the amount used and increase the safety of fumigations. Our programs have impacted over 300 applicators in Oklahoma. Over 200 stored product managers out-of-state have been reached.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Oklahoma Pesticide Impact Assessment Program

Issues:
With the enactment of the Food Quality Protection Act and the continuing reregistration process, there is a continued need for documenting pesticide use, exposure, pest management, and the changing production systems within the state.

What Has Been Done:
Oklahoma State University's National Agricultural Pesticide Impact Assessment Program (NAPIAP) has developed sound databases for wheat, stored grain, cotton, alfalfa, sod production, and peanuts. The program has developed working relationships with various OSU programs (Integrated Pest Management, IPM; Pesticide Applicator Education, PAE; IR-4, etc.), grower, applicator, and processor groups, and state agencies including Oklahoma Agricultural Statistics Service (OASS) and Oklahoma Department of Agriculture (ODA). These databases document pesticides applied, frequency, major pests, method of application and applicator (private or commercial), and other pertinent management information. From these databases, estimates can be made on impact of changes in pesticide management and potential human exposure to various pest management strategies. Combined with the contacts with grower, applicator and processor groups, the information can be transferred quickly in both directions.

Impact:
To respond to USDA-OPMP regarding reregistration and cancellation procedures, OSU NAPIAP has completed and submitted reports on pesticide management for numerous crops in Oklahoma. Currently, three crop profiles have been completed (greenhouse, alfalfa, and watermelon) and wheat is in the final stages. Oklahoma has also played an important role in the phosphine fumigation review. Also, OSU NAPIAP included specific questions on the 1999 National Agricultural Statistics survey on wheat production. This resulted in specific

information being obtained for Oklahoma and providing USDA with a insight into wheat management practices in Oklahoma.

Registration, cancellation, and use deletion information has also been provided to grower associations and applicator groups. Close cooperation with the Oklahoma Department of Agriculture resulting in submissions by the state a number of 24c and Section 18 requests to EPA.

Funding: Smith-Lever, State

Scope of Impact: Multi-state; AR, TX

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Title: Continuing Education Programs for Oklahoma Department of Transportation Pesticide Applicators

Issue:
Oklahoma Department of Transportation (ODOT) pesticide applicators are responsible for vegetation management on over 230,000 acres of state highway and interstate rights-of-way in Oklahoma. Proper vegetation management results in a stabilized road surface that is protected from soil erosion, as well as roadsides that are attractive and that provide maximum visibility to the millions of motorists using Oklahoma's interstate/highway system.

What Has Been Done:
Pesticide applicators with the Oklahoma Dept. of Transportation have been provided research-based, state-of-the-art training on weed identification, spray equipment selection/calibration, herbicide selection and use, as well as identification of environmentally sensitive areas. A vegetation management reference manual was developed and distributed to ODOT field staff. A vegetation establishment manual has been recently developed that will be distributed shortly.

Impact:
Over 500 ODOT pesticide applicators per year have been trained in 60+ workshops during the last 4 years. Training covered proper vegetation management/weed control. Roadside acreage in Oklahoma treated with atrazine, a restricted use pesticide used for winter weed control, has been reduced from 35,936 acres in 1997 to 25,177 acres in 2000 (30% reduction). Further decreases in the number of acres treated with atrazine can be expected. Our training directly resulted in ODOT atrazine use being replaced with a herbicide treatment that poses less environmental risk, Campaign (glyphosate + 2,4-D) plus ammonium sulfate. Improved winter annual weed control also resulted, sometimes eliminating an additional mowing that would have cost $13.60+ per acre. We developed "no spray zones" on maps for ODOT where pesticide applicators no longer treat so as to protect surface water resources. Bermudagrass clear zones on the roadsides now

contain healthier bermudagrass turf, which provides better pavement and shoulder stability due to improved soil erosion control. With fewer tall weeds comes improved visibility/safety for the motorist. Ability of applicators to test new equipment will likely result in two (2) precision-agriculture sprayers being purchased by ODOT in 2001. Their use should result in less herbicide being used for vegetation encroachment control on asphalt shoulders (roadside shoulders cost in excess of $50,000 per linear mile to replace if destroyed by vegetation encroachment). Pesticide applicator continuing education programs qualify ODOT staff for internal Equipment Operator Certification, increasing the value of our training to ODOT and allowing ODOT field workers opportunities for salary improvements due to increased knowledge and skills gained.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Key Theme – Recycling

Title: Pesticide Applicator Education: Container Disposal

Issues:
Pesticide containers are to be properly rinsed and disposed. The containers are not to be re-used for any purpose. Often applicators do not properly rinse and properly dispose of the containers.

What Has Been Done:
Oklahoma State University's Pesticide Applicator Education Program (PAE) in conjunction with the Oklahoma Department of Agriculture (ODA) initiated education programs for proper rinsing and container collection programs for proper disposal. The container collection program is partially funded by ODA. ACRS and U.S. Ag Recycling out of Houston, TX conduct the collection.

Education programs on proper rinsing have been presented to applicator groups ranging from Master Gardeners to commercial and non-commercial applicators. Pressure rinsing was the main focus. Pressure rinsers were given as door prizes to stimulate rinsing. Several collections have been held across Oklahoma and a number of permanent sites have been established. This work has been in cooperation with several groups including the Oklahoma Fertilizer & Chemical Association, Oklahoma Department of Transportation, Oklahoma Agricultural Aviation Association and many other groups.

Impact:
Over the past two years, the PAE sponsored programs have collected over 40,000 pounds of pesticide containers. This represents containers that have been removed from county solid waste streams and from improper use and disposal. An additional amount of containers, exceeding PAE's collection volume, has been collected and chipped by U.S. Ag Recycles. These containers were collected by pesticide businesses that were participating in addition to the PAE program.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Key Theme – Sustainable Agriculture

Title: Demonstration of a Sustainable Integrated Production System for Native Pecan and Beef Cattle Producers and its Effect on Ecology in Flood-Prone Areas

Issue:
Some 70,000 acres of native pecans grow in river bottom, flood-prone areas in Oklahoma. Cattle are often grazed in these bottomland pecan orchards to increase overall profitability of the business. This study is targeted to enhancing pecan and beef production under these conditions through efficient resource management while minimizing environmental impact. The challenge is to balance the many factors involved in beef cattle production with the many factors involved in native pecan production and blend the two management systems in such a way as to maximize production while maintaining environmental friendliness. Separate cattle and pecan systems in non-flood areas as well as combined cattle/pecan systems in non-flood areas were used to compare with flood-prone area data. In addition, legume forage and native vegetation grazing also was compared.

What Has Been Done:
A three-year comparison of native pecan and beef cattle double cropping systems in flood or non-flood sites with or without legume forage was conducted at sites in Oklahoma and Arkansas. Legume crude protein content was greatest on flood-prone sites, according to 2000 data. Insect population varied with ground cover treatment. Diseases were effectively controlled using the Oklahoma pecan scab model <Blaze.ocs.edu/agwx/models/pecan/scab/> with three applications used in Oklahoma sites and two in Arkansas. Insect management was accomplished by careful scouting for incidence of pecan weevil, pecan nut casebearer, and pecan aphid, as well as for beneficials such as lady beetles and lacewings. Insect populations were generally larger in the grazed versus ungrazed plots and in the flood versus non-flood areas. Grazing in 1999 situations

increased nut production. All cattle produced better on legumes than on native vegetation, and better on legumes on flood-prone areas than non-flood areas. However, cattle gained as much as 60 pounds an acre more on non-flood native vegetation than on vegetation in flood-prone areas.

Impact(s):
Beef cattle and pecan orchards are more than compatible. When managed carefully, they can be profitable and environmentally friendly. Vegetation offered in flood-prone areas must contain legumes, which stand up to periodical flooding better than native vegetation. The use of legumes under careful management will reduce or eliminate the amount of nitrogen fertilizer required, and increase beef yield per acre.

Funding Sources: Smith Lever; State; Southern Region Sustainable Agricultural Research and Education Program

Scope of Impact: Multi-state Integrated Research and Extension - AR

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Key Theme – Water Quality

Title: Pond Management

Issue:
There are over 200,000 ponds in Oklahoma, most of which receive little or no management. Muddiness, excessive plant growth, poor fishing, fish kills and poor quality water for livestock watering are common problems faced by landowners.

What Has Been Done:
The project leader responds to hundreds of pond owner requests for assistance each year in addition to authoring pond fact sheets and newsletter articles and making presentations at pond management workshops around the state. Aquatic weed identification and up to date management options for specific weeds are covered in a section of the yearly publication, "OSU Extension Agents' Handbook of Insect, Plant Disease and Weed Control." Water testing and fish disease diagnostic services are offered at Ada. Select new Extension Agriculture Educators have been trained in solving common pond problems.

Impact(s):
- Improved property values by those following through on advice relating to improved pond management practices.
- Improved fishing through proper pond stocking and harvesting practices.

- Improved pond appearance and quality of water for livestock watering in ponds where livestock damage has been reduced by limiting shoreline access.

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Title: Nursery Water Quality Educational Program

Issue:
A lack of agricultural engineering technology assistance for water capture and treatment is a problem. Considerations as well as growers not always observing best management practices to ensure high water quality standards exist in the State of Oklahoma. The green industry is often targeted for any real or perceived ground and surface water contamination in a given area.

What Has Been Done:
Oklahoma State University Cooperative Extension Personnel from the Departments of Horticulture and Landscape Architecture, Entomology and Plant pathology as well as Biosystems and Agricultural Engineering have created a complete water quality extension program targeted at nursery, greenhouses and garden centers throughout Oklahoma. Various regional workshops on site at leading nurseries have been conducted and backed up with an extension water quality handbook as well as educational posters to be displayed at green industry locations statewide

Impact:
Nursery personnel attended and learned new key best management practices as a result of regionally conducted on-site nursery water quality workshops. Water Quality Handbook for Nurseries E-951, Oklahoma State University was developed. There is a website: zoospore.okstate.edu/nursery. Upon the completion of a statewide water quality training program including several regional nursery based water quality workshops, growers are now at least considering the implementation of best management practices that will not only continue to ensure a high quality crop but also help the operation be more environmentally friendly.

Funding Sources: Smith Lever; State Appropriations; Oklahoma Dept. of Agriculture

Scope of Impact: State Specific

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Title: Water Testing in Rural Minority Communities

Issue:
Historically black and other minority communities of Oklahoma are under-served in terms of educational programs on drinking water quality, community wellhead protection, and waste management. These elderly, low-literacy, low-income populations have special needs in an educational program.

What Has Been Done:
Oklahoma State University and Langston University collaborated to hire and train a paraprofessional from the target community and to tailor educational materials to make them accessible to people with limited reading skills. The paraprofessional distributed educational materials and worked one-on-one with individuals to complete the HOME*A*SYST risk assessments worksheets and collect water samples for bacterial analysis. She also scheduled and advertised educational meetings to increase public understanding of safe and sanitary drinking water and waste management rules and recommendations. The paraprofessional was provided with a notebook computer, GPS receiver, and database training so that she could enter project data and help analyze the nature and extent of water quality problems in these rural minority communities.

Impact:
The paraprofessional was responsible for drawing a large number of minority residents of Okfuskee, Creek, and Muskogee counties into Cooperative Extension meetings. These people are generally hard to reach and do not attend such meetings. With her help, participants completed 116 Home*A*Syst site assessments and collected 169 water samples for analysis by the Department of Environmental Quality for coliform bacteria.
Evaluation of project data showed 39% of the water wells did not meet the Safe Drinking Water Standard for total coliform bacteria,. However, 76% of these wells were improved through shock chlorination and other measures, which the paraprofessional and other project personnel taught the participants.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Oklahom*A*Syst

Issue:
Approximately 80% of Oklahoma's rural residents drink ground water. Many who use private water wells as their drinking water source are drinking poor quality water. Their water may be putting their health at risk due to contamination by bacteria and nitrate. The risk of water well contamination can be reduced significantly if well owners are educated to eliminate high-risk activities carried out on their property. Most people give little consideration to the maintenance and protection of their water wells, and few know which actions increase risk of contamination.

What Has Been Done:
The Oklahom*A*Syst program has developed a series of work sheets to help land owners evaluate the level of contamination risk that exists on their property. They evaluate proper well construction, how to maintain their household wastewater system, how to properly handle and dispose of hazardous household products, how to store and handle liquid fuels, and how to manage animal waste, pesticides and fertilizer if they are involved in agricultural production. The work sheets ask a series of questions that rank their level of risk. If they need more information, fact sheets answer basic questions for them, or direct them to government agencies that have personnel who can assist them. Based on their responses to the work sheet questions, they can then correct any deficiencies identified and reduce their risk of contamination.

Impact:
In the last year seven educational meetings in seven counties were attended by 95 people who learned how to protect their water wells. Since the program began in 1995, a total of approximately 1400 people have attended educational programs, had their water screened for nitrate and other mineral constituents and received assessment packets. Water tests revealed that 14% had water with nitrate levels above the federal standard for drinking water. 341 of those participating also had their water tested for coliform bacteria, with 41% testing positive. Those with positive tests were instructed how to purify their well with chlorine bleach. Two surveys conducted among program attendees since its inception found that 26% of participants did a site assessment on their property and assessed either their water well condition, wastewater system condition or other risk level after the meeting. 45% of the survey respondents reported making changes in practices that protected their well after the assessments, including well chlorination, changing hazardous product disposal practices, moving fuel storage sites, altering pesticide use and new well construction. The cost of the changes ranged from $0 to over $3400. Another 23% anticipated making changes but had not yet due to lack of funds, time or other resources.

Funding: Smith-Lever

Scope of Impact: State Specific

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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; consumer horticulture, home gardening, and landscaping; applications engineers; family economic well-being; family resiliency; water quality; 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". Also the OCES 5-year plan of work includes several key program components under this goal that CSREES choose to include under goal 1, such as, consumer horticulture and home horticulture. Thus some reporting discontinuities may exist between what is reported in the overview and under key themes. During the year, 9,000 demonstrations, meetings and conferences (not including 4-H youth) were conducted under this goal. An additional, 27,100 visits and consultations were conducted by OCES personnel with non-youth audiences. These activities were attended by 264,000 participants during the year (an additional 400,000 participants attended the youth activities). Approximately 50,000 of the non-youth participants represented non-white audiences. This constitutes about 19% of the attendees as compared to 25% in the general population of Oklahoma. Several programs contributing to this goal train and use large contingents of volunteers. Volunteers contributed over 25,000 days during the year to support and help deliver programs under this goal.

Educational and service programming under this goal really fall into four major areas. The first is the area related to community 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 five years. And these programs continue to grow. The other three major program areas under this goal are very high contact programs. Particularly high contact 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 huge volunteer effort mentioned above.

During the year, the Applications Engineers served more than 100, mostly rural, manufacturers that employ more than 3,000 citizens. The engineering assistance in the client projects resulted in over $3 million of sales for these firms - $1.4 million of which would have been lost to the local economy due to relocation. In addition, the applications engineering program documented 147 new jobs created from assistance ans 12 jobs retained. The Oklahoma home-based and micro business program has worked with 23,000 over its 15-year life. Studies have shown that

80% of those businesses working with OCES were still in business after four years - compared to an industry average of 60%. A recent survey also shows that 28% of those worked with started a new business during the period resulting in over $1 million of income annually to local economies. Not only do the 4-H Youth programs add much to the youth, the youth also give back much to the community. For example, through community service activities reported by 217 clubs in a one-year period had a $5 million plus impact on their communities. Those reporting indicated that 1,308 separate projects were conducted in a recent year. In order to develop strategic economic development in communities, often local leaders look to the OCES for a Gap Analysis. This extensive trends analysis served as the basis for 15 communities during the last year to begin important strategic planning assisted by the OCES. Most of the local communities have already put many of the programs derived from the planning into effect, thus improving their sustainability and the quality of life for the citizens.

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 $12.3 million with $2.3 million from Smith Lever funds. About 150 professional and paraprofessional FTEs contributed to the goal last year.

Goal 5 – Key Themes

Key Theme – Agricultural Financial Management

Title: Oklahoma Cooperative Extension's IFMAPS Program Gives Farmers and Ranchers Management/Planning Support

Issue:
Making good financial management decisions is a constant and sometimes ominous challenge for Oklahoma farmers and ranchers.

What Has Been Done:
Financial pressures can make farmers and ranchers feel at times as if they have no place to turn. But in Oklahoma, there is help through the Intensive Financial Management and Planning Support (IFMAPS) program, sponsored by the Oklahoma Cooperative Extension Service. When producers are ready to study their personal situation critically, they can get individual and confidential help. The IFMAPS program was designed to provide producers with comprehensive materials and assistance plus help them prepare financial statements, farm budgets, and marketing plans. Procedures used by IFMAPS include one-to-one assistance, workshops, cooperative efforts with non-extension agencies and groups, financial management training, resource materials, computer software, and referrals.

Area Extension Agricultural Economic Specialists plus part-time IFMAPS specialists provide one-on-one assistance in financial management and planning throughout the state. Producers call the local extension office, the IFMAPS toll-free number, Area Specialists or IFMAPS specialists to request assistance. Agricultural lenders, attorneys, clergy, and Extension staff make referrals. IFMAPS staff assist farm families in developing and analyzing alternative farm financial plans. Alternatives may include asset restructuring, new or different farm enterprises, adding to or reducing the size of existing enterprises, improving resource use, increasing income from off-farm work, developing more efficient management techniques, debt restructuring, liquidating the farm partially or completely.

In fiscal year 2000, 204 farm families received individual financial analysis assistance; from FY 94-00, more than 1,600 farm families received the service.

Impact(s):
Farm families that receive individual assistance are better able to organize their financial information, evaluate this information, and make informed decisions about their operations. These skills benefit farmers and ranchers in two ways: 1) they improve management skills which lead to improved business operations; 2) they encourage the operators to continue learning more about farm financial management.

IFMAPS staff also help families identify other resources available to help solve production and marketing problems and answer legal and tax questions. IFMAPS personnel help farm families prepare farm plans to apply for Farm Service Agency guaranteed loans or to prepare for restructuring loans. IFMAPS helps inform young and beginning farmers about Oklahoma and FSA beginning farmer loan programs through publications, meetings and individual contacts. IFMAPS staff assist with Quicken® workshops which show farmers and ranchers how to use this

software to keep more accurate farm financial records. The staff also developed a series of farm financial statements fact sheets that conform to Farm Financial Standards Council recommendations for financial reporting. All are available on the Oklahoma Cooperative Extension web site: http://agweb.okstate.edu/pearl/agecon/tax/
IFMAPS staff help producers develop the plans needed to qualify for the Oklahoma Agricultural Linked Deposit Program (OALDP). The number of farm plans developed by IFMAPS staff for producers to qualify for this program and the estimated savings in interest expenses to the producers is:

	FY 2000	**FY 99-00**
First-time Applicants	125	222
Estimated average loan size	$204,601	$209,342

Estimated interest savings per loan (3 %) per year = $6,138
Estimated Total interest savings per year = $681,318

Funding: Smith-Lever: State; plus federal USDA grants.

Scope of Impact: State Specific

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Title: Quicken for Farm Financial Records

Issue:
Farmers do not need to spend a large sum of money to computerize their financial records. "Hands on" workshops and step-by-step instructions demonstrate how to adopt Quicken, a popular, inexpensive personal financial record keeping package for farm and ranch use.

What Has Been Done:
Thousands of producers have received assistance in getting a better handle on their financial situation. Workshops are conducted on request and have been held in many counties. In addition to training for in-state educators, training for agents in other states has been provided. Workshops have also been conducted at national producer meetings. Workshop participants and notebook purchasers continue to receive support through a quarterly newsletter with financial management tips. They also have access to instructions and newsletters via the Internet at http://www.agecon.okstate.edu/quicken.

Impacts:
Having computerized financial records makes summarizing information to analyze decisions a snap. More informed decisions enhance prospects for profitability. And, certainly not least, reports for lenders and the IRS are much less painful to develop. Producers who have

participated in workshops indicate that they gain new skills as well as confidence in using the computer in their business. They begin to think about sorting their income and expenses by enterprise to identify profit and loss centers on the farm

Funding: Smith-Lever**;** State

Scope of Impact: State Specific

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Title: Federal & State Taxation Education

Issue:
Federal and state taxation impacts every individual's business and personal decisions. Agra-business owners, agricultural producers, and employees success in achieving business and personal goals is in part dependent on an understanding of how taxes effect disposable income. Taxes include, income, sales, ad valorum, self-employment, social security, as well as estate and gift tax. For many individuals, more than one-half of net income is consumed by taxes. Specifically, individuals want to pay the minimum amount of tax or maximize the benefits paid to them. Typically, the individual objective is constrained or limited by a set of personal or business preferences that can be more important to the individual than tax savings.

What Has Been Done:
The Farm & Business Tax Institutes are a series of nine (11) 2-day income tax update seminars and is truly a team effort. Sixteen hours (16) of continuing professional education are provided to more than 2,200 CPA's, Attorneys, and tax professionals. An additional seminar was presented to 130 IRS and Oklahoma Tax Commission employees.

The University of Illinois and a committee of Extension professionals throughout the nation jointly develop the educational materials that are the basis for seminars taught in 43 states. More than 41,000 tax professionals attend these seminars and prepare approximately 825,000 farm tax returns and 5 million total tax returns in the United States. The teamwork involved in this project extends to national levels as well as state and local cooperation.

The National Extension Advisory Committee on federal taxation cooperates with IRS and USDA in Washington D.C. writes the IRS Publication 225, Farmer's tax guide. The committee meets with and briefs the Congressional Joint Committee on Taxation on Agricultural taxation problems and issues.

County and Area Producer tax programs conducted by Area Agents. Answer Questions and solve individual problems for Producers, Extension personal, College of Ag Faculty and staff, and tax preparers. Sunup TV programs, Agri-talk national Ag Radio programs, presentations and training for Tax preparer associations, producer organizations, Vo-tech Farm Business advisors, and Young Farmer groups. Timely articles for Ag publications and the Farmer's Stockman Outlook Article, and OSU fact sheets and current reports.

Impact:
Evaluation statistics indicate that participants in this program file more than 90% of the tax returns filed by Oklahoma farmers and ranchers. For more than 35% of the participants, this is the only educational seminar they attend and their only source of tax preparation materials for the coming year. On a national basis, the Institute materials are taught in 43 states. More than 41,000 tax professionals attend these seminars nationally, and prepare approximately 825,000 farm tax returns and 5 million total tax returns in the United States. National Extension Advisory Committee on federal taxation which cooperates with IRS and USDA in Washington D.C. to write the IRS Publication 225, Farmer's Tax Guide. This publication is distributed to more than 12,000 individual farmers and tax preparers in Oklahoma each year. Nationwide, more than 300,000 Farmer's tax guides are distributed each year.

Funding: Smith-Lever, State

Scope of Impact: Multi-state; National

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Key Theme – Child Care/Dependent Care

Title: Caregiving From a Distance

Issue:
Providing quality care when the elderly family member lives a distance from the caregiver family. The elder population is continuing to grow at a rapid rate. A whole generation of people are living into their 80s and 90s. It is difficult to prepare family caregivers for the challenge of taking care of an elderly person, especially when the caregivers do not live near the elderly person. In Oklahoma, nearly 18 percent of the population is over the age of 60. These people often are faced with the challenge of becoming old themselves and having to take care of very old family members. Due to rising costs in health care, families are increasingly providing care for persons at home. With today's families being more mobile, family caregivers have the added challenge of providing care when they live some distance away. They may also be providing care to their own children or grandchildren.

What Has Been Done:
Oklahoma State University Cooperative Extension has developed an educational program for caregivers and in-services are offered to FCS Extension educators in the following areas: Caregiving from a Distance; The Sandwich Generation; Deciding Where to Live in Retirement; De-stressing the Caregiver; and Providing Long-Term Care. In addition, Extension has partnered with the Oklahoma State Department of Human Services and presented this workshop at a seven-state regional conference and at a statewide conference on aging and eldercare.

Impact:
Research indicates that caregivers participating in this educational program will learn to involve an older family member in decision-making as much as possible; use non-threatening strategies to get cooperation from family members in giving care to the older person; learn stress reduction strategies; understand limits for providing personal care; and learn to cope with the stress of caregiving by joining a caregiver support group in the local community.

Funding Sources: Hatch; Smith-Lever; State

Scope of Impact: Integrated Research and Extension

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Key Theme – Community Development

Title: Gap Analysis: A Tool for Community Economic Development

Issue:
All members of a community, even those with very low incomes, have money to spend. Every household is a consumer of retail products since it must buy food, clothing, and other everyday items. Those retail dollars either stay within the local economy or they leave the local economy. If dollars remain in the local economy, the benefits associated with them will also remain. Furthermore, as those dollars re-circulate within the local economy, more economic growth is possible. Of course, no person can be induced to make every purchase in their own city or town, but the healthiest economies will attract a large portion of local consumers' dollars. In recent years, organizations such as Main Street have played an important role in educating local citizens specifically in issues of retail competitiveness and in issues of economic development in general. As a result, the nation's small cities and towns have placed a renewed emphasis on economic development through the retention of local retail dollars. This new emphasis has created a need for reliable retail data and educated analysis within these communities.

What Has Been Done:
The Oklahoma Cooperative Extension Service has responded to this need by offering a Retail Trends and Taxable Sales Analysis to communities that request it. The analysis includes a written report and a presentation (upon request). An example of one such report, conducted for Stroud, OK may be viewed at the followed web address: http://www.agecon.okstate.edu/community/Stroud%20for%20Web.pdf. This report has come to be known as the "Gap Analysis." From June 1, 1999 to June 1, 2000, this analysis was conducted for 15 communities in 12 counties of Oklahoma. The communities represented a population of 172,890 and total retail sales of $1.98 billion for fiscal year 1999. To determine the local impact, a survey was sent to each County Extension Director who was involved with one of these reports. In some cases, the director also forwarded a copy of the survey to community partners who were involved with the study.

Impact(s):
Overwhelmingly, the response by communities for the retail trends report was positive. The best response, however, appeared to come from communities that already had a mechanism in place for accepting, studying, and disseminating the data. For example, the Economic Restructuring Committee of Stillwater Main Street immediately began to use the information to promote a shop downtown first attitude. The Chickasha Chamber of Commerce set up a special committee designed to analyze and use the data. The City of Guthrie accepted the report knowing that they would use it to contribute to their own market analysis of their city.

Funding Sources: Hatch Act; Smith-Lever; State Appropriations

Scope of Impact: Integrated Research and Extension

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Title: Community Health Planning Process: The Oklahoma Model

Issue:
To prevent the loss of local community hospitals that begin a downward spiral of economic deterioration brought on by the subsequent loss of physicians, closing of nursing homes, decline in health-related services, and loss of what is often a community's second or third largest employer (direct and indirect effects). The challenge is to help community leaders avert the loss of their rural hospitals through participating in a community health planning process to convert the rural hospital to a Critical Care Access Hospital designation.

What Has Been Done:
The Community Health Planning Resource Team has worked with key leaders in 15 Oklahoma communities, providing needed information about the health care sector and the specific, local

economic effects each county's health care sector provides, as well as what it takes to convert a rural hospital to CAH designation.

Impact(s):
Several hospitals have realized a budget turn-around from a deficit of several thousand dollars per year to a budget surplus of $250,000 or more per year. The 15 communities involved have completed a process that includes identification of health and social resources in the community, data and information about health and behavior indicators, identification of the economic effect of the health care sector on the community, and a survey of residents regarding their perceptions about the health care sector. Community leaders thus are able to formulate action plans to increase use of local health care services, change health risk behaviors, and strengthen local health care services.

Funding Sources: Smith-Lever; State Appropriations

Scope of Impact: State Specific

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Title: County Government Finance

Issue:
In the mid 1930's the Oklahoma Constitution was amended to allow county government to receive only ten mills of ad valorem tax for the support of county government. In the following years and especially starting in the 1960's inflation begin to drastically affect the ability of county government to provide constitutionally mandated and necessary services. In fact, many counties were on the verge of bankruptcy. In 1983 the Oklahoma Legislature passed legislation that allows County Commissioners to call an election to vote on a sales tax to support county government. The sales tax can be no more than 2%.

What Has Been Done:
County Commissioners requested assistance from OCES Rural Development staff to educate them on what the new law provided, and assist in educating the public on the impact of a county sales tax. Two programs were developed to help the County Commissioners. A "County Financial Trends Analysis" program to help track county expenditures and a "Mechanics of A County Sales Tax" program to help county commissioners and citizens understand the sales tax election process and its impact on county government.

Impact:
Since the law was passed, 64 of Oklahoma's 77 counties have adopted a sales tax. OCES staff has developed educational programs for almost all of the 64 counties. Last year (FY 2001) over

$91,000,000 in sales tax revenue was collected in the 64 counties. The money helps County Commissioners provide necessary programs and services for the citizens of their counties.

Funding: Smith-Lever, State

Scope of Impact: State Specific

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Title: Applications Engineers

Issue:
There are more than 5,600 manufacturing firms in Oklahoma and all but 58 are small (less than 500 employees). More than 4,800 of these firms employ fewer than 250 and approximately half of these small firms are located in rural areas. These rural manufacturers 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.

What Has Been Done:
During 2000 the Applications Engineers served more than 100 small, mostly rural, manufacturers that employ more than 3,000 of our citizens. This effort included more than 2,000 hours of direct in-plant 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.

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 is asked a series of questions to designed to assess the impact of the effort. In 2000, the Applications Engineers client projects had the following impacts:

Sales increase	$3,144,000.00
Sales retained that would have otherwise been lost	$1,425,000.00
Cost savings	$1,307,000.00
Costs avoided	$162,000.00
147 new jobs created at $50,000.00 per job	$7,350,000.00
12 jobs retained at $50,000.00 per job	$600,000.00
Total impact	$13,988,000.00

Funding: State

Scope of Impact: State Specific

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Title: Oklahoma Team Leadership Program (OTLP)

Issue:
Preparing Oklahomans to identify and act on public issues affecting individuals, families and the community. Oklahomans have become increasing concerned about the direction of the state, its institutions and its economic climate. The Oklahoma Academy for State Goals commissioned a study of Oklahoma's future toward the year 2005 that concluded the following: "Oklahoma citizens can look forward to prosperity, good government and healthy communities, but good things will not come automatically. They will require leadership, hard work, commitment to high goals, good management and good luck." A key element to Oklahoma's future is the development of the leadership potential of it's citizenry.

What Has Been Done:
OCES collaborates with the Oklahoma Home and Community Education organization to develop and implement the Oklahoma Team Leadership Program (OTLP). OTLP has the following objectives: 1) Enhance grassroots leadership development by making the program available to those who do not have the opportunity to participate in other leadership programs; 2) Enhance leadership development which results in public activism; 3) Assist local community leadership to function more effectively. The OTLP conducted leadership classes in 32 counties. In addition, the OTLP operates a mini-grant program to facilitate community projects designed to foster leadership activism and sponsors one-day regional conference to enhance the leadership potential of citizens.

Impact(s):
More than 250 individuals have been prepared for community leaderships roles on county leadership teams. They have implemented numerous community projects such as solid waste management to coping with family violence. In 1998, the Pushmataha County leadership team received a national award for leadership in acting on public issues and develop[ing a more informed citizenry. In 1996, the study of the long-term impact of the program concluded that community-based leadership activities continued among program participants for up to seven years. These activities expanded to foster leadership activities in other communities, thus yielding a long-term multiplier effect. In 1998, a study of the immediate impact of two one-day regional leadership conferences using retrospective pretesting revealed that participants learned leadership skills that they intended to apply in their communities. In 2000, long-term outcomes of those two leadership conferences were studies. A total of 48 participants were surveyed. It was concluded that 85 percent indicated an increased awareness of their leadership potential and 46 percent indicated increased community involvement.

Funding: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Family Resource Management

Title: Keys to Successful Life Choices

Issue:
Assisting pre-release offenders for re-integration into community life: Oklahoma ranks first in the nation in number of women per capita incarcerated in correctional facilities and third for men. The average annual cost of incarceration in a minimum-security facility is $12,740. Medium-security costs taxpayers more than $15,000 annually per offender. Upon release, many male and female offenders encounter employment difficulties and lack basic living skills that will help provide a successful transition into a community.

What Has Been Done:
OCES has implemented and evaluated a “basic skills in resource management education program” in 22 Department of Corrections minimum- and medium-security facilities. A two-day training session on program implementation has been provided for 221 caseworkers and counselors of the Oklahoma Department of Corrections.

Impact:
Results of the program are measured by pre- and post-knowledge tests and indicate a significant increase in knowledge. Data from 776 offenders have been entered and analyzed. Offenders showed they gained knowledge in 14 out of 20 areas assessed, including appropriate job references, answering job interview questions, salary, home insurance, housing costs, car insurance, proof of identity, contracts, rent-to-own interest rates, payroll deductions, handling work issues, community resources, credit reports, consumer rights and public housing. The cost of this program is $63 per offender. It is estimated that taxpayers would save $12,677 for each offender not returning to Department of Corrections confinement.

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Home-based Business Education

Title: Economic Development Through Micro 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 is the economic situation (OCES, 1989, 1994). In Oklahoma, those economic reasons develop from our ranking of 46th in individual per capita income and 41st in the number of people at or below poverty (1995 Statistical Abstract). Other reasons are: lifestyle changes, increased family time, being one's own boss, and entrepreneurship.

What Has Been Done:
In 1985, OCES recognized the growing trend of people working at home. 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:
Over 23,000 home -based and micro businesses have been assisted.
There are 125,000 home -based businesses in Oklahoma with an average income $24,374; totaling a $3 billion annual economic impact. Studies of the businesses worked with have

shown that over 80% of home-based businesses contacting the program are still in business after four years. This compares favorably to Dun and Bradstreet's 1994 report that only 60% of small businesses survive that long. In a 1998/99 survey, 28% of respondents have started a business. With an average income, this means over $1,000,000 has been added to the local economy.

Funding: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Leadership Training and Development

Title: Oklahoma Family Community Leadership

Issue:
The success of self-government depends on a citizenry that is knowledgeable about public issues and how to act on them. The Oklahoma Academy for State Goals commissioned a study of Oklahoma's future that included the following: "Oklahoma citizens can look forward to prosperity, good government, and healthy communities. But good things will not come automatically; they will require leadership, hard work, commitment to high goals, good management, and good luck." A key element to Oklahoma's future is the development of the leadership potential of its citizenry.

What Has Been Done:
The Oklahoma Cooperative Extension Service collaborated with the Oklahoma Association for Family and Community Education to develop and implement the Oklahoma Family Community Leadership Program (OFCLP), which has the following objectives: o Enhance grassroots leadership development by making the program available to persons who do not have the opportunity to participate in other leadership programs. o Enhance leadership development that results in public activism. o Assist local community leadership to function more effectively. The OFCLP conducted Leadership Classes I-VII in 32 counties. In addition, the OFCLP operates a mini-grant program to facilitate community projects designed to foster leadership activism and sponsors one-day regional conferences to enhance the leadership potential of citizens.

Impact:
An analysis of the long-term impact of the OFCLP concluded that community-based leadership activities continued among program participants for up to seven years. Furthermore, these activities expanded to foster leadership activities in other communities, thus yielding a long-term multiplier effect. A study of the immediate impact of a regional conference revealed that significant learning had occurred. In addition, participants who responded reported that they had

developed substantive plans of action for implementation when they returned to their communities. As one participant commented, "The training gave team members the self-confidence to plan, implement, and evaluate their programs." Another responded, "[the Oklahoma Family Community Leadership Program] gives local people the encouragement and confidence to tackle a program."

Funding: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Parenting

Title: Guiding Young Children

Issue:
Child Abuse Prevention: In FY 1997, Oklahoma reported a record high of 45 child deaths from child abuse. Of the 61,709 cases investigated, 27 percent were confirmed. Reported and confirmed cases of child abuse and neglect in Oklahoma have nearly doubled in the last five years. Judges, counselors and caseworkers require parents at risk for child abuse to attend parenting classes. These classes are part of their written plan for gaining or retaining custody or visitation rights.

What Has Been Done:
Parents become aware of their need to be better parents. They learn new parenting strategies and adopt four new guidance techniques, including praise, wording instructions as do's instead of don'ts, rules and consequences. Parents felt they were more in control and things were calmer at home due to the educational information they had received.

Impact(s):
Taxpayers save the cost of foster case and the social and psychological impact of abandonment when children can live safely with their parents. As measured by the Adolescent Adult Parenting Inventory, parents at risk for child abuse and neglect prior to the classes were not at risk following the classes. This program, also used in California, Massachusetts, New Jersey and Virginia, was selected for the National Extension parent education model of critical parenting practices.

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Workforce Preparation – Youth and Adult

Title: High School Financial Planning Program

Issue:
Teens gain valuable financial skills and confidence through the study of this program. These are skills they will use throughout their lives. One goal of education is to help young people become employable citizens and to enhance the well being of their adult years. Unfortunately, many students graduate without the skills to manage personal finances wisely. Considering current trends of rising personal bankruptcies, consumer credit delinquencies and inadequate savings for emergencies and retirement among adults, this program is much needed. A recent nationwide survey reported teenagers are progressing into adulthood without the basic skills and knowledge it takes to make educated financial decisions. The study indicated just over half of the teens surveyed could correctly answer questions on topics of credit use, budgeting, taxes, retirement, insurance and inflation.

What Has Been Done:
Ten years ago, the Oklahoma Cooperative Extension Service partnered with the National Endowment for Financial Education. This effort has educated high school students about basic money management and financial planning concepts. Nearly 32,000 Oklahoma high school students have increased their knowledge of money management skills since the program started. County Extension educators assist the high school teachers in implementing HSFPP

Impact(s):
Significant and positive changes in personal financial knowledge, behavior and confidence were shown to have been made during a nationwide evaluation of teens that studied the High School Financial Planning Program. As a result of the HSFPP, 31 percent started a savings program; 15 percent began saving more than they had previously; 35 percent improved skills for tracking spending; 49 percent improved their knowledge about investments; 39 percent reported believing that how they managed money would affect their future; and 42 percent felt more confident about managing their money.

Funding Sources: Smith-Lever; State

Scope of Impact: State Specific

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Key Theme – Youth Development/4-H

Title: Impact of 4-H Service on Oklahoma Communities

Issue:
4-H has a long tradition of providing community service opportunities for youth and volunteers, yet not effort has been made to determine how much service is actually done or what the quantifiable value is of that service. Extension staff was to collect summaries for a 12-month period from volunteers regarding service projects conducted and the number of youth and adults involved and the amount of time spent on those projects.

Impact:
Based upon the US Department of Labor minimum wage, the 217 4-H clubs that reported service hours in 1998 made a $5,489,274.28 impact on Oklahoma communities. The survey of Oklahoma 4-H clubs indicated that 4-H members and leaders make significant contributions to their communities through community service projects.

Of the 77 counties in Oklahoma, 58 (75.32 percent) reported community service projects during the reporting period. Those reports represented 1,308 total service projects that involved a total of 19,001 4-H Youth. While there were 21,646 members enrolled in the 4-H program at the time, so it can be assumed that many youth participated in multiple projects during the reporting period and that many did projects that were not reported. Of the state's 936 recognized clubs 23.18 percent (217) of the different clubs submitted one or more reports. Forty-three of the counties that submitted reports provided 40 or more entries or activities.

The findings of the study indicate that many 4-H clubs actively conduct community service projects as a part of the total 4-H learning experience even though some clubs appear to do significantly more projects than do others. One county submitted reports that summarized 123 different activities while others reported only one. The reports indicate that the promotion of food and fiber is an important part of the 4-H experience for some youth in Oklahoma with those who participated in this area recording large numbers of hours. While this topic had the largest number of hours reported, it was discovered that in selected counties this was attributed to a few major projects such as learning labs and demonstrations at fairs and other events. Some of the other projects that involved large number of youth included working with children and youth, helping the disadvantaged, and promoting safety and healthy living, and helping people with disabilities.

Leaders play a major role in supporting youth in clubs. The study showed that they provided large numbers of hours in supporting the 4-H program in general with 1,881 reports representing 15,885 hours of service related to this area.

Funding: Smith-Lever; State

Scope of Impact: State Specific

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Title: Environmental Education for Youth: Caring for Planet Earth

Issue:

Developing an appreciation and understanding of environmental values on the part of young people will lead to a more informed and environmentally conscious public in the next generation. We are nearing the end of a century in which there has been serious abuse of Oklahoma's natural resources. Soil erosion, hydrocarbon and salt pollution, and widespread use of pesticides as well as destruction of wetlands and riparian vegetation have left streams, lakes, and ground water in a degraded condition. There are also serious threats to Oklahoma's biodiversity. High quality natural resources, healthy biodiversity, and clean water and air are crucial to the state's future.

What Has Been Done:

Recognizing the importance of environmental education for the youth of Oklahoma, the OSU Departments of Entomology and Plant Pathology, Biosystems and Agricultural Engineering, Plant and Soil Sciences, and Forestry worked with the state 4-H Program to develop "Caring for Planet Earth," an interactive environmental education exhibit. Since 1992, thousands of young people and their families have experienced this highly popular exhibit. The exhibit's hands-on activities highlight the diversity and uniqueness of insects, fish, and aquatic animals. Children and their parents handle and learn about exotic insects, butterflies, crawdads, and other animals, and they observe the process of stream bank erosion in the stream hydrology model. All components of the display are attended by university faculty, Extension educators, and 4-H volunteers, who discuss the exhibits. Teacher packets are provided for some elements of the display. Highlights of the 1998 exhibit included the Oklahoma Mesonet (the statewide weather monitoring system), a "tornado machine," a stream hydrology model, and a vermicomposting bin, where worms could be seen stabilizing household trash.

Set up annually at the Tulsa State Fair, the "Caring for Planet Earth" exhibit has given thousands of youth, their parents, and their teachers an opportunity to experience some of the values of their environment and to understand its need for protection. In 1998, more than 30,000 participants, including students and grade school teachers from the Tulsa Public Schools, visited the exhibit.

The exhibit is staffed throughout the 11-day Tulsa State Fair by volunteers from the OSU Cooperative Extension Service, 4-H'ers, and other volunteers from across the state.

Impact:
The long-term impact of "Caring for Planet Earth" will become evident over many years. In the short-term its impact is apparent in the number of young people, parents, and teachers who look for the exhibit year after year. Ultimately, the goal of "Caring for Planet Earth" is to promote understanding and appreciation of environmental issues among the citizens of the state of Oklahoma.

Funding Sources: Smith-Lever; State Appropriations

Scope of Impact: State Specific

Contact:
Billie Chambers, 4-H Program Specialist
205 Poultry, OSU
Stillwater, OK 74078-6063
Phone: 405-744-5391
E-mail: bcham@okstate.edu

Key Theme – Youth Farm Safety

Title: Youth Tractor and Machinery Operator Certification

Issue:
Providing training to certify 14 and 15 year old youth to qualify them to legally be hired to work on a farm, running agriculture machinery and other hazardous activities. The challenge is to meet the demand to properly prepare and certify youth under 16 years of age to the standards prescribed under subpart E-1 of Part 1500 of Title 29 of the Code of Federal Regulations of the Fair Labor Standards Act.

What Has Been Done:
Extension Educators with 4-H responsibilities in the Northwest District have taken the lead for a number of years in providing 14 and 15-year-old youth the mandated tractor and machinery operator training. The program provides the youth participants with a strong safety background and prepares them to legally be hired to work on a farm, running agriculture machinery and various other hazardous activities that might be involved. Many of the youth participants come from outside the district or even beyond the state lines to participate in the training offered throughout Northwest Oklahoma.

Each of the staffed Extension Offices in the Northwest District provides this valuable and mandated training. Some of the trainings are held on county level and others on a multi-county basis where Extension Educators rotate hosting the event annually. Program content varies from county to county as each one utilizes a variety of local resources and presenters beyond the Hobar Publication, Safe Operation of Agriculture Equipment and companion videos. They have included farm equipment dealers/employees, Oklahoma Highway Patrols, medical and

emergency professional, rural electric personnel, Ag Education teachers, farm organization staff and volunteers, and local agricultural producers. To supplement the educational process they also utilized the "head over wheels model", grain flow wagon, and other hands-on activities to get their points across as well as keeping interest of the youth.

In the spring of 1999 the 24 hour plus training program was held in twelve locations throughout Northwest District reaching 179 youth participants. The group included 162 males, and 17 females of which 7 were American Indian, 2 were Hispanic origin and the remaining 170 were Caucasian. Data for the 2000 training sessions are currently being finalized.

Impact(s): A written pre- and post-test was administered to three of the groups:

	Avg. Pre	**Avg. Post**	**Change**
Group One	62.27	92.01	+29.74
Group Two	65.34	94.67	+29.35
Group Three	73.85	95.75	+21.90
Average	67.15	94.14	+26.99

A second part to the certification process is passing a driving test, which includes both pulling and backing a two-wheeled implement. Certification is presented to youth only after passing a written test and exhibiting their driving ability by successful completing the driving exam. In addition, four counties are involved in teaching Farm Safety at an earlier age through annual Farm Safety Day camps. These day camps often reach parents along with nearly 400 elementary age youth annually.

An expanded and well-trained employee resource was achieved for farm operators in Northwest Oklahoma and throughout the state. The workshops and programming offered is resulting in improved test scores as shown by improved test scores of selected groups, which were administered per and post test. Younger children living or visiting farms are more aware of the dangers that are present and cautions they need to take.

Funding: Smith-Lever; State

Scope of Impact: State Specific

Contact:
Kevin R. Hackett
Northwest District 4-H Program Specialist
205 West Maple, Suite 612
Enid, Oklahoma 73701
Tel: (580) 233~5295
Email: hackett@okstate.edu

Title: Livestock Safety for Kids

Issue:
Over 30,000 agricultural related injuries occurred to children or adolescents who lived on, worked on, or visited a farm operation in the U.S. in 1998. It is estimated that animals are involved in one out of every six injuries on the farm. Animals cause approximately 40% of the injuries to farm children in the hospital. According to an Iowa study, livestock was the leading cause of injuries to children in five of the past seven years. A search of educational information available to secondary schools on livestock safety revealed very few resources, most of which were inadequate in educating students on what is considered normal livestock behavior or how to safely interact with farm animals.

What Has Been Done:
Through a grant from the Southwest Center for Agricultural Health, Injury Prevention and Education, The University of Texas Health Center at Tyler, a fast-paced educational video entitled, "Livestock Safety for Kids", was produced to briefly highlight safety and health precautions associated with livestock. It is designed for elementary students and can be used as a resource prior to taking field trips to petting zoos, fairs and farms. The video uses young people to illustrate the right way to interact with livestock and stay safe. It also stresses good personal hygiene after handling animals and their facilities to prevent the transmission of zoonotic diseases. The target audience is students in grades first through fourth.

Impact:
As the result of a study to determine the impact of this video on knowledge gained, it is estimated that over 10,000 elementary students in Oklahoma have viewed "Livestock Safety for Kids" to date. The total number of students having viewed the video is undoubtedly significantly higher considering the fact that the Oklahoma Veterinary Medical Foundation has distributed this video to all Oklahoma elementary schools in the fall of 2000. In addition, videos have been distributed to all County Cooperative Extension Offices in Oklahoma (77), State 4-H offices in the U.S. plus Puerto Rico and Virgin Island (54), and "Ag in the Classroom" programs across the country (52). Preliminary results of the pre- and post-test survey data of teachers and students who participated in the study indicate the video was well-received and student knowledge level significantly increased. Teachers reported that the video was an excellent tool in preparing their students for animal-related field trips. The impact of this video will be reduced injuries and health problems to Oklahoma's greatest resource – our children.

Funding: Smith-Lever, State

Scope of Impact: State Specific

Contact: Dr. Raymond L. Huhnke, Professor, Biosystems and Agricultural Engineering, Dept. 223 Ag Hall, Oklahoma State University, Stillwater, OK 74078, phone: 405-744-5425, rhuhnke@okstate.edu

Funding Agencies
Southwest Center for Agricultural Health, Injury Prevention and Education, The University of Texas Health Center at Tyler, for video production

Oklahoma Veterinary Medical Foundation for purchase and distribution of videos to all Oklahoma elementary schools

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 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.

District Extension Program Specialists compile priority issues identified by County PACs. The District Specialists summarize the issues within each strategic program priority, and make them available to District Directors and the state office. The issues are also shared at District Advisory Council (DAC) meetings. District Advisory Councils identify needs, problems, and issues that cut across more than one county. District priority issues are reviewed and compiled at the state office. Issues identified most often (either by multiple county PACs or more than one DAC) under each program area are shared with Department heads and state specialists. These needs are given special attention in the development of individual plans of work. They also provide direction for major Extension programs.

Additional meetings of the PACs are also encouraged and conducted throughout the year. Typically these meetings occur after the annual planning process is complete and are used to refine planned county programs and seek additional timely input. These meeting also serve as a time to report accomplishments at the local level.

Another formal means of acquiring stakeholder input comes through the development and revision of the Division of Agriculture and Natural Resources strategic plan. In that process considerable effort is made to acquire input both internal and external to OSU and the extension system. This updating process was completed during the year and each unit within the Division will be expected to create unit action plans during the coming year.

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.

Input collected through the above processes was used to develop county, area, district, and state professionals' plans of work for FY2000 as well as their 4-year plans of work for FY2001-04. Input was also used in the completion of the updated Division of Agriculture's strategic plan.

Input collected at the county and district levels were directly used in development of county and area plans. District input was aggregated as input to state specialist plans of work. In addition, advisory group input was used for key program planning for statewide teams such as mentioned in section A.

C. Program Review Process

No significant changes were made to the program review process stipulated in the Oklahoma five-year plan of work.

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 important 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. 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. Integrated programs also addressed high demand issues of community and economic development.

2). Integrated activities related to alternative crops (vegetables, watermelons, 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 improve effectiveness and efficiency of our efforts.

U.S. Department of Agriculture

Cooperative State Research, Education, and Extension Service

Supplement to the Annual Report of Accomplishments and Results

Multistate Extension Activities and Integrated Activities

(Attach Brief Summaries)

Institution OSU Cooperative Extension Service

State Oklahoma

Check one:

X Multistate Extension Activities

__ Integrated Activities (Hatch Act Funds)

__ Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
Competitive/Sustainable Agricultural Production System	81,443.18				
Healthier, More Well Nourished Population	1,290.91				
Protected & Sustained Environment	32,738.18				
Enhanced Economic Opportunity & Quality of Life	32,738.18				
Total	148,210.45	-	-	-	-

Director

2/28/01
Date

Form CSREES-REPT (2/00)

CSREES Goal 1: Multi-State Activity

Name of Planned Program/Activity: Integrated Resource Management

Brief Progress Report:

- ♣ Developed and conducted Ranch Economics course in-state, developed website for sharing materials with colleagues nationwide
- ♣ Paper at SAEA and WAEA meetings from research on forage/livestock systems , plus participated in symposia on Successful Small Farms at AAEA meetings
- ♣ Poster on Integrated Farm Financial Statements software poster. Program is updated based on user input from multiple states.
- ♣ Cow/Calf Standardized Performance Analysis (SPA) workshop with TAMU and Noble Foundation in Ardmore, April 2000
- ♣ Contributed to multi-state, interdisciplinary IFAFS proposal (not funded)
- ♣ Collaborated on a livestock leasing article with co-authors from NE, KS, MT
- ♣ Led development of interdisciplinary Cow/calf records software workshop for 2001 SAAS meetings
- ♣ Participated in Southern Region IRM committee meeting in December

Contact: Dr. Damona Doye, Ext. Farm Management Specialist

Name of Planned Program/Activity: Southern Extension Farm Management Committee

Brief Progress Report:

- ♣ Participated in annual meeting
- ♣ Led development of interdisciplinary Cow/calf records software workshop for 2001 SAAS meetings
- ♣ Led planning for QuickBooks workshop for 2001 SEFMC meeting
- ♣ Shared new materials developed (e.g. Quicken notebooks and newsletters) on an ongoing basis

Was elected to the AAEA Extension Section board for the Southern Region and have served nine months in that capacity. Chair AAEA Extension Awards subcommittee.

Contact: Dr. Damona Doye, Ext. Farm Management Specialist

Name of Planned Program/Activity: North Central Region Farm Management Committee

Brief Progress Report: In the year 2000, the committee represented by 10 mid-western states and New York, sponsored the Food Animal Production Systems Triennial Extension Workshop at Michigan State University. Annual activities include the development educational material,

regional publications, seminars and workshops for Farm and Agri-business professionals, and individual producers. Committee activities benefit from the support of the Farm Foundation.
Contact Name: Dr. Mike L. Hardin

Name of Planned Program/Activity: National Extension Advisory Committee on Federal Taxation
Brief Progress Report: In the year 2000, the committee cooperated with the Internal Revenue Service to write and distribute the 2000 IRS Publication 225, Farmers Tax Guide that has been distributed to more than 300,000 Ag Producers and tax professionals. Participants from more than 20 states are represented on the committee. Members represent both extension and research appointments in their respective states. These activities are conducted under a Memorandum of Understanding Between USDA and IRS.

The committee meets with IRS in Washington each year in May to jointly write the Farmer's Tax Guide. The agenda also includes presentation from USDA and a meeting with the Joint Committee on Taxation. This important meeting allows our committee to brief the Joint Tax Committee on Ag taxation problems and issues.

Contact Name: Dr. Mike L. Hardin

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

Brief Progress Report: In the year 2000, representatives of more than 20 states cooperated to develop educational material and conduct seminars and workshops for Farm and Agri-business tax professionals. More than 40,000 tax professionals attend sponsored seminars nation wide. The National Farm 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. Materials were used in more than 40 states this year.

Contact Name: Dr. Mike L. Hardin

Name of Planned Program/Activity: Improving and Implementing and Integrated Pest Management Program in Peaches

Brief Progress Report: In 2000, the multi-state peach IPM team has developed the "2000 Southern Peach, Nectarine and Plum Pest Management and Culture Guide." This extension publication is a direct product of these multi-state efforts. It focuses on nearly every aspect of managing insect, disease and weed pests in peaches in the southern region.
In 2000, the multi-state peach IPM teams from Oklahoma and Arkansas have completed the work on two manuscripts for publication in refereed journals. While this work culminates the exhaustive efforts of five years of study on monitoring and trapping plum curculio in peaches and resembles a strong research program, it will have its greatest impact in the extension arena. Results from this work have provided the industry with a new tool for monitoring plum curculio populations (Screen trap) and enhanced capabilities for monitoring this pest in other fruit tree crops throughout the United States. The trap was developed in 1997, in Oklahoma by Dr. Phil

Mulder. It is currently being used throughout much of Michigan in peach and cherry culture to monitor for this important pest. These publications are due for release in 2001 and will provide information on the utility of the traps in a peach IPM monitoring system.

In 2000, the multi-state peach IPM team demonstrated the effects of adopting IPM into a peach system. While experiencing only a 2% reduction in quality over a non-IPM system, growers recognized a $50 - $100 savings in insecticide costs alone. In addition, fewer negative impacts on beneficial organisms, applicators and the environment were experienced. Naturally, this sacrifice in quality will have to be carefully weighted toward the process market and may have less of an impact on fresh market production.

Contact:
Phil Mulder, OSU Extension Entomologist

Name of Planned Program/Activity: Demonstration of a Sustainable Integrated Production System for Native Pecan and Beef Cattle Producers and its Effect on Ecology in Flood Prone Areas

Brief Progress Report: In 2000, the multi-state pecan IPM team, maintained and monitored two sites in flood prone areas of Oklahoma and Arkansas where pecans are grown. These sites were initially established in 1999 and baseline data gathered. Results of early monitoring of pecan weevil populations in 1999 and pecan nut casebearer populations in 2000 were presented to nearly 250 growers at the Annual Oklahoma Pecan Growers Association Field Day. In addition, information of a similar nature is scheduled for delivery to interested growers in Arkansas in April 2001. Data pertaining to several key pecan pests have been gathered and most of that information is ready to be analyzed. We will be gathering another years worth of data in 2001. Unfortunately, the early freezing weather of fall 2000 eliminated yield information for that production year.

Contact:
Phil Mulder, OSU Extension Entomologist

Name of Planned Program/Activity: SERA-IEG-7: Peanut Entomologists Working Group

Brief Progress Report: In 2000, this multi-state working group began the arduous task of assembling a handbook product on peanut pests of the three primary growing regions in the United States. Chapter responsibilities were established and a tentative timeline developed. Drs. Mulder and Herbert will serve as editors of this endeavor. First draft is due at the end of 2001. Information concerning peanut arthropod management across the U.S. was shared among the participants.

Contact:
Phil Mulder, OSU Extension Entomologist

Name of Planned Program/Activity: S-293: Improved Insect and Mite Pest Management Systems

Brief Progress Report: In 2000, this multi-state working group began the task of developing a national publication on the phenology and control of the pecan nut casebearer. Dr. Harris will oversee this task over the next two years. The group also decided to develop and submitted a symposium topic for the National ESA meetings in San Diego, California, A complete agenda with presenters will come from the group and has already been submitted. In addition, the group has agreed to publish a proceedings from this symposium. Dr. Dutcher will moderate the meetings and oversee the production of the proceedings.

Results of evaluations and tests conducted throughout the U.S. were shared among the members present. Cooperative tests between Oklahoma and Kansas will soon be published concerning the development and utility of new trapping technologies for pecan weevil. New cooperative studies between Oklahoma and Louisiana were begun in 2000. These studies focus on the phenology of phylloxera in native and improved cultivars and the use of a degree-day based system for predicting their prevalence in these areas. A second year of these studies is already planned.

Contact:
Phil Mulder, OSU Extension Entomologist

Name of Planned Program/Activity: Greenbug Research Consortium

Brief Progress Report: Meeting was held on September 19-20, 2000. Approximately 35 scientists attended, representing 5 states. Results of research and extension programs related to greenbug management were presented, and a summary of the Greenbug Poster Symposium that was held at the Entomological Society of America meetings in Atlanta GA was distributed to participants.

Contact Name: Tom A. Royer

Name of Planned Program/Activity: Southwest Wheat Research and Education Consortium

Brief Progress Report: Steering Committee Meeting was held August 10, 2000, at the Texas A&M Research and Extension Center, Amarillo. A proposal was submitted to IFAFS for funding. It was not funded, but will be re-submitted April 2001. Planning for the Annual meeting, to be held March 21-23, 2001 were formalized. Minutes of the SWREC meetings have been posted on our website at http://swrec.tamu.edu/.

Contact Name: Tom A. Royer

Name of Planned Program/Activity: SR-IPM Grant, Grazing Winter Wheat for Pest Management

Brief Progress Report: Dr. Emad Ismail was hired to coordinate the project. He has completed the first year of the study and presented results at the Annual Meeting of the Entomological Society of America. Results are promising, and suggest the importance of integrating the effects of grazing in greenbug control measures.

Contact Name: Tom A. Royer

Name of Planned Program/Activity: Regional CAPS Action Team

Brief Progress Report: I reviewed 15 proposals submitted from 8 states for consideration for funding. The Central Region RCAT is being merged with the Western Region. Presently, I will continue as an academic representative.

Contact: Tom A. Royer

Name of Planned Program/Activity: Structural Issues Shaping Modern Agriculture: Southern Extension Public Affairs Committee

Brief Progress Report:
Product results will include:

(1) Symposium (12-13 Jun 00; Williamsburg VA)
(2) Series of papers that are the basis for interdisciplinary, inter-agency educational programs;
(3) Network of professional resources that may be linked through a listserv or website;
(4) Core of acknowledged expertise available for public policy makers;
(5) SEPAC symposium during the joint summer meeting of SEFMC, SEMC & SEPAC;
(6) Proceedings publication distributed at NPPEC 2001 Sep 01;
(7) Target audience for the project includes:
    (a) Public policy educators;
    (b) Public policy decision makers;
    (c) Interested public (agricultural producers, agribusiness managers, etc.)

Contact Name: Larry Sanders

Name of Planned Program/Activity: National Forage Test Association

Brief Progress Report: Served as director of the board and the chairman of Electronic Communication Committee to provide direction on forage quality analysis. Attended all the quarterly board meetings and annual meeting. The association's website was significantly improved during 2000 under my direction. This association has made significant contribution to the American feed and forage industry.

Contact Name: Hailin Zhang

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

Brief Progress Report: Spring dead spot is the most serious disease of turf bermudagrass in Oklahoma as well as in other turf transition zone states. Five multi-year trials screening 80 bermudagrasses for disease resistance remain underway in cooperation with Kansas State University. Disease resistance has also been improved in the products of our bermudagrass breeding and development program.

Proper bermudagrass variety selection for disease resistance as well as integrated management strategies for the disease was transferred to 378 turf industry leaders at a Spring Dead Spot Management Workshop, Annual Turfgrass Field Day and the 55th Annual Oklahoma Turfgrass Conference. All attendees (100%) who completed a Spring Dead Spot Workshop survey following training indicated that they would integrated 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. Arrangements were made to write an article on managing this disease for a spring 2001 issue of Golf Course Management Magazine which is distributed to 20,000 members of the Golf Course Superintendents Association of America.

Contact: Dennis Martin

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

Brief 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 1,335 commercially available and 3,000 experimental turfgrass varieties across 21 species for adaptation to lawn, roadside, parks & grounds, golf course and sod production applications in OK during the last 10 years. Research is on going regarding cultivar testing and proper management. Much of this information is directly useable by the turfgrass professional and homeowner alike.

Over 900 consultations were conducted in 2000 via phone, fax, US mail, email and site visits concerning selection, installation and management of the best adapted turfgrass varieties for any give turfgrass commodity segment. Over 770 individuals received training on proper turfgrass selection and management in 7 workshops and conference conducted in 2000. During new construction and renovation of golf courses and athletic fields, better-adapted turfgrass varieties are being utilized in over 95% of cases in Oklahoma. Fungicide use for dollarspot disease control has been reduced when L-93 creeping bentgrass has been implemented on golf course putting

greens. Some of the highest visibility sites on which we provided consultation and on which improved varieties have been implemented are the: Oklahoma City National Memorial (Cavalier zoysiagrass); the University of Oklahoma Women's' Soccer Complex (Tifsport bermudagrass); Patricia Island Golf Course at Grove, OK (L-93 bentgrass and Midlawn bermudagrass); and Riverview Sod Ranch near Leonard, OK (production of Tifsport bermudagrass) to name just a few sites.

Contact: Dennis Martin

Name of Planned Program/Activity: National Advanced Resource Technology Center - USDA Forest Service, Marana, AZ

Brief Progress Report: Provided a training component in a weeklong prescribed fire-training course for federal natural resource managers to equip them for ecosystem restoration of native plant communities on their respective management units.

Contact: Terry Bidwell

Name of Planned Program/Activity: National Range Judging Contest

Brief Progress Report: With the help of many individuals, provided a forum for high school students to learn about rangeland ecosystems and their management for livestock and wildlife.

Contact: Terry Bidwell

Name of Planned Program/Activity: Sericea Lespedeza Working Group

Brief Progress Report: Coordinated efforts for research and education control and management of sericea lespedeza. Working with Kansas State University to prepare proposals for grant funding for this effort.

Contact: Terry Bidwell

Name of Planned Program/Activity: Reducing Injuries Associated with Animal Handling

Brief progress report: In spring 2000, our video was released entitled “Livestock Safety for Kids”. Copies of the video were distributed as follows:

- All Oklahoma elementary schools through mailings funded by the Oklahoma Veterinary Medical Foundation (1000)
- County Cooperative Extension Offices in Oklahoma (77)
- State 4-H offices in the U.S. plus Puerto Rico and Virgin Island (54)
- State “Ag in the Classroom” programs (52)

To determine video acceptance and increase in student knowledge level, a survey instrument was developed and disseminated to volunteer teachers to be administered to their first through third grade students. Of the approximately 600 teachers who originally agreed to participate, nearly 500 teachers returned a total of over 8700 useable tests. Preliminary results of the pre- and post-test survey data of teachers and students indicate the video was well-received and student knowledge level significantly increased.

Contact Name: Raymond L. Huhnke

Name of Planned Program/Activity: Demonstration of a Sustainable Integrated Production System for Native Pecan and Beef Cattle Producers and its Effect on Ecology in Flood Prone Areas

Brief progress report: A comparison of native pecan and beef cattle double cropping in naturally flood or non flood prone sites with or without legume forage is underway at two locations in Oklahoma and Arkansas. Legume crude protein content was greatest on flood prone sites. Insect population varied with ground cover treatment. Diseases were effectively controlled by use of the Oklahoma pecan scab model. Pecan yield over all treatments and locations ranged from 372 lbs/acre to 1320 lbs/acre. Livestock gain ranged from 5 lbs/acre to 236 lbs/acre.

A pecan production meeting was held for Arkansas pecan producers at Hope, Arkansas, March 10, 2001 with approximately 20 growers in attendance. A field day was held at the demonstration orchard in Okfuskee County, OK in June 2000 with over 300 people in attendance. A feature article on the project was published in Stockman's Grassland Farmer regional magazine in February 2001 and a project update was published in Oklahoma Farmer Stockman magazine in March 2001.

Contact Name:
Dean McCraw, Horticulture and Landscape Architecture Department, Oklahoma State University, 405-744-5409. E-mail: dmccraw@okstate.edu

Cooperators:
Gerrit W. Cuperus, State Extension IPM Coordinator, OSU, 405-744-9419
David Lalman, Extension Beef Cattle Specialist, OSU, 405-744-6060
Phillip Mulder, Extension Entomologist, OSU, 405-744-9413
Joe Schatzer, Professor of Agriculture Economics, OSU, 405-744-6161
Michael W. Smith, Regents Professor, Pomologist, OSU, 405-744-5414
James Stiegler, Extension Soils Specialist, OSU, 405-744-9620
Keith Striegler, Extension Horticulturist, Univ. of AR, 501-575-2603
John Turner, County Extension Agriculture Agent, Miller County, AR, 870-779-3609
Ron Vick, County Extension Educator, OSU, Okfuskee County, OK, 918-623-0641
Sharon L. von Broembsen, Extension Plant Pathologist, OSU, 405-744-9960

CSREES Goal 3: Multi-State Activity

Name of Planned Program/Activity: National Nutrition, Food Safety, and Health Specialists Conference

Brief Progress Report: This conference will strategize around critical and emerging issues in nutrition, food safety, and health; address accountability issues at the national level, explore ways to integrate extension and research programming; and work on multi-state projects, and access integrated resources.

Contact Name: Janice Hermann

CSREES Goal 4: Multi-State Activity

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

Brief progress report: Due to changes in funding, the conference, originally planned for this spring, was postponed and is now planned for fall 2001. To date participation has been in one conference call and have provided other feedback. Presently plans are to meet with Southern Region Water Quality Coordinators to begin planning the conference. Will chair the youth and volunteer program track.

Contact Name: Billie Chambers

Name of Planned Program/Activity: 4-H Wonderwise (Multi-state project with Nebraska. Nebraska controls funding)

Brief progress report: Participated in 2 two-day planning meetings in Lincoln, NE to evaluate the Wonderwise materials previously developed for schools, advise the curriculum team on what kinds of changes would be needed in similar materials developed for volunteer-led 4-H clubs and identify topics, etc. for materials to be developed for 4-H.

Currently coordinating a pilot test of the existing materials with 4-H audiences in 8 locations in Oklahoma and have devoted time to identifying appropriate pilot locations, explaining the program and pilot-test procedure, and following up on the first evaluation forms.

Contact Name: Billie Chambers

Name of Planned Program/Activity: Fumigation Programs

Brief Progress Report: OSU's Pesticide Applicator Education (PAE) program has worked with Arkansas, Louisiana, Mississippi, Missouri and Texas along with OSU's Stored Product IPM team to provide pesticide education programs on stored product fumigation. These efforts

include working with Arkansas, Louisiana and Mississippi in providing education opportunities for the three states at Vicksburg, MS. We have worked with the Texas A&M Extension service and the High Plains PS chapter to provide fumigation programs in Amarillo, TX and with Great Plains Chemical to assist in education efforts to its customers in Lubbock, TX. For the past three years, we have assisted the University of Missouri in presenting initial and recertification fumigation programs in Columbia, MO to their certified people. We have presented education programs at the Minnesota Stored Grain Pest Management Conference.

Over 500 fumigators were in attendance at these programs. They received updated information on the registration status of aluminum and magnesium phosphide, Reldan and Actellic pesticides. They also received up-to-date information on potential regulatory changes and safe use practices for these pesticides along with new information on grain storage practices for proper pest and grain management.

Contact Person: Jim T Criswell

Name of Planned Program/Activity: Ornamental & Turf

Brief Progress Report: The OSU Pesticide Applicator Education (PAE) program in conjunction with the Urban IPM team developed the Ornamental and the Turf IPM manuals. These manuals comprise the material for certification in Ornamental & Turf in Oklahoma. PAE shared these with the other states and territories. This has resulted in other states utilizing one or more of the manuals for their certification programs. States utilizing these manuals include Virginia, Kansas, Texas and others.

These applicators received print material explaining both ornamental and turf management practices for both pest and plants.

Contact Person: Jim T Criswell

Name of Planned Program/Activity: Pest Control

Brief Progress Report: I have served on the Association of Structural Pest Control Officials Service Technician committee. This committee's charge was to develop training material for pest control company employees. We presented an education program involving pesticide safety and the registration status of major pesticides used in food processing at the Minnesota Food Processing Plant Management Conference.

The committee has developed the material and made it available to pest control companies nationally and in the state.

Contact Person: Jim T Criswell

Name of Planned Program/Activity: Pesticide Use on Peanuts in Texas and Oklahoma

Brief Progress Report: A cooperative program with Texas A&M surveyed peanut growers in both states on pesticide use and production practices. This program was a cooperative effort with OSU peanut research and extension personnel and with Drs. Dudley Smith and Rodney Holloway at Texas A&M.

Results from this effort, has allowed a better focus on research and extension programs in both states to address grower problems. Information from this work has also allowed Texas and Oklahoma to address regulatory issues stemming from the Food Quality Protection Act.

Contact Person: Jim T Criswell

Name of Planned Program/Activity: Field Bindweed Mite Project:

Brief Progress Report: A proposal for the field bindweed mite project was submitted for funding through the Southern Region IPM program. It was not approved for funding. Andy Hollan, graduate student with Dr. Thomas Peeper, is finishing his project and will graduate this summer/fall. The mite has been established in a nursery located in Guymon, OK and will serve as a source of mites for further distribution. Mites were distributed to over 100 producers at the Lahoma Research Station Field Day in May 2000. Plans are to continue with establishment efforts through cooperative activities with county Extension Educators, Agriculture.

Contact Name: Tom A. Royer

Name of Planned Program/Activity: SERA-IEG-6 Soil, Plant, Water, and Waste Analysis

Brief 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. In September 2000, SERA-6, NRC-13 and NEC-67 had a Joint Annual Meeting in Omaha, NB to coordinate among regional groups. I presented a talk titled "*Standardizing water soluble phosphorus method"*. Water soluble phosphorus is an important indicator of potential P runoff from agricultural fields, but no standardized method is existing. The proposed procedure was well received by more than 60 attendees.

Contact Name: Hailin Zhang

Name of Planned Program/Activity: SERA-IEG-17 Minimizing Phosphorus Losses from Agriculture

Brief Progress Report: The purposes of this committee are to develop best management practices (BMPs) to reduce agricultural P losses to surface waters by erosion and runoff (surface and subsurface), and to develop upper, environmentally-based, critical limits for soil test P and new soil testing methods that can more accurately identify sites where P loss will be of significant environmental concern. Attended its annual meeting in Madison, WI in July 2000 to coordinate on going activities. This group published a bulletin titled "Methods of Phosphorus Analysis". I contributed a chapter on "Phosphorus Fractionation". A very active listserve is also maintained by this group to foster communication among all interested people.

Contact Name: Hailin Zhang

Name of Planned Program/Activity: National Center for Manure and Animal Waste Management

Brief Progress Report: Oklahoma State University is a member of all four animal waste management related multi-state programs. Involved in most of the planned activities representing OSU. Work with several scientists from other member institutions to prepare a white paper on soil remediation, and to develop a waste operators certification program. Several meetings were held in 2000 to identify priorities and set directions.

Contact Name: Hailin Zhang

Name of Planned Program/Activity: Testing and Advising on The Use of Electrochemical Water Conditioning Devices for Improving Turfgrass Irrigation Water Quality

Brief Progress Report: Several electrochemical and/or electromagnetic water conditioning devices have entered the market place in recent years. Several of the companies marketing these devices claim that the conditioning effect upon irrigation water reduces the detrimental effects of deficit irrigation, high levels of sodium or total soluble salts in irrigation water as well as improves water use efficiency.

Due to the growing national crisis regarding irrigation water availability and quality, a cooperative research project between the USGA Greens Section Agronomist (Dallas, TX) and our turfgrass program was undertaken in 2000. In our two research experiments conducted to date at Stillwater, OK, the particular device that was tested failed to deliver improvements in water use efficiency, turfgrass visual quality or clipping dry matter yield under conditions of deficit irrigation on Tifway bermudagrass.

At the December 2000 Annual Texas Turfgrass Conference and Trade Show in San Antonio, thirty-two turfgrass industry leaders were presented with information that the electrochemical water conditioning device which we tested had no beneficial effects on classical irrigation water properties nor on turfgrass tolerance to deficit irrigation. We urged potential purchasers of water conditioning units to demand research-based information from sales representatives before making a purchase of a product as well as to demand a written guarantee of product performance so that funds spent on water conditioning devices are not wasted or diverted from more

appropriate applications. National distribution of our findings and suggestions are planned in 2001.

Contact: Dennis Martin

Name of Planned Program/Activity: Restoration of Lesser Prairie Chicken
Brief Progress Report: Provided the latest research information generated by OSU to state and federal agency personnel and the multi-state working group. Provided technical assistance to agency personnel and landowner awareness on lesser prairie chicken habitat restoration.

Contact: Terry Bidwell

Name of Planned Program/Activity: Black-tailed Prairie Dog State Working Group

Brief Progress Report: Provided technical input for the management plan to improve the status of the black-tailed prairie dog and thus preventing it from being listed as a threatened or endangered species. Presented technical information at landowner meetings.

Contact: Terry Bidwell

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

Brief Progress Report: The Southern Region Committee met twice during 2000. In the spring meeting we planned a Regional 406 Coordinating project for submittal to CSREES. In the fall we started planning the next Southern Region Water Quality/Waste Management Workshop, to be held in October 2001. The Southern Region 406 proposal was successful, securing approximately $1.2M for the Southern Region with about $118,000 for Oklahoma.

We brought Bruce Lesikar from Texas A&M University to Stillwater and Hobart, Oklahoma in May 2000 to speak to Extension Specialists and Agents and cooperators from the Department of Environmental Quality on wetlands treatment of municipal sewage. The visit included a field trip to Hobart and consultation with City of Hobart on their treatment system problems.

Contact Name: Michael D. Smolen

Name of Planned Program/Activity: National Advisory/Leadership Team for Water Quality

Brief progress report: The National Advisory/Leadership Team (NA/LT) met repeatedly with the CSREES National Program Leader for Water Quality and maintained a communication link with the Water Quality Coordinators through email and listserves. During March 2000 the NA/LT presented concerns of the Coordinators to key Congressional Delegations and to the Administrator of CSREES.

During summer 2000, NA/LT petitioned ECOP to become a formal leadership team for the Water Quality Base Program. NA/LT was referred to the National Program Leadership Committee (PLC). In fall 2000 the PLC gained approval from ECOP to make NA/LT the Water Quality Leadership Team under PLC. Prior to the end of 2000, the Water Quality Leadership Team started planning a National Water Quality Coordinators Conference for San Antonio in March 2001.

Contact Name: Michael D. Smolen

Name of Planned Program/Activity: 4-H Wildlife Habitat Evaluation Program (WHEP) (national Program with involvement of 28 states)

Brief Progress Report: The National Invitational Competition will be held in Alta, Wyoming on July 29-August 2, 2001. A proposal has been received and accepted for the 2002 event to be held in Ohio. The recently completed national manual was updated and printed in January 2000 and has been reprinted four times. A CD has been developed with the National Manual on it and included several training powerpoint presentations. It was updated in February 2001 with the additional of 13 additional powerpoint presentations for use as training aids.

Contact Name: Ron Masters, WHEP National Program Chair

CSREES Goal 5: Multi-State Activity

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

Brief Progress Report: The team is now completing data gathering and cleaning from its third survey. This survey has re-interviewed the national sample of family businesses studied during 1997. Some early data will be available in Jan. 2001. The working group that is trying to define an economically community is continuing its efforts.

Contact: Glenn Muske, Assistant Professor, Ext. Home-Based & Micro-Business Specialist

Name of Planned Program/Activity: Home-Based Businesses: The Implications for the Rural Economy of the South

Brief Progress Report: The manuscript has been written and is currently being edited by the Southern Rural Development Center. Anticipated publication date is Feb. 2001.

Contact: Glenn Muske, Assistant Professor, Ext. Home-Based & Micro-Business Specialist

Name of Planned Program/Activity: Southern Rural Development Center's E-Commerce Taskforce

Brief Progress Report: Task force met to discuss e-commerce in the South. Teams of researchers and those interested in curriculum development discussed future work. Several members were selected to attend the national e-commerce task force. Plans are to meet again as a part of an Information Exchange Group (IEG-16) at the January Southern Ag Scientists convention.

Contact: Glenn Muske, Assistant Professor, Ext. Home-Based & Micro-Business Specialist

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

Brief Progress Report: This web site continues to be updated and used for in-service and general public training. An article regarding the development and initial impact about the site has been written and submitted to the Journal of Extension.

Contact: Glenn Muske, Assistant Professor, Ext. Home-Based & Micro-Business Specialist

Name of Planned Program/Activity: Kansas City Global 4-H Conference

Brief Progress Report: This event was once planned and conducted by the Kansas City Chamber of Commerce. Over time the event declined and was near the point of being cancelled. A team of faculty and staff was identified with multi-state representation whose charge was to strengthen the education content of the event. The three-day event now features tours, workshops, service learning, and cultural events that prepare youth for future career opportunities.

Contact: Tracy Branch

Name of Planned Program/Activity: National 4-H Youth Congress

Brief Progress Report: Through a rotational system all of the states have an opportunity to provide leadership to the planning, implementation and evaluation of this national event. During the past year, I served on the headquarters committee, helping to facilitate the smooth operations of the conference. In 2001 I am the committee chair. As a chair, I have been involved in the planning of the conference along with other staff and youth from other states. The conference in 2001 will focus on Agricultural Science.

Contact: Charles Cox

Name of Planned Program/Activity: Scientific Focus in 4-H

Brief Progress Report: A team of county and state staff for Oklahoma and Arkansas has been identified to work on the expansion of science and technology projects for youth in these two

states. The team will meet face to face in April for a two-day brainstorming, planning and goal setting session. The hope is to expand the kind of experiences that 4-H members can obtain through 4-H that relate to expanded areas of science and technology. A technology task force has been meeting for over a year in Oklahoma and will soon be implementing a youth tech core that will primarily work to expand technology literacy among both youth and adult audiences.

Contact: Charles Cox & Pat Thompson

Name of Planned Program/Activity: Wonder Wise

Brief Progress Report: This program was originally designed for use in classrooms to help expand student interest in science. A major portion of the curriculum is committed to showing the role of women in science. Currently a design team is working to convert the curriculum to a format that your would be more useful in a 4-H club setting. In addition to meeting to evaluate current materials, scope and sequence planning has taken place to direct future development. Training will be conducted in the coming year for Oklahoma staff, which will include staff from Nebraska, the lead state in the project.

Contact: Billie Chambers

Name of Planned Program/Activity: SERA-IEG 16 Rural Infrastructure

Brief Progress Report: This regional information and research exchange met at Kentucky prior to the SAAS meetings. Attendance was low due to a snow storm and travel difficulties. Plans were made to focus on e-commerce for the following year.

Contact Name: Mike Woods

Name of Planned Program/Activity: Community Development Institute

Brief Progress Report: This Institute is sponsored by the Southern Rural Development Center and provides training to extension staff in the Southern region. About 30 staff from Southern states participated in the week long training session in May, 2000 held in North Carolina. I was one of the faculty for the Institute.

Contact Name: Mike Woods

Name of Planned Program/Activity: Community Policy Analysis Network (CPAN)

Brief Progress Report: On the leadership team of CPAN, which includes professionals from Missouri, Wisconsin, Iowa, Nevada, Oklahoma, and Nebraska. The network has designed a policy analysis model, put community tools on the website, and hosts an annual meeting. The complete network involves professionals from most states.

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

Name of Planned Program: Operation Rural Health Works (Grant)

Brief Progress Report: The program began in 1999 when I chaired a team of professionals in five states (Oklahoma, Missouri, Kentucky, Nevada, Pennsylvania) that devised a tool to measure the economic impact of the health sector on a local economy. In 2000 we received a grant to conduct Train-the-Trainer workshops in other states. We conducted workshops in 20 states during 2000. So far we have conducted workshops in 5 states for the 2001- year.

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

Name of Planned Program: Healthy People/Healthy Community.

Brief Progress Report: The committee, consisting of professionals from North Carolina, Ohio, Illinois, Alabama, Oklahoma, Texas, Florida, and Washington, DC, is initiating health activities through the extension services across the nation. This includes a joint education program with pharmacists, developing health education tools, and co-sponsoring a national health conference.

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

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multistate Extension Activities and Integrated Activities
(Attach Brief Summaries)

Institution OSU Cooperative Extension Service
State Oklahoma

Check one:
__ Multistate Extension Activities
__ Integrated Activities (Hatch Act Funds)
X Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
Competitive/Sustainable Agricultural Production System	421,568.35				
Healthier, More Well Nourished Population	28,018.95				
Protected & Sustained Environment	26,771.31				
Enhanced Economic Opportunity & Quality of Life	60,756.96				
Total	537,115.57	-	-	-	-

Director

2/28/01
Date

Form CSREES-REPT (2/00)

CSREES Goal 1: Integrated Activities

Name of Planned Program/Activity: Effects of Nutrition, Management and Medical Treatment on the Health and Performance of Newly Arrived Stressed Stocker Cattle.

Brief Progress Report: Over the past few years, a series of management recommendations for the handling of stressed cattle have evolved from our research. These are summarized in OSU Fact Sheets 9102 and 9103, and in OSU RP-9104. These procedures have proved to be successful. However, continual changes in management and treatment procedures used on cattle prior to shipment to Oklahoma make it necessary to continue to monitor responses to dietary and medical treatments to adjust for previous nutritional treatments and for resistance to drugs. Procedures to quickly identify sick animals are needed. If sickness is detected early, treatment is usually successful. Delay in the detection of illness reduces the chance of recovering both productivity and health. Additional research is needed to develop practical methods for early detection of sickness in cattle under field conditions.

The latest research and extension information has been presented at Field Days at the Willard Sparks Beef Research Center, at The Oklahoma Wheat Pasture Conference and at the semi annual Backgrounding and Receiving Lot Conference. In addition this information was presented at national scientific meetings in animal science and veterinary medicine. Our extension staff and Veterinarians conducted dozens of county and area meetings. Most recently this information was presented In February 1,2001 at the National Cattlemens Business Association annual meeting in San Antonio.

Within Oklahoma and adjacent states most cattlemen follow the recommendations coming from OSU research on handling shipping stressed cattle. Most recently the national beef quality audit shows a dramatic reduction in losses due to improper injection sites.

Contact: Don Gill

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 are evaluated in research plats at the OSU Southwest Research and Extension Center. 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.

Contact Name: Dr. J. C. Banks

Name of Planned Program/Activity: Promotion of the Use of Improved Alfalfa Varieties

Brief progress report: As part of the alfalfa breeding program, an extensive variety testing program is conducted throughout the state. Test results are published on the Internet at www.agr.okstate.edu/alfalfa/var-test/alf-var.html The best varieties for Oklahoma in these tests are promoted in articles in the Oklahoma Alfalfa Hay & Seed Association NEWS and in oral

presentations organized by County Extension Educators. This activity is responsible for the high level of acceptance of improved alfalfa varieties in the state.

Contact Name: John Caddel

Name of Planned Program/Activity: Promotion of Forage Legumes in Oklahoma Pastures

Brief progress report: As part of our pasture management and legume breeding programs, we plant trials and demonstrations of forage legumes adapted to Oklahoma. The best species are promoted as part of tours and demonstrations at research stations and in commercial pastures. The plantings also serve as a source of material for images on our Oklahoma Forages web page at www.agr.okstate.edu/forage/ This activity assists County Extension Educators and Area Extension Specialists promote improved pasture management.

Contact Name: John Caddel

Name of Planned Program/Activity: Peaches - Meteorology of Peach Orchards and Spring Freeze Protection

Brief Progress Report: This is a project to compare in-orchard weather conditions with those from nearby Oklahoma Mesonet towers. Automated weather stations were installed in 5 peach orchards across the state in late 1999. Comparison of in-orchard weather conditions with Mesonet tower data during winter/spring 2000 showed good agreement. Four experiments with a portable wind machine during March/April showed good potential for protecting orchards against damaging spring freezes. This research was discussed and demonstrated during a field day for peach growers in Porter last June. We'll continue to get the information out to peach growers as more becomes available. The goal is to allow the Mesonet to become an operational tool for peach growers, especially during spring freeze conditions, and also to demonstrate some freeze protection measures.

Contact Name: Dr. J. D. Carlson

Name of Planned Program/Activity: Dissemination of Management Tools for Agriculture and Natural Resources over the World Wide Web

Brief 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 World Wide Web (with the help of computer personnel at the Oklahoma Climatological Survey in Norman). These products consist of various useful maps of data derived from the Oklahoma Mesonet and various models which have as their input Mesonet data. Our AgWeather home page is located at http://agweather.mesonet.ou.edu . Specifically, models exist for fire danger, atmospheric dispersion, evapotranspiration, insect pests (alfalfa weevil, pecan nut casebearer), and disease pests (pecan scab, peanut leafspot, watermelon anthracnose). These models are periodically discussed in various grower meetings and publications. In the spring of 2001, a series of regional extension workshops are planned to discuss these and other

web pages; a nice product notebook will be provided to participants. We also hope to include personnel from NRCS, FSA, and ODA.

Contact Name: Dr. J. D. Carlson

Name of Planned Program/Activity: Benefits of Fungicidal Control of Watermelon Anthracnose

Brief Progress Report: Watermelon represents of the most important vegetable crops in Oklahoma. The foliar disease anthracnose represents one of the most important constraints on the productivity of watermelon crops in the state. The disease can be effectively controlled by the application of fungicide. However, the economic benefits of control under conditions found in Oklahoma remain unclear to many of the state's vegetable farmers. Relationships among the productivity of a watermelon crop, the intensity of disease, and the frequency and cost of fungicide application are not well understood. Research was conducted to critically evaluate these relationships. Depending on environmental conditions, the net benefit of disease control varied from $0.00 to $40.00 per dollar spent on fungicide application. Results of this research have been transferred via on site demonstrations, mailings, annual research reports, and in oral presentations at meetings of vegetable producers.

Name of contact: Jim Duthie, Department of Entomology and Plant Pathology

Name of Planned Program/Activity: Scheduling Applications of Fungicide for the Control of Watermelon Anthracnose

Brief Progress Report: In Oklahoma, the foliar disease anthracnose can cause almost complete loss of a watermelon crop. Under most conditions, the disease can be controlled effectively by the application of fungicides. However, the occurrence of the disease is sporadic. Weather has a large effect on the development of epidemics. Consequently, the disease is controlled most effectively but at minimal cost to the producer, by applying fungicide when the disease is most likely to occur. Research was conducted to evaluate the effectiveness of various methods of scheduling application of fungicide. Applications could be minimized while effectively controlling the disease by using a schedule based on site-specific measurements of relative humidity and temperature that are reported by the Oklahoma Mesonet. Information on the likelihood of outbreaks of anthracnose and on appropriate fungicide application schedules currently are made available to watermelon farmers statewide via the internet. Methods of applying this information to specific watermelon crops has been described in on field demonstrations, mailings, annual research reports, and in oral presentations at meetings of vegetable producers.

Name of contact: Jim Duthie, Department of Entomology and Plant Pathology

Name of Planned Program/Activity: Integrated Management of Peanut Diseases

Brief Progress Report: Field research trials were completed in 2000 that management of Sclerotinia blight of peanut. Biological, chemical, and cultural management strategies were evaluated. The cultivars Tamspan 90, Tamrun 98, and Tamrun 96 have been identified as moderately resistant to Sclerotinia blight. Despite the improved performance of these varieties in infested fields, yields of all varieties were increased by the experimental fungicide fluazinam. Therefore, the effects of deploying the resistant cultivars and using an effective fungicide are additive. Results were transferred to clientele through extension publications, popular articles, and mass media. Greater than 90% of the peanut acreage infested with Sclerotinia blight was planted with a moderately resistant variety in 2000. In addition, data from the applied research was used to support an emergency exemption request for use of fluazinam on peanuts was approved for the first time 2000.

Name of Contact: John Damicone

Name of Planned Program/Activity: Integrated Management of Commercial Vegetable Crop Diseases

Brief Progress Report: Research under controlled conditions was completed to quantify the temperature and wetness requirements for infection of spinach and development of white rust. The data was used as a template for the development and validation of a weather-based spray advisory for increasing the efficiency of fungicide programs on spinach. Field demonstration trials are being conducted in commercial fields to introduce the program to growers and food processors.

Name of Contact: John Damicone

Name of Planned Program/Activity: Managing Arthropod Pests on Vegetable Crops in the South Central U.S.

Brief Progress Report:

1. Evaluate alternative insecticides for use in IPM programs on watermelon and leafy greens crops and develop databases sufficient to serve as support for registration and use on the crops.

Integration with extension: During FY2000 we conducted 12 insecticide evaluation trials, primarily in small plots at the WWAREC but also in cooperation with producers. Results from seven projects were published in Arthropod Management Tests. Results were summarized for producers and presented at state and regional producer meetings as written technical reports. The reports were also circulated nation wide to supporting ag industry leaders and representatives. Results were used to support recommendations made to IR4 during the annual prioritization conference and will be used to support Section 18 and 24c labeling for Oklahoma producers.

2. Develop alternative management methods to replace the use of insecticides in watermelon and leafy greens crop production.

Integration with extension: Cooperative projects were conducted with the Southeast Area Horticultural specialist to evaluate effectiveness of a trap crop management system for early season pests on watermelon. This project is funded partially through the USDA/CSREES Pest Management Alternatives Program.

3. Determine action thresholds for insect pests on processing greens crops destined for varying markets.

Integration with extension: This project is primarily in conduct as a research program.

4. Develop insecticide application systems that can make effective use of botanical derived insecticides for control of insects on watermelon and leafy greens.

Integration with extension: A manuscript has been submitted and recommendations will be provided to industry leaders through the annual HIS meeting and to Oklahoma Vegetable Association through its semi-annual meetings.

5. Determine dose response relations for botanical insecticides.

Integration with extension: This is primarily a research project leading to publication in technical journals.

Contact Name: Jonathan Edelson

Name of Planned Program/Activity: Livestock Safety for Kids

Brief Progress Report: In spring 2000, we released our video entitled "Livestock Safety for Kids". To determine video acceptance and increase in student knowledge level; a survey instrument was developed and disseminated to volunteer teachers to be administered to their first through third grade students. Of the approximately 600 teachers who originally agreed to participate, nearly 500 teachers returned a total of over 8700 useable tests. Preliminary results of the pre- and post-test survey data of teachers and students indicate the video was well-received and student knowledge level significantly increased.

Contact Name: Raymond L. Huhnke

Name of Planned Program/Activity: Cooling Systems for Livestock and Poultry

Brief Progress Report: Using the past seven summers of hourly Mesonet weather data, a Poisson loglinear regression model is being developed to predict the average number of hours per year and the rate at which an evaporative cooler could reduce the Temperature-Humidity Index (THI) to below 79 for various locations throughout Oklahoma. It is anticipated that this research will be completed by May 2001. Results of this study will be used to educate livestock and poultry producers throughout Oklahoma on the effectiveness of evaporative cooling in reducing heat stress on animals. Producers can then determine if there is an economical payback to include evaporative cooling in their facilities.

Contact Name: Raymond L. Huhnke

Name of Planned Program/Activity: Efficacy of Chemical Seed Treatments to Control Wheat Root Rots

Brief Progress Report: Replicated seed treatment trials were planted during fall, 2000, at three locations in Oklahoma (Stillwater, Haskell, and Burlington) to evaluate the value of chemical seed treatments on emergence of wheat, control of wheat root rots, and yield by hard red winter wheat. Results indicated improved emergence (as indicated by stand counts) at one location (Burlington). Disease control and effect on yield will be determined in 2001.

Contact Name: Dr. Robert M. Hunger, Entomology & Plant Pathology

Name of Planned Program/Activity: Efficacy of the Seed Treatment Gaucho (Imidacloprid) in Controlling Aphids and Barley Yellow Dwarf Virus

Brief Progress Report: Replicated field plots at two locations in Oklahoma (Stillwater and Chickasha) indicated increasing control of aphids as rate increased from 0.0 to 3.0 oz/cwt, with highly effective aphid control achieved at rates $\geq$ 2.0 oz/cwt.

Contact Name: Dr. Robert M. Hunger, Entomology & Plant Pathology

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

Brief Progress Report: In the first two years of the study precipitation for April – August has been below the long-term mean. Therefore alternatives to the Wheat-sorghum-wheat rotation have been unsuccessful.

Contact: Rick Kochenower

Name of Planned Program/Activity: Oklahoma Grain Sorghum Performance Trials

Brief Progress Report: Trials were planted at six locations with seven trials and reported in PT 2000-26. Extension plot tours and meetings were held at 6 locations with 150 producers attending.

Contact: Rick Kochenower

Name of Planned Program/Activity: Oklahoma Panhandle Corn Trial

Brief Progress Report: An irrigated trial was planted at the Oklahoma Panhandle Research and Extension Center. Results of ensilage and grain yield were reported in PT 2000-25.

Contact: Rick Kochenower

Name of Planned Program/Activity: Panhandle Wheat Variety Trials

Brief Progress Report: Four trials were planted at three locations in the panhandle. Results are reported in PT 2000-22. Extension plot tours were held at two locations attended by 40 producers.

Contact: Rick Kochenower

Name of Planned Program/Activity: Sunflower Performance Trials

Brief Progress Report: Dry land and irrigated Sunflower Performance Trials were planted at the Oklahoma Panhandle Research and Extension Center. Results are reported in PT 2001-2.

Contact: Rick Kochenower

Name of Planned Program/Activity: First Annual Panhandle Crop Production Clinic

Brief Progress Report: On March 2, 2000 Crop production clinic was held at the Oklahoma Panhandle Research and Extension Center. Invited speakers gave presentations on Corn and Soybean production in the panhandle region. Thirty-three producers, agriculture business personnel, and extension agriculture educators attended the clinic.

Contact: Rick Kochenower

Name of Planned Program/Activity: Oklahoma Panhandle Research and Extension Center Research Highlights

Brief Progress Report: One hundred and fifty copies were published and thirty-three copies were received by people attending the Crop Production Clinic. Another 100 were requested during the rest of the year.

Contact: Rick Kochenower

Name of Planned Program/Activity: Use of Byproduct Feeds to Replace High Quality Forage

Brief Progress Report: Data was generated from OAES resources (cattle, etc.) and funding (TRIP program) evaluating systems to utilize soybean hulls as a replacement for high quality forage during times when high quality forage was not available due to season of the year or drought. A series of educational meetings (24 in all) were conducted to disseminate the data and resulting recommendations. Additionally a powerpoint presentation was developed and distributed to extension staff, along with a white paper manuscript describing results of the projects and our latest recommendations. An OCES fact sheet is being developed and a survey is currently being conducted to quantify the impact of the program.

Contact Name: David Lalman

Name of Planned Program/Activity: Stockpiling Bermudagrass to Reduce Hay Feeding

Brief Progress Report: A review article was written by an interdisciplinary team of OSU faculty and has been published in a major peer reviewed journal (Journal of Animal Science). A second peer reviewed manuscript is in press. Our data indicates that this grazing management technique can reduce cow wintering costs by $15 to $30 per head compared to more traditional systems. Data generated in this research effort has been disseminated through educational meetings, extension fact sheets and conference proceeding. In addition, an in-service training session was held, a powerpoint presentation was developed and disseminated (complete with suggested text and fact sheet draft) to extension faculty. The extension fact sheet is in the final stages of development.

Contact Name: David Lalman

Name of Planned Program/Activity: Pecan and Beef Cattle Production Systems.

Brief Progress Report: The project includes demonstration/research plots in Okfuskee County, OK and Miller County, AR. It demonstrates a native pecan, beef cattle double crop system using legumes as an orchard floor cover and livestock forage. The SARE funded project title is "Demonstration of a Sustainable Integrated Production System for Native Pecan and Beef Cattle Producers and its Effect on Ecology in Flood Prone Areas".

Data was collected on forage quality and quantity, pecan yield and quality and beef production under flood and non-flood conditions. A field day/tour with over 300 persons in attendance was held at the Okfuskee County site in June 2000 in connection with the annual meeting of The Oklahoma Pecan Grower's Association. All plots were observed on the tour and presentations made for all in attendance.
A summary report of the project's first year results was published in the January 2001 issue of "Stockman's Grassland Farmer" regional magazine.

Contact Name: Dean McCraw, Extension Horticulture, OSU, 405-744-5409

Cooperators: Phil Mulder, Extension Entomology, OSU
Sharon von Broembsen, Extension Plant Pathology, OSU
David Lalman, Extension Animal Science, OSU
Becky Carroll, Extension Horticulture, OSU

Name of Planned Program/Activity: Peach Orchard Management Systems.

Brief Progress Report: The project emphasis is on effectiveness of peach management programs with and without organophosphate (OP) insecticides. Second year data was collected on peach fruit yield and quality under OP and non-OP based integrated pest management systems. Data indicate that pest management systems are less effective without OP insecticides. Oral presentation of results was made at Oklahoma Horticulture Industries Show, Tulsa, OK in January 2000; Southern Region American Society for Horticultural Science, Lexington, KY, Jan 2000 and at Southeast Professional Fruit Workers meeting, McMinville, Tennessee, September 2000. One graduate student, Brian Jervis, will complete MS degree in Horticulture on this project in May 2001.

Contact Name: Dean McCraw, Extension Horticulture, OSU, 405-744-5409

Cooperators: Phil Mulder, Extension Entomology, OSU
Ken Jackson, Extension Plant Pathology, OSU
Becky Carroll, Extension Horticulture, OSU

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

Brief Progress Report: Spring dead spot is the most serious disease of turf bermudagrass in Oklahoma as well as in other turf transition zone states. Five multi-year trials screening 80 bermudagrasses for disease resistance remain underway in cooperation with Kansas State University. Disease resistance has also been improved in the products of our bermudagrass breeding and development program.

Proper bermudagrass variety selection for disease resistance as well as integrated management strategies for the disease was transferred to 378 turf industry leaders at a Spring Dead Spot Management Workshop, Annual Turfgrass Field Day and the 55th Annual Oklahoma Turfgrass Conference. All attendees (100%) who completed a Spring Dead Spot Workshop survey

following training indicated that they would integrated 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. Arrangements were made to write an article on managing this disease for a spring 2001 issue of Golf Course Management Magazine which is distributed to 20,000 members of the Golf Course Superintendents Association of America.

Contact: Dennis Martin

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

Brief 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 1,335 commercially available and 3,000 experimental turfgrass varieties across 21 species for adaptation to lawn, roadside, parks & grounds, golf course and sod production applications in OK during the last 10 years. Research is on going regarding cultivar testing and proper management. Much of this information is directly useable by the turfgrass professional and homeowner alike.

Over 900 consultations were conducted in 2000 via phone, fax, US mail, email and site visits concerning selection, installation and management of the best adapted turfgrass varieties for any give turfgrass commodity segment. Over 770 individuals received training on proper turfgrass selection and management in 7 workshops and conference conducted in 2000. During new construction and renovation of golf courses and athletic fields, better-adapted turfgrass varieties are being utilized in over 95% of cases in Oklahoma. Fungicide use for dollarspot disease control has been reduced when L-93 creeping bentgrass has been implemented on golf course putting greens. Some of the highest visibility sites on which we provided consultation and on which improved varieties have been implemented are the: Oklahoma City National Memorial (Cavalier zoysiagrass); the University of Oklahoma Women's' Soccer Complex (Tifsport bermudagrass); Patricia Island Golf Course at Grove, OK (L-93 bentgrass and Midlawn bermudagrass); and Riverview Sod Ranch near Leonard, OK (production of Tifsport bermudagrass) to name just a few sites.

Contact: Dennis Martin

Name of Planned Program/Activity: Integrated Watermelon Production Practices Survey

Brief Progress Report: An on-farm research survey was undertaken for two years to determine the management systems and components of these management systems that are in place with Oklahoma watermelon producers, and the relationship between selected production factors and crop yield. Surveys were conducted in 106 fields throughout the state on a weekly basis, involving over 1600 hectares of production. Data were collected concerning numerous cultural practices, biotic and abiotic factors, costs associated with each factor, yield, profit, and

relationships among cultural practices and profits. Data were collected in such a way that analyses would allow the authors to categorize and classify production systems according to their level of management intensity. Classifications of the levels of intensity are being used to determine the relative levels of risk, and the opportunities for profit with different management systems.

At the same time that research data were being collected, extension efforts were being utilized to increase communication between the scientists and farmers, to stay abreast of production practices and concerns, and to educate growers concerning opportunities for increasing production efficiency of their management systems. A research paper has been written for publication in a technical journal, and results of the survey have been presented to growers and county extension educators at annual watermelon conferences. Increased communication has enhanced the opportunities for development of new markets, and allows growers, research scientists, and extension specialists to plan for future growth in the vegetable industry. Planning sessions have been conducted with research scientists, extension educators, growers, and agri-business personnel to prioritize needs and identify opportunities for growth of the vegetable industry. This project was supported in part by a CSREES Special Grant.

Contact Name: Warren Roberts

Planned Program or Activity: Vegetable Production Practices

Brief Progress Report: Research involving various cultural practices for vegetable production was conducted at the Wes Watkins Agricultural Research and Extension Center. Experiments included studies in plant population density, plant spatial arrangements, stand establishment, germination requirements, and root volume requirements. Field days were held during the summer to exhibit current findings of this research. Researchers from OSU and USDA/ARS along with extension specialists from OSU worked cooperatively to demonstrate research results with growers, agri-businessmen, community leaders, and policy makers. Results were presented to growers and Oklahoma Vegetable Association directors at annual vegetable meetings. A facilitated workshop was held to allow growers and agri-businessmen to express their needs and limitations concerning vegetable production, to identify and prioritize specific research and extension needs, to prioritize methods of extension information exchange, and to enhance opportunities for improved marketing and market development. Research and extension needs as prioritized by growers and agri-businessmen at the workshop will be used to guide the direction of future research and extension projects, and to insure that research and extension efforts are designed to meet the needs of the vegetable industry. This project was supported in part by a CSREES Special Grant.

Contact Name: Warren Roberts

Name of Planned Program/Activity: Alfalfa Integrated Management research/demonstrations in Oklahoma

Brief Progress Report: In final stages of completing two thrust efforts in integrated management research/demonstration on research stations and with cooperating producers. First

thrust is determining interaction of fertility and weed competition in thinning stands when multiple pest resistant variety is used and insect pest are controlled when they reach the economic threshold level. Alfalfa was found to be very competitive when stem densities were above 25-stems/sq. ft. but weeds became competitive with alfalfa at lower densities. Therefore, it was critical to control weeds in fertilized thinning stands. The second thrust compared conventional haying 1st harvest of thinning alfalfa stands where pest are controlled with chemicals with fall drilling of cool-season grass (wheat and ryegrass) and forage harvest by grazing. Forage production was drastically increased with the cool-season grass fall drilling and weeds and insects were controlled in combination with the grazing. Thus, pesticide use was decreased and profits were increased.

Contact Names: Jim Stritzke and Gerrit Cuperus

NAME OF PLANNED PROGRAM/ACTIVITY: **HIGH PLAINS IRRIGATION CROP SYSTEMS**

Brief Progress Report: **RESEARCH WILL BE INITIATED THIS SUMMER DETERMINING THE BENEFITS OF LIMITED IRRIGATION ON CROP PRODUCTION IN THE OKLAHOMA PANHANDLE, CONSERVATIONAL TILLAGE UNDER IRRIGATION, AND PHOSPHORUS REMOVAL USING SUBSURFACE DRIP IRRIGATION. P**resentations have included weed control in winter wheat (15 people in attendance), the profitability of corn versus grain sorghum at current natural gas prices (20 people in attendance), and ongoing research at the Oklahoma Panhandle Research and Extension Center (OPREC) (35 people in attendance). Participated in Crop Production clinics at the OPREC (95 people in attendance for the various meetings).

CONTACT NAME: MARK L. WOOD

Name Of Planned Program/Activity: Soybean Improvement

Brief Progress Report: Two new soybean varieties were released in 2000. Washita is a new Maturity Group V variety particularly well adapted to Central Oklahoma. It has good shattering and lodging resistance and moderate Root-Knot Nematode resistance. Washita averaged 3.2 bu/A more than the Hutcheson check in seven tests at the South Central Research Station, Chickasha, Oklahoma. Catoosa is a new Maturity Group V variety well adapted to Eastern Oklahoma. It also has good shattering and lodging resistance. Catoosa is also resistant to Root-Knot Nematode and Soybean Cyst Nematode. It averaged higher in yield than Hutcheson at Bixby (9 tests), Haskell (3 tests), and South Coffeyville (2 tests). All of these locations are in Eastern Oklahoma. Both Washita and Catoosa were evaluated in the Oklahoma Soybean Variety Test at multiple locations and over several years prior to release. They were both entered into the Oklahoma Pedigreed Seed Program in 2000. Foundation Seed was produced in 2000. Registered Seed will be produced in 2001 and Certified Seed in 2002 and future years.

Contact Name: Lewis H. Edwards
CSREES Goal 3: Integrated Activities

Name of Planned Program/Activity: Rural Health Issues – Building Budgets and Other Tools For Rural Health Issues

Brief Progress Report: Data have been collected to devise physician feasibility, adult day care and outpatient rehabilitation. Other budgets are currently being devised. In addition, a health impact model which measures impact of health on local economy has been developed. These tools are being used by Extension in community health planning.

Contact Name: Gerald Doeksen

Name of Planned Program/Activity: National Nutrition, Food Safety, and Health Specialists Conference

Brief Progress Report: Efforts have been made towards a national nutrition, food safety and health specialists conference in March 2001. This conference will strategize and network around critical and emerging issues in nutrition, food safety and health. This conference will focus on developing a conceptual framework to address accountability issues at the local, state and national levels. In addition, this conference will explore ways to work on multi-state projects and accessing integrated resources.

Contact Name: Janice Hermann

CSREES Goal 4: Integrated Activities

Name of Planned Program/Activity: Improved Alfalfa Management Through the Use of IPM Practices

Brief progress report: Research conducted by many different persons is devoted to the identification of improved alfalfa management. The main areas include: Insect Management in Alfalfa, Weed Management in Alfalfa, Alfalfa Diseases, Stand Establishment, Fertilizing Alfalfa, Forage Yield and Quality, Haying: Handling and Storage, Grazing Alfalfa, Marketing, Irrigation, Alfalfa Seed Production, and Economics of Producing Alfalfa. Results of these activities are included in the award winning web site, Oklahoma Alfalfa, at www.agr.okstate.edu/alfalfa/ and in a soon to be published circular, Oklahoma Alfalfa Production Guide. These highly integrated activities assist in the promotion of improved alfalfa production practices and integrated pest management.

Contact Name: John Caddel and Jim Stritzke, compilers and editors

Name of Planned Program/Activity: Development of Models for Atmospheric Dispersion

Brief Progress Report: In conjunction with an animal odor project, software for the calculation of dispersion from point and area sources is being developed. Concentrations can be obtained at selected receptor locations as well as across a rectangular grid. The software can eventually be used as a planning tool or in an operational mode for hog facilities or other enterprises where

pollutants are released. On the Web, there is already an operational model, the Oklahoma Dispersion Model, available in the Models section of the Oklahoma Mesonet AgWeather page (http://agweather.mesonet.ou.edu). This formed the basis for a new OSU Fact Sheet, "Movement of Odors Off Farm", that won the 2000 ASAE Blue Ribbon Award in the Educational Aids Competition.

Contact Name: Dr. J. D. Carlson

Name of Planned Program/Activity: Irrigation Scheduling for Oklahoma Growers

Brief Progress Report: In conjunction with a grant, work was begun on developing irrigation scheduling software for growers of various crops across Oklahoma. The software allows growers to specify crop and field parameters, input daily rainfall and/or irrigation amounts, and utilizes Oklahoma Mesonet reference ET values to calculate appropriate crop coefficients. Output consists of both tabular and graphical information depicting the current water situation and the proper time and amount to irrigate. After completion in mid 2001, the software will be distributed to state Bureau of Reclamation offices (the source of the funding) and workshops will be given in its use. Other venues for distribution/training will be utilized as well (extension, grower meetings, etc.). On the Web, the Oklahoma Evapotranspiration Model, which calculates reference ET values at Mesonet sites, can be found in the Models section of the Oklahoma Mesonet AgWeather page (http://agweather.mesonet.ou.edu).

Contact Name: Dr. J. D. Carlson

Name of Planned Program/Activity: Measurement of Progress and Constraints to Stored Product IPM Adoption

Brief Progress Report: During the spring of 2000, elevator workshops were held in six locations around the state, with roughly 150 grain elevator employees in attendance. This past summer, we held three fumigation workshops (attendance: 26 commercial fumigators, plus 15 regulatory officials) and one food processing workshop (attendance: 56); proceedings from these workshops are available. Post workshop evaluations were positive, with several indicating they will use the information they received. A 6-month follow-up survey is in progress, to assess what changes they did make as a result of the workshops. A new Stored Products IPM Web site was launched, at http://ipm.okstate.edu/ipm/stored_products/stored_products..html. During this time, two research papers regarding management of a significant insect pest of stored wheat were accepted for publication in refereed journals. In September, we broke ground for the new Stored Product Research and Education Center. This state-of-the-art facility will contain steel and concrete grain bins, grain elevators, and other equipment to conduct research in stored products. This facility, once completed in the summer of 2001, will be used for multiple hands-on demonstration and education workshops.

Contact Name:
Gerrit W. Cuperus
Pat Bolin

Name of Planned Program/Activity: Testing and Advising on The Use of Electrochemical Water Conditioning Devices for Improving Turfgrass Irrigation Water Quality

Brief Progress Report: Several electrochemical and/or electromagnetic water conditioning devices have entered the market place in recent years. Several of the companies marketing these devices claim that the conditioning effect upon irrigation water reduces the detrimental effects of deficit irrigation, high levels of sodium or total soluble salts in irrigation water as well as improves water use efficiency.

Due to the growing national crisis regarding irrigation water availability and quality, a cooperative research project between the USGA Greens Section Agronomist (Dallas, TX) and our turfgrass program was undertaken in 2000. In our two research experiments conducted to date at Stillwater, OK, the particular device that was tested failed to deliver improvements in water use efficiency, turfgrass visual quality or clipping dry matter yield under conditions of deficit irrigation on Tifway bermudagrass.

At the December 2000 Annual Texas Turfgrass Conference and Trade Show in San Antonio, thirty-two turfgrass industry leaders were presented with information that the electrochemical water conditioning device which we tested had no beneficial effects on classical irrigation water properties nor on turfgrass tolerance to deficit irrigation. We urged potential purchasers of water conditioning units to demand research-based information from sales representatives before making a purchase of a product as well as to demand a written guarantee of product performance so that funds spent on water conditioning devices are not wasted or diverted from more appropriate applications. National distribution of our findings and suggestions are planned in 2001.

Contact: Dennis Martin

Name of Planned Program/Activity: Integrated Wildlife, Timber and Livestock Management Options

Brief Progress Report: A total of ten units were burned. Field data was gathered on all 28 units this year. This included forage production by eight categories, shrub and tree density and basal areas and canopy cover. A color field guide showing history of treatment development and with supporting data summaries was developed for those participating in tours of the area. In 2000, some 145 land managers or owners have toured the area as part of 8 field days, Workshops or field trips. Groups have included BIA land managers, Master Woodland Owners, Pushmataha Co. Cattlemen's Association, USFS Silviculturalists and Biologists, ODA Foresters, ODWC Biologists and 3 college classes. Early in the year Outdoor Oklahoma featured the area on a television program that was broadcast 12 times to an estimated viewership of over 100,000.

Contact Name: Ron Masters, Extension Wildlife Specialist

Name of Planned Program/Activity: Strategies for Integrated Control of Musk Thistle in Oklahoma

Brief Progress Report: Extension Educators and landowners collected 71,000 musk thistle head weevils in four northeastern counties in the Spring of 2000, and released them on 142 new

sites in 20 counties. This program since initiation in 1991 has released a total of 250,000 musk thistle head weevils. In addition, 13,600 rosette weevils were collected and released on 22 new sites in Oklahoma in 2000. Five demonstrations were established in 1999-2000 in eastern Oklahoma. About 120 landowners attended tours of the demonstrations in spring of 2000. They saw results of chemical and biological control; plus signed up for release of weevils on their land. Two fact sheets were published in 2000, one on "Integrated Control of Musk Thistle" and one on "Thistle Identification".

Contact Names: Jim Stritzke and Gerrit Cuperus

Name of Planned Program/Activity: Managing Waterborne Plant Pathogens of Nursery Crops in Recycling Irrigation Systems

Brief Progress Report: In addition to OCES base funding, three grants (two research and one extension) provided excellent support for this integrated effort. During 2000, several major educational products (listed below) were delivered to the nursery industry. These educational products transferred new research results directly to the nursery industry. Brief reports of research appeared, and an MS thesis will be completed by May 2001.

Educational Products:
1. Educational web site: "Disease management for nurseries using recycling irrigation systems", http://zoospore.okstate.edu/nursery
2. Educational videotape (with M.A. Schnelle, Horticulture and Landscape Architecture): "Capturing and Recycling Irrigation Runoff to Protect Water Quality", OCES, VT 870 (28 min), October 2000.
3. Educational manual: "Capture and Recycle Guide for Nurseries", in press
4. Book chapter: "Disease management for nurseries using recycling irrigation systems", IN Diseases of woody ornamentals and trees, APS Press, May 2001.

Contact Name: Sharon L. von Broembsen, Entomology & Plant Pathology

CSREES Goal 5: Integrated Activities

Name of Planned Program/Activity: Solid Waste Issues – Devising Budgets for Solid Waste Alternatives

Brief Progress Report: Cost data have been collected for recycling centers, transfer stations, and landfills. The data will allow extension workers to evaluate the costs of these facilities for rural communities. In addition, extension workers can evaluate whether a transfer station is cheaper than a landfill. Economies of size in landfills were also measured.

Contact Name: Gerald Doeksen

Name of Planned Program/Activity: Retail Trade Gap Analysis

Brief Progress Report: A database and methodology has been developed to analyze local retail trade trends and identify gaps in market trade capture. Over the past year over 15 communities have utilized this program in Extension education settings.

Contact Name: Mike D. Woods

Name of Planned Program/Activity: Targeted Economic Development

Brief Progress Report: Currently, M.S. candidate within the Agricultural Economics Department is completing her thesis. Research relates to targeted economic development strategies and has already been utilized in Extension programs. A methodology and database has been developed to aid local leaders in economic development efforts.

Contact Name: Mike D. Woods

Name of Planned Program/Activity: Legal Issues in Agriculture

Brief Progress Report:

1. Research was conducted concerning Estate Tax Laws and proposed modifications. Extension programs were presented on estate planning and technical assistance was provided to extension agents.
2. Research was conducted on the farm financial situation and this information was summarized in a Visions article and in handouts that were provided to other extension personnel and farm group leaders. Supervised a student's honors' thesis on this topic and served on the Farm Financial Crisis Task Force of the Oklahoma Bar Association.
3. Research was conducted related to liability for spread of fires set by controlled burning. Case law and statutes were reviewed and summarized. An article was drafted for submission to a journal.
4. Research was conducted related to regulation of biotechnology. An informal masters' report was developed by a graduate student. Served as a guest lecturer in a graduate international issues class concerning this topic.
5. A joint extension program related to change on the family farm was developed in conjunction with several other state agents. Programs were presented concerning organizational alternatives.
6. Served on the Ag Leadership selection panel, screening applications and interviewing applicants.

Contact Name: Marcia Tilley