PLAN OF WORK

ANNUAL REPORT
OF
ACCOMPLISHMENTS AND RESULTS

PURDUE UNIVERSITY
COOPERATIVE EXTENSION SERVICE

FEDERAL FISCAL YEAR
2005

Submitted by:
Dr. David C. Petritz
Associate Dean of Agriculture
and
Director – Cooperative Extension Service

April 1, 2006

Table of Contents

PREFACE

The “Indiana Annual Report of Accomplishments and Results” which follows provides information about accomplishments resulting from work performed by faculty and staff of the Purdue University Cooperative Extension Service during FY 2005. The report is organized so as to correspond with the five national goals and our plan as submitted under those goals. The Annual Report includes six components: Planned Programs; Stakeholders’ Input Process; Program Review Process; Evaluation of the Success of Multi and Joint Activities; Multi-state Extension Activities; and Integrated Research and Extension Activities. This report indicates acceptable progress toward our overall goals.

Impact statements from Purdue's Colleges of Agriculture and Consumer and Family Sciences, the School of Veterinary Medicine, and the Cooperative Extension Service may be viewed at the following website: http://www2.agriculture.purdue.edu/impact/.

.

David C. Petritz
Associate Dean of Agriculture and
Director, Purdue University Cooperative Extension Service
102 Agricultural Administration Building
615 West State Street
West Lafayette, IN 47907-2053
Telephone: 765-494-8489
Fax: 765-494-5876
Electronic mail: dpetritz@purdue.edu

Goal One. An agricultural system that is highly competitive in the global economy. Through research and education, empower the agricultural system with knowledge that will improve competitiveness in domestic production, processing, and marketing.

Overview

Purdue Extension focused on several programs related to Goal One. For FY 2005, a total of 8,303 contact days were devoted to primarily three programs: Agricultural Competitiveness, Horticulture and Turf, and Alternative Agricultural Enterprises and Practices. Through state-wide and county based workshops, test plots, conferences, and educational materials, extension staff concentrated on crop and animal production systems, marketing, and risk management strategies that improves production efficiencies, makes producers more competitive, and adds value to Indiana agricultural products. Indiana's state population is 99% non-agricultural. Urban needs place a great demand on the state's natural resources as well as Purdue Extension's resources to meet these needs. The increased demand for home and consumer horticulture has caused us to reallocate resources to deliver programs and educational information to areas such as Master Gardeners, urban gardening, and life-style farms. These efforts resulted in a reported 134,711 people being contacted among these three programs.

Educating the general public on agricultural animal and crop issues is important if producers are to remain competitive and have their products accepted. Both adults and youth were introduced to the various aspects of environmental issues that are everyday challenges to the farmer and to the new emerging technologies or adaptive tools that are available to him as a means to improve his competitiveness. This past year field and campus staff, combined with help from our state and federal conservation partnering agencies, devoted 1,979 contact days to programs that exposed 131,195 adults and school aged youth to an awareness and understanding of agricultural issues.

Indiana is experiencing a rapid growth in diversification of crop and livestock production opportunities. Producers in Indiana have faced a multifaceted farming shift over the past decade, whereby small to mid-size farmers of traditional corn, soybeans, and swine production have had to take off-farm employment, and large producers have had to diversify their cropping system in order to stabilize their economic situation. Many traditional agronomic crop and livestock producers are adding horticultural crops to their mix of crops and are contracting with food processors for an increasing acreage of Indiana farmlands. This is a new but rapidly increasing area of outreach for the state, and Purdue Extension is building a local and statewide agency network to address this demand for transitioning to alternative opportunities. Last year Purdue Extension spent 740 days and made 5,807 direct contacts with citizens of the state who were exploring the feasibility of alternative agricultural opportunities, which ranged from home-based businesses to organic crop and livestock production to direct marketing of produce.

Purdue Extension works closely with the extension programs in other states on issues of agricultural competitiveness. Many of the campus Extension staff have research appointments. They use these appointments to address the outreach needs of Indiana crop and livestock producers. Ongoing research and extension programs, in collaboration with research and extension staff in other states, are addressing the issue of on-farm quality assurance of value-added grains and livestock production as well as working on the proper and legal use of animal manure as crop nutrients. Several examples on this collaboration will be given in the Key Themes section of this report.

Purdue Extension feels that the accomplishments we are making in the issue areas identified under Goal One are positive and are meeting the intended objectives and goals that the stakeholders identified as needs for the state. Short-term outcomes of awareness and knowledge gained are being accomplished in our Agricultural Awareness programs, while we are noticing intermediate and long-term outcomes of adoption of practices and technology changes with the other identified issues. Great strides have been made at improving the competitiveness of the beef cattle and small diversified producers of Indiana through the efforts of Purdue Extension programs.

Resources: Approximately $ 2,222,038.20 and 48.4 FTEs have been invested in Goal 1. This is a best estimate and these are not presented as auditable numbers.

Key Theme: Adding Value to New and Old Agricultural Products

Demand for Certified Meat Products

Description: Consumer demand for process verified products appears to be rising, however it is unknown whether consumer willingness to pay exceeds the costs of certifying compliance with process standards. In addition, it is not clear to what extent markets will expand to increase market access for farmers who see dwindling alternatives in the marketplace. Purdue Extension estimated the willingness to pay for natural pork products and determined the potential for market expansion with the introduction of such a certified product. This was done in the context of an assumption of heterogeneity on the part of consumer demand whereas previous theoretical work assumed that all consumers uniformly preferred the certified product. Members of the farm community can find new marketing opportunities in the area of natural pork production if they develop appropriate standards aimed at meeting concerns of consumers and use a third party to verify their compliance with those standards. The analysis was developed by a pilot business plan used by the Agricultural Innovation and Commercialization Center at Purdue as a model for a marketing process of a product.

Impact: The results of our analysis suggest that there is a large segment of consumers (~43%) who have substantial willingness to pay for antibiotic free, environmentally friendly, and animal welfare certified pork. The results suggest that as much as 62 % of the market could transition to such a product in the long run. Members of the farm community and groups of farmers are

beginning to examine the development of standards for similar products. The details of developing standards and the strategies associated with launching such new products with these groups were discussed.

Source of Funds: Smith-Lever, Hatch, State

Scope of Impact: Nationwide

Key Theme: Agricultural Competitiveness

New Molecular Marker for CystX® Will Speed Development of New Soybean Varieties

Description: Commercial development of high-yielding soybean varieties with CystX® resistance to soybean cyst nematode (SCN) has been slowed by the complex genetics of CystX® technology. SCN is the major pest of soybean, widespread in all soybean producing areas including Indiana. It is best managed by planting resistant soybean varieties. Our SCN resistant germ plasm, known as CystX®, can greatly improve SCN management options. Breeders have been working for several years to incorporate into high-yielding soybean lines our patented germ plasm (CystX®), which provides complete and broad-based resistance to soybean cyst nematodes (SCN). Five major companies (including Monsanto) currently have CystX® lines in second-year trials. Commercial deployment of CystX® has been slowed, however, by the complex genetics of the CystX® technology. Recently, researchers at Purdue and Indiana Crop Improvement Association, with partial support from the Indiana Soybean Board, discovered and validated a single nucleotide polymorphism (SNP) linked to the major locus of SCN resistance in our germ plasm. This SNP is a single change in soybean DNA that recognizes the most important part of the resistance (major locus) when it is present.

Impact: Purdue researchers patented a germplasm for use in soybeans that provides the crops with complete resistance to soybean cyst nematode (SCN). Introduction of the CystX® germplasm into commercial soybean lines has been slow to occur because of the complex genetics involved, however. Additional research by Purdue and the Indiana Crop Improvement Association identified a molecular marker linked to a major resistance locus of CystX® that can be easily detected in resistant lines. The ability to screen new lines quickly with this marker will save breeders time and labor and increase their efficiency. The discovery of this marker and its easy detection are of significant importance to plant breeders and should speed the incorporation of CystX® resistance into soybean varieties suitable for all of the 60,000,000 acres in the U.S. that are infested with SCN. At current prices this comes to more than $300 millions.

Source of Funds: Smith-Lever, Hatch, State

Scope of Impact: Nationwide

Key Theme: Agricultural Profitability

Genetics of Pork Quality and Swine Lean Growth

Description: Ractopamine, a feed additive, increases lean growth and carcass lean percentage. Ractopamine is being fed to pigs of varying environments. Also, the response to Ractopamine decreases with the duration of feeding. Birth weight has a major impact on pre-weaning growth and days to achieve an acceptable market weight. As litter size has increased via genetic selection and management, the number of light weight pigs at birth has increased. A research trial was completed comparing three Paylean™ step-up programs to a constant and control treatments. The data was used to refine a Ractopamine feeding model. Also, a trial was completed on the response of Ractopamine when fed to high and below average health status pigs. The results confirmed a constant percentage improvement in both environments. Data has been collected and the relationship of variation in birth weight between and within litters is being evaluated. Genetic parameters for litter birth weight have been estimated. Rates of genetic progress expected by selection for increased pig birth weight have been estimated.

Impact: The data indicated Ractopamine step-up programs can extend to response to Ractopamine. Currently, 50 to 60 % of all market pigs (50 to 60 million) are being fed Ractopamine. Step-up programs can increase returns from $0.80 to $1.10 per pig over pigs fed constant levels of Paylean™. Selection for increased pig birth weight has been initiated in the purebred herds and other seedstock herds. The result should include decreased pre-weaning mortality and increased pre-weaning growth and ultimately reduced variation market weight.

Source of Funds: Smith-Lever, Hatch, State

Scope of Impact: Nationwide

Key Theme: Animal Production Efficiency

Computer Programs for Decision-making in Animal Feeding

Description: Feed costs for most livestock enterprises make up over 50% of total costs. Feeding to meet nutrient needs without spending extra money or providing excess nutrients is an important way to control costs and reduce negative environmental impact. Balancing rations for livestock remains an important part of maintaining the health, well-being and profitability of animals and the animal enterprise. Calculating rations manually is an error-prone mathematical problem. Producers need easy to use and up to date programs and procedures to make proper rations. Ration balancing programs previously developed continue to be updated and supplied to producers and extension educators. An online-tutorial is being used by first-time users and to assist and attract potential users. The tutorial leads the user through the ration balancing process,

familiarizes the potential user with the computer program, and illustrates results. Web pages that describe ration balancing methods are provided.

Impact: Requests for programs are received from throughout the country (even though usage remains small). Free online materials are accessed extensively. An average of 90 hits per month are received on a paper describing ration balancing principles. Some of the materials are available for free download. Feed costs represent over 50% of total costs of most livestock enterprises, and properly balanced rations decreases feed costs, enhances animal performance and helps control environmental pollution from excess nutrients in animal waste. Decision support software for nutrition, to optimize nutrient utilization, maximize animal performance and maximize profits is available for beef and swine producers. An enhanced online tutorial aids understanding and use of the program.

Source of Funds: Smith-Lever, Hatch, State

Scope of Impact: Nationwide

Key Theme: Bioterrorism

Innovations in Handling Large-Scale Animal Mortalities

Description: The United States exists with a heightened sense of awareness of its vulnerability to the effects of disease, weather, and terrorism. Widespread, large-scale livestock deaths could result from any of the aforementioned causes. The carcass disposal challenges stemming from large-scale livestock deaths could prove daunting and require careful planning and action to prevent major food security problems and massive economic losses. A team of Purdue University personnel including Don Jones, Stephen Hawkins, and Daniel Ess produced a chapter focused on non-traditional and novel technologies that was part of a report entitled, Carcass Disposal: A Comprehensive Review. The report was produced for the USDA-Animal and Plant Health Inspection Service (USDA-APHIS) by a consortium of collaborators that formed the Carcass Disposal Working Group. The group included personnel from the Kansas State University's National Agricultural Biosecurity Center, Texas A&M, Sandia National Laboratories, and Purdue University. The report contains 17 chapters in two parts, the first addressing a wide range of disposal technologies, the second dealing with cross-cutting and policy issues including economics, regulatory issues, and environmental impacts.

Impact: A major report entitled, Carcass Disposal: A Comprehensive Review was created by a consortium that included a team from Purdue University. The report, produced for USDA-APHIS, is targeted at officials that would have to deal with the effects of widespread, large-scale livestock deaths resulting from disease, weather, or terrorism. The report, intended to serve as an indispensable resource for officials tasked with planning for safe and timely disposal of animal carcasses, has been requested by interested parties in the United States, Australia, Great Britain,

and Canada. It has also been downloaded from the National Agricultural Biosecurity Center website more than 8,000 times.

Source of Funds: Smith-Lever, Hatch, State

Scope of Impact: Nationwide

Key Theme: Diversified/Alternative Agriculture

Growing Entrepreneurial Agriculture in Indiana

Description: The world of agriculture is changing. Producers are moving from commodity agriculture to product agriculture. As agricultural entrepreneurs are searching for ways to add value to their commodities, they are asking questions such as, how to start new business ventures and what are the laws and regulations involved in these ventures. They are also asking if there is a market for what they want to sell. In order to help agricultural entrepreneurs answer these questions, the New Ventures Team was initiated to link them with resources and guides to help them down the road they have chosen. Purdue New Ventures Team has responded to entrepreneurial requests by providing individual consultation, referrals to other agencies and organizations, educational resources provided, and introduction to the web based Business Planning Tool. Grant writing workshops have been conducted as well as Entrepreneurial workshops and starting new business workshops. These activities were evaluated by the use of surveys.

Impact: Purdue New Ventures Team has responded to entrepreneurial requests by providing individual consultation, referrals to other agencies and organizations, educational resources provided, and introduction to the web based Business Planning Tool. 90% of the survey respondents gained information needed to start the process to begin planning their new venture. Of the survey respondents, 80% received answers to their questions, 40% received resource materials, 70% received people to contact, 50% received the names of agencies, organizations and associations to contact, and 30% received ideas to try immediately. 60% received the background tools necessary to do a thorough self-assessment. Fifty percent of the respondents have officially started a new venture. Of the 50% that have not started a new venture, 100% stated that they would continue working with a new venture team member. Seventy percent of the respondents reported that they were able to identify the next step to take in pursuing a new business idea.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Home Lawn and Gardening

2005 State Master Gardener Conference

Description: Started in 2004, the State Master Gardener Conference is a way to bring in Master Gardeners from across the state to share ideas, hear guest speakers, and make contacts that might otherwise not be possible. The Conference Committee consisting of Master Gardeners and Coordinators from Lake and Porter Counties put together a two day conference which included a pre-conference tour, 4 breakout sessions with 12 sessions, 3 general sessions and a keynote session.

Impact: There were 55 Master Gardeners in attendance at the conference. Surveys were mailed to all registered participants two months after the conference. Of the 25 replies (45% return rate), 84% indicated that they came away with resource materials that they could use, 76% gained ideas they will use in their garden, and 24% gained ideas they will try in their community. The most frequent reply to the questions "What will you or have you done differently as a result of what you learned at this conference?" was increase use of native plants, changes in landscape design, and increase the use of herbs (3 replies each). All other replies were unique and ranged from taking more pictures and changing how they use garden tools to attempting their own hybridization. The survey also indicated several weaknesses in the conference including the location, conference cost, and time of year.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Organic Agriculture

Organic Farming

Description: Small farms continually seek ways to improve sustainability. One way many farmers explore is in transitioning to organic farming. Because of interest in organic farming, I have worked with certifying groups and local farmers to set up meetings on organic certification. In 2005, three meetings were held in LaGrange County which I set up. The first was a meeting with Ohio Ecological Food and Farm Association for local dairy farmers to meet face to face with a certifier they have chosen to work with. This meeting helped to answer questions many had about steps toward transitioning their farm. The second meeting was with Indiana Certified Organic and the third meeting was with the ip video broadcast on organic processing.

Impact: As a result of organic certification meetings for local dairy farmers, CROPP Cooperative (Organic Valley) reports that they will have 19 local dairy farms on-line and marketing certified organic milk through them by the spring of 2006.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Ornamental/Green Agriculture

Educational Programs in Turfgrass Disease Management

Description: The establishment and maintenance of safe attractive lawns, landscapes and playing surfaces have economic, environmental and social benefits to all citizens of Indiana. Infectious turfgrass diseases can limit those benefits, especially if problems are misdiagnosed and appropriate remedial treatments are not applied. Turf managers need accurate information regarding disease symptoms, conditions that favor disease, and control options in order to avoid effects of serious turf disease outbreaks. I have prepared a series of educational programs that focus on turfgrass disease identification and control. They are targeted to turfgrass managers (including golf course superintendents) and conducted in a variety of venues, where attendance may range from 50 to 1,000. The programs cover the identification and control of 20 common diseases of turfgrass in Indiana. Emphasis is given to the nature and management of outbreaks that were common across the state during the most recent growing season. Educational programs are supported by the Turfgrass Disease Profiles, a collection of web-based bulletins that describe diseases and offer specific recommendations for professional and residential turf managers.

Impact: These programs are designed to increase the awareness of turfgrass diseases. It is expected that participants in the meetings and workshops will improve their field diagnostic skills and gain a better understanding of disease signs and symptoms. It is also expected that turf managers will be better prepared to adjust control tactics to target specific disease threats and to use fungicides in ways that are both efficient and effective. Exit surveys show that more than 90% of attendees and participants gained an increased awareness of diseases and modern control options. Approximately 40% indicated that the presentations will help them adjust their management approaches to use less fungicide while maintaining acceptable levels of disease control. The programs are expected to increase awareness of turf disease signs and symptoms and improve disease management with judicious use of fungicides.

Source of Funds: Smith-Lever, Hatch, State

Scope of Impact: North Central Region

Key Theme: Plant Health

Plant and Pest Diagnostic Laboratory

Description: Growers, businesses, Extension personnel and other citizens throughout Indiana have plant and pest problems that require accurate and timely diagnosis as well as sound recommendations of management strategies. Purdue's Plant and Pest Diagnostic Laboratory (P&PDL) assists Indiana citizens and businesses in growing healthier plants. They educate their clientele on the effective and efficient use of pesticides, thus not only saving money for their clientele but encouraging good stewardship of the environment.
Over the last fifteen years approximately 37,000 plant and insect samples have been sent to the P&PDL for diagnosis. Each sample has been accompanied by its own unique set of background information and each diagnosis has required individual attention by one of the Lab's diagnosticians. Selected in-depth laboratory tests for specific pathogen identification have been utilized when necessary. The Plant and Pest Diagnostic lab provides the needed accurate and timely diagnosis of plant and insect problems as well as the necessary management strategies. The Plant and Pest Diagnostic Laboratory provides digital imaging equipment at fifteen locations in Indiana and trained Extension Educators at those locations on the use of the equipment. A Digital Diagnostics Web site was developed by the Lab specifically for use by Indiana Extension Educators. The Web site includes a digital image library with identification and control recommendations, as well as web-based forms for submitting digital images. The P&PDL also opened this digital diagnostics site to the general public. At the present time, the general public can visit the Virtual Plant and Pest Diagnostic Laboratory at http://www.ppdl.purdue.edu.

Impact: From January through September, the 2005 staff diagnosed 1443 samples of which 64 percent of the diagnoses were completed in five days or less. Trees and shrubs comprised the largest group of samples (33 percent), followed by agronomic crops (25 percent). The vast majority of tree and shrub problems diagnosed did not require the use of pesticides for control. Examples of such problems included poor root growth due to unfavorable environmental conditions (moisture extremes) , poor root establishment due to transplant shock, as well as maple bladder gall and foliar leaf spots , both of which are aesthetically displeasing, yet not life threatening to the tree. Identification of specific fungal and insect problems on greenhouse ornamentals often required “prescription” fungicide and insecticide recommendations. These pesticide recommendations were suggested for timely and effective management of specific greenhouse problems.
Accurate diagnoses by the P&PDL diagnosticians helped many Hoosiers make educated purchases of pest control materials. Recommendations for the proper use of pesticides assisted both businesses and homeowners in preventing the spread of certain diseases and insects in a more environmentally friendly manner.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Small Farm Viability

Seymour Farmers Market

Description: Farmers and Homeowners needed a direct avenue to sell produce to the local consumer. This produce could be grown directly for sale or extra produce from the home garden. Also, local consumers are looking for sources of fresh, locally grown produce. Extension Educator worked with the Greater Seymour Chamber of Commerce and Seymour Mainstreet, Inc. to develop and promote the Downtown Seymour Farmers' Market. Extension Educator worked with producers/gardeners to assist them in growing the crops that would be sellable at the local market. The Jackson County Extension Office conducted an educational program for the growers on improved production practices and on the use of WIC (Women, Infant & Children) Farmers' Market Nutrition Vouchers. An additional day was added to the schedule of the market, making the market open 3 days a week. This additional day improved access for both the sellers and the consumers. The Jackson County Extension Service also handed out nutritious recipes that used seasonal produce that was available for purchase at the market.

Impact; The market gave producers and home gardeners an opportunity to market excess produce and earn extra money for their farms and families. Most vendors, who participate, sell out before the allotted market time to over. The Extension Educator has received many positive comments from the public on how this market is a valuable resource for the community. Through the use of a survey, 30% of the vendors said that they sell over $1000 worth of produce within the marketing year, while setting up at the market an average of 8.3 times in the year.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Urban Gardening

City Gardener Program Helps Inexperienced Gardeners

Description: Over 264,000 households in Marion County are involved in gardening related activities. No comprehensive educational program addressed the needs of inexperienced urban gardeners. The local Extension board recognized this and suggested that action be taken. The City Gardener Program was developed when 94 percent of survey respondents indicated they were interested in a beginning gardening class (47% "very interested" and 47% "somewhat interested"). A Purdue horticulture educator and horticulture specialist developed the City Gardener Program for new or inexperienced gardeners in urban areas. The program was held at a local public garden on two Saturdays in July from 8:30am to 3:30pm. The 12 hours of training included lecture and "hands on" learning at White River Gardens in Indianapolis. The topics were chosen according to survey results and contacts with local gardeners. They included: How a

Plant Grows, Soil & Fertilizers, Pests & Pest Management, Tree & Shrub Selection & Care, Weed Identification & Control, Lawn Care, Vegetable Gardening, Animal Damage Management, and Annual & Perennial Flowers. Each participant received a reference notebook containing outlines of each presentation and supporting publications for the $30 registration fee. Pre and post tests and an evaluation survey were used to help measure impact.

Impact: Out of 13 people who attended the 2005 City Gardener Program, 12 participants completed the program and took the final exam. The average score for the pretest was 51 percent and the average post test score was 82. This represents an average increase in knowledge of 37 percent. Results of the post test showed that 92 percent received a score of 70 or more. A total of 12 program evaluations were filled out and returned at the last session. Program evaluations suggested that 100 percent of those who filled out the survey indicated that their knowledge of lawns and gardens increased as a result of the program. The evaluations also showed that 100 percent of the participants felt they became a better gardener as a result of the program. According to the survey, 100 percent of those attendees who gardened previously said they would change a gardening practice as a result. All participants indicated they became better gardeners and would change a gardening practice as a result.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

GOAL TWO. A SAFE AND SECURE FOOD AND FIBER SYSTEM. To ensure an adequate food and fiber supply and food safety through improved science-based detection, surveillance, prevention, and education.

Overview

Food safety and quality education provided by Purdue Extension continues to focus on all stages of the food handling system—production, processing, distribution, preparation, and consumption. Consumers expect a safe and wholesome food supply. The maintenance of that safe and wholesome food supply requires constant education of those that produce food, those that process and distribute it, those who prepare food and, ultimately, all consumers. The emphasis that Purdue Extension puts on this important issue is reflected by the 1790 days of effort reported on this topic by campus and field staff, and the 41,723 direct contacts made with educational programming.

Specific programmatic focus relates to the food service industry and to general consumers. Programs emphasized in the FY 2005 program year focused on food service-related industry. Programs include Food Safety Day, the National Restaurant Association program ServSafe, and the Purdue University Program Essentials of Food Safety and SuperSafeMark. These programs teach food safety sanitation to food service workers and provide the certification examination.

Purdue Extension food safety programs reach general consumers with research-based food safety basics. Curricula used encourage discussion, questions, participation, and involvement of the general public to help them learn basic concepts that can decrease the incidence of food-borne illness in this country. Food safety education is emphasized in both the Expanded Food and Nutrition Education Program and the Food Stamp Nutrition Education Program targeting low-income families. Other programs conducted in FY 2005 were: Professor Popcorn: Hooked on Health; and The Mystery of the Poisoned Panther Picnic, that teaches basic food safety concepts with games, music, and videotapes, and Food Irradiation.

Resources: Approximately $ 373,383.71 and 8.1 FTEs have been invested in Goal 2. This is a best estimate and these are not presented as auditable numbers.

Key Theme: Food Safety

Food Safety Day

Description: "Food Safety Day" is a two-hour retail food safety program intended for retail food workers and managers. The project goal was to develop a curriculum that emphasized safe food handling practices that focus on the most significant food handling problems, including time and temperature abuse, cross contamination, poor personal hygiene, and sanitation. The program fulfils a need and has been developed into four learning modules: Understanding Foodborne Illness, Good Personal Hygiene, Preventing Cross Contamination, and Avoiding Temperature

Abuse. The instructor kit that was developed contains hands-on demonstrations for each module packaged with 58 slides, an instructor's and a student's guide. The curriculum is available in Spanish and English as a hard-copy curriculum (slides or color overhead transparencies) and is now available for download on the World Wide Web (http://www.foodsci.purdue.edu/publications/foodsafetyday/).

Impact: To date, over 32,500 people have been educated using this program since development in 1996. Previous pre- and post-test data indicates that participants have learned better ($p<0.05$) food safety handling practices related to time and temperature control, good personal hygiene, and cross contamination control. The largest positive change ($p<0.05$) has resulted in better personal hygiene practices. The program has grown from a statewide program to a national and international program. We know that "Food Safety Day" has been used in 19 other U.S. states and is used extensively in Central America and South America. Maryland has recently incorporated "Food Safety Day" as part of their mandatory retail food handler training requirements. Three hundred fifty people were trained in Indiana in 2005. This retail food safety curriculum provides an important training need for retail food workers and managers. The training has been shown to improve food handling practices and, in turn, should reduce the risk and likelihood of foodborne illness associated with retail food establishments.

Source of Funds: Smith-Lever, State

Scope of Impact: IN

Retail Food Manager's Certification Programs

Description: Foodborne illness continues to be an important concern for consumers nationwide. The Center for Disease Control (CDC) estimates that between 76 million cases of foodborne illness, 325,000 hospitalizations, 5500 deaths, and costs of $7.7-23 billion may occur each year. Many of these reported foodborne illnesses have been attributed to the retail portion of the food production chain including food establishments such as restaurants, institutions, supermarkets, and convenience stores, etc. One of the important keys to prevent foodborne illness is through effective education and training for retail food establishment employees. Many states, including Indiana, now have food safety training and/or certification examination programs for food managers. As of January 2005, Indiana now requires at least one retail food manager from each retail food retail establishment be certified in retail food safety and pass a nationally recognized exam. Our program focus is to prepare retail food managers for this requirement and teach sound food handling procedures. Three programs are offered in Indiana to address these needs including ServSafe, Essentials of Food Safety and Sanitation, and SuperSafeMark. Each program has been developed as a nationally recognized curriculum and certification program for retail food handlers. Each program designed as an 8-hour or 16-hour program for retail food managers and is linked with a retail food certification exam developed by the National Restaurant Association of the National Registry of Food Safety Professionals. The targeted audience includes retail food managers and retail food workers. The program is also offered to corporate trainers and academic trainers that serve the retail food industry.

Impact: Within Indiana, the program is offered through Purdue University (Essentials of Food Safety and Sanitation and SuperSafeMark programs) and with the Indiana Restaurant and Hospitality Association (ServSafe program). Within Indiana, over 5000 people were certified during the reporting year. One hundred five retail food certification programs were offered in 38 different counties involving 28 different Extension Educators. Each program is offered through a partnership with local health department staff. Demographic data indicates that the majority of participants are at the management level (35%), are at least high school graduates (52%), have worked in food service 3 or more years (74%), and are Caucasian (87%). 4.1%, 3.1%, and 2.1% represent Hispanic, African American, and Asian participants, respectively. Data from our programs indicate that improvement is being made relative to safe food handling practices such as hand washing (36%), time and temperature control (32%), cross-contamination control (34%), cleaning and sanitation (31%). More participants (29%) are now also conduction food safety training in their food establishments.

Source of Funds: Smith-Lever, State

Scope of Impact: IN, National, International

Food Safety: Mystery of the Poisoned Panther Picnic

Description: "Mystery of the Poisoned Panther Picnic" is a food safety program aimed at grade school children. The program can easily be incorporated into the health, science, or family and consumer science curriculum in public and private schools. Students take a pre-test at the beginning of the program to assess their knowledge of food safety. Then, students view a videotape and lecture presentation, and participate in activities which reinforce the lesson. Finally, a post-test (duplicate of the pre-test) is completed by students at the close of the session to test for knowledge gained in food safety. This program has been quite successful, reaching 1,536 students from February 2003 to February 2006. The surprising fact is that only two Extension Educators are responsible for recruiting all of these participants!

The collective mean pre-test score for statewide participants was 8.6 and the mean post-test score was 10.1 out of 14 total points. Statistical analysis on this data revealed these mean pre and post-test scores to be significantly different from each other, and indicating that participants gain in their knowledge of food safety because of this program. The large number of subjects allowed for breakdown analysis of female compared to male participant scores. One interesting significant difference was found between the test scores of females compared to males. A mean post-test score of 10.4 was significantly greater ($P<.0001$) than the mean post-test score of 9.9 for males. However, the mean pre-test and knowledge gained (post-pre) scores for females and males were not significantly different. Female and male students demonstrated knowledge gained as a result of the program.

Analysis was also conducted to find differences between the participants by grade. Significant differences were found to exist in pre and post-test scores, which increased by grade level, but

not by the amount of knowledge that the students gained. This means that students in higher grade levels had higher scores but all grade levels gained the same amount of knowledge of food safety.

GOAL THREE. A HEALTHY, WELL-NOURISHED POPULATION. Through research and education on nutrition and development of more nutritious foods, enable people to make health-promoting choices.

Overview

The association between many chronic diseases and nutrition is becoming clearer. Careful nutritional choices can lead to decreased risks of certain cancers, coronary artery disease, diabetes, obesity, and osteoporosis. Nutrition education for adults and youth is essential to help form healthful dietary practices to support longer, healthier, and happier lives. Early educational interventions are critical, as it is easier to prevent the development of unhealthy eating and exercise habits than to change established habits. By increasing the knowledge base, especially of those who are educationally and economically at risk, healthy nutrition habits in children can be established early for higher quality of life. Purdue Extension emphasizes nutrition education across the state, devoting 4,571 days to nutrition education programming and making direct contact with 483,287 individuals.

The Dietary Guidelines for Americans continues to be the backbone of nutrition education in Indiana. Coupled with the My Pyramid and the Food Label, consumers can make informed dietary choices using basic nutrition information. Specific programs and settings vary throughout the state, but the Dietary Guidelines for Americans are included in all nutrition education programming.

The Vitamin D Education Program is a new addition to the host of Purdue Extension Educational Programs, and has been up and running since 2004. So far, 115 participants from 10 counties and 2 conferences have attended this program.

Nutrition education for youth audiences focuses on building better food habits and maintaining healthy weight. The “Exploring the Food Pyramid with Professor Popcorn Hooked on Health” curriculum reaches elementary school children across Indiana in school classrooms and in after-school programs. The program helps children learn about nutrition in a fun and innovative way to help them make wise food choices.

The Expanded food and Nutrition Education Program (EFNEP) and the Family Nutrition Program (FNP) are two nutrition education programs specifically targeted at limited-resource families. Indiana has both of these programs in 62 FNP and 31 EFNEP counties across the state as indicated by need and program budget. Both programs address wise nutrition choices, careful meal planning, food safety and sound food budgeting information for Food Stamp-eligible clients. This information assists limited-resource families to stretch their food resources, while still maintaining high-quality nutrition and a balanced diet.

Chronic disease is not the only health parameter affected by sound nutrition. Pregnancy outcome is affected by nutrition and lifestyle choices. The “Have a Healthy Baby” program continues to reach at-risk pregnant women across the state with information on adequate weight-gain

expectations, lifestyle habits for best pregnancy outcome, and good nutrition information. In FY 2005, 726 at-risk pregnant women were reached with the "Have a Healthy Baby" program. Results of this program continue to show lower rates of low birthweight infants in women participating in the program compared to state averages.

In 2004, Congress passed the Child Nutrition and WIC Authorization Act to establish a new requirement that all school district with federally funded school meals program(s) develop and implement wellness policies that address nutrition and physical activity by the start of the 2006-2007 school year. The National Alliance for Nutrition and Activity brought together a self-interest group from nutrition, health, physical activity and education to develop model policies for local school districts. The goal is to combat childhood obesity and create healthy environments for the prevention of childhood obesity and the health problems associated with poor nutrition and lack of physical activity.

Schools are being asked to set goals for nutrition education, physical activity and other school-based activities designed to promote student wellness. Schools must also set nutritional standards for all foods served during school time either from the school breakfast and lunch program, and from vending machines or snack shops. Schools are required to measure the implementation of the wellness policy and involve a broad group of individuals in policy development.

With an aging population and a rapid increase in obesity and sedentary lifestyles, diabetes has become a major health concern in Indiana. The rate of this disease is expected to rise over the coming years. Purdue Extension has included the Dining with Diabetes program as one of five target programs. Seventeen educators held programs in 18 counties and taught to 243 participants in 2005.

Purdue Extension Consumer and Family Sciences educators are beginning to take an active role in their communities to convene, engage, provide leadership to, and, in some instances, provide nutrition resources to self-interest groups for the development of school wellness policies for their school corporations. Additional training is needed to familiarize educators with the act and the supplemental educational materials available to use with School Wellness Policy coalitions.

Resources: Approximately $ 949693.36 and 20.8 FTEs have been invested in Goal 3. This is a best estimate and these are not presented as auditable numbers.

Key Theme: Human Nutrition

Unlock the Key to Vitamin D

Description: Vitamin D is an essential component to overall health and is not well understood by the general public. This educational program was designed to educate two separate target audiences, young and old adults, on the importance of Vitamin D. Educators select the program

information that they need for the audience they plan to instruct in Vitamin D education, and provide the participants age specific information on Vitamin D. Participants are informed of certain myths regarding Vitamin D, as well as the health benefits of adequate Vitamin D, and consequences of inadequate Vitamin D.

So far, 115 participants from 10 counties and 2 conferences have attended this program. Statistical analysis of statewide pre and post-tests indicate that significant gains in knowledge of Vitamin D are made as a result of the program. A mean post-test score of 9.6 was significantly higher ($P<.0001$) than the mean pre-test score of 6.1.

Strides in bone health and disease prevention can be greatly influenced by educational programs such as the Vitamin D education program.

EFNEP Education Improves Quality of Life for Participants

Description: Limited-resource families in both rural and urban settings require practical knowledge and skills to start them on the path to self-sufficiency. Changed food and nutrition-related skills are often the first step on this path. Collaborations and partnerships with local agencies strengthen this community effort.

In 2005, the Expanded Food and Nutrition Education Program (EFNEP) celebrated its 36th anniversary of service to limited-resource audiences. EFNEP utilizes family nutrition advisors (trained paraprofessionals known as FNAs) to teach a series of food and nutrition topics that lead to behavior change to limited-resource families in their homes or community sites in 15 Indiana counties. Topics include food safety, meal planning, food resource management, selection and purchase of nutritious foods, and nutrition for pregnancy, lactation, and early childhood. Lessons often include a food preparation activity to reinforce the principles taught. EFNEP works closely with agencies that serve this audience, including WIC, Food Stamps, Step Ahead, Healthy Families, Healthy Start, Head Start, Maternal and Child Health, and other local agencies.

Impact: 2,067 families, including 3,436 children (over 7,038 persons) participated in EFNEP in 2004-2005; approximately 15,430 lessons were taught as part of a series.
Ninety-one percent improved their intake of nutritious foods. Eighty-eight percent improved other nutrition practices such as reading nutrition labels and planning meals. Eighty-two percent improved their food resource management skills such as using a shopping list. Sixty-one percent improved at least one food safety skill. Fifteen percent improved their handwashing skills. Sixty-three percent improved their use of thermometers to measure doneness of meat, an increase of eight percent. Thirty-one percent of pregnant women increased their physical activity. Two thousand six hundred thirteen youth, ages 6-14, participated, an increase of approximately 900 from the previous year. Ninety-seven four volunteers assisted in the youth and adult program. Collaborations involved 32 WIC clinics and 16 food stamp offices. Five thousand nine hundred eighty-one dollars ($5,981) was contributed to EFNEP efforts by local agencies.
In response to the *2005 Dietary Guidelines for Americans, MyPyramid* and *MyPyramid for Kids*, all EFNEP curricula have been or will be revised. Training was conducted to make all staff

current on the new guidelines. Bilingual paraprofessionals in Lake and Marion counties as well as other FNAs continue reaching the Hispanic/Latino population. An additional person was hired in both counties The program for pregnant adolescents and limited resource mothers-to-be, *Have a Healthy Baby*, continues to show healthier babies as result of participation. *Safe Food and You*, food safety habits especially during pregnancy, to reduce risk of listeriosis is included. Over 13, 970 pregnant adolescents and adults have participated during the 15 year course of the program. Seven hundred twenty-six participants from 31 counties were involved in 2005. Funding from March of Dimes has provided *Have a Healthy Baby* video lessons and the Spanish version released in 2005. *Exploring My Pyramid with Professor Popcorn* continues to be utilized nationally. In Indiana, 9520 youth (an increase of 3500) in 297 groups (an increase of 100) representing 34 counties participated. Improvement was reported related to food selection, and food safety practices. The collaboration with March of Dimes to facilitate Indiana Folic Acid Council continues. Participant Comments: "I really enjoyed learning how to make new food that I did not think I would like, but I really did enjoy it" Another participant says she did not know too much about food safety. This was the most interesting thing that she learned because she did not know how long to keep food out, before putting it away. She never knew that food could grow bacteria just by sitting out to thaw. She was so excited to get the certificate and will use it with her resume to get a job at a restaurant. She said they will be interested to know that she is knowledgeable in food safety. "I bought everything I need and more by spending only $111 when I usually spend $200 per week"

Source of Funds: Smith-Lever 3(d), State

Scope of Impact: IN

Indiana Family Nutrition Program (FNP)

Description: Nutrition and health status are major concerns for all Americans. Years of research reveal a link between poor nutrition, lifestyle habits, and many of the chronic diseases that lead to illness and death in our society. These issues have an even greater impact on low-income individuals and families who often lack the skills and resources to select and acquire nutritionally adequate food. In addition, many of these individuals lack health insurance and are thereby unable to seek medical care. USDA and Indiana Family and Social Services awarded funds to the Indiana Family Nutrition Program in the amount of $1,765,501.00, with Purdue Cooperative Extension Service matching the funds with local and state dollars in support of nutrition education for food stamp program participants and potential participants. As a result of acquiring this funding, Purdue Cooperative Extension Service was able to provide nutrition education to current and potential food stamp populations in 62 Indiana counties in 2005. Individual and group educational programs are provided in home and community settings in the areas of basic nutrition, food safety, and food budgeting. The mission of FNP is to increase the ability of individuals and families with limited resources to utilize their food dollars and stamps appropriately and to provide a safe meal environment.

Impact: FNP assistants made direct contact with 71,022 individuals through home and group

visits, and 374,982 indirect contacts through the use of informational brochures, newsletters, telephone calls, and recruitment efforts in 62 Indiana counties. There was a 20.3 percent increase of participants who regularly stayed within a budget by planning menus and shopping skillfully, and a 28.1 percent increase in participants who saved money on food purchased for the month rather than running out of food and or money. There was a 28.8 percent increase of participants knowing how to use the Food Guide Pyramid to plan meals, and a 37.8 percent increase in the number of participants that knew proper serving sizes. There was a 24.9 percent increase in the number of participants that regularly ate five fruits and vegetables servings each day.

Source of Funds: USDA State Contract

Scope of Impact: IN

Exploring the Food Pyramid with Professor Popcorn

Description: Youth establish lifelong food, nutrition and physical activity habits during their early years. Overweight children and youth are much more likely to develop diabetes, high blood pressure, and serious orthopedic problems.

Exploring the Food Pyramid with Professor Popcorn (Professor Popcorn) is a curriculum for youth in grades 1-6. Originally written in 1993, it was extensively rewritten in 2002. With the release of the 2005 Dietary Guidelines for Americans and MyPyramid, revisions were made to the curriculum in 2005. Major concepts included in the curriculum have been linked to Indiana's health and science education standards. Topics include: MyPyramid; the Dietary Guidelines for Americans; the Fight Bac! Concepts of Clean, Separate, Cook and Chill; and finally, the importance of physical activity to health. Extension staff continue training via distance education since 2002 and begin teaching following that training. In some counties, teachers have been trained by Extension staff and together teach the program. Credit has been obtained from the Indiana Professional Standards Board for teachers.

Extension staff taught and provided evaluation data for the Professor Popcorn program in 34 Indiana counties. In 8 counties the program was taught only to grades 1-2; in 16 counties the program was taught only to grades 3-6; and, in 10 counties all grades were taught. Nine thousand five hundred twenty youth in 297 groups were taught the program; 5593 youth in 174 groups in grades 3-6; and 3927 youth in 123 groups in grades 1-2. These were all substantial increases from 2004.

Youth in grades 3-6 reported the following related to behavior change:
• 88% reported that they sometimes or almost always practiced one or more healthy food selection habits, 7% improvement was reported;
• 94% reported that they sometimes or almost always practiced one or more food safety habits, (10% improvement was reported);
• 96% reported that they sometimes or almost always practiced healthy physical activity habits, an increase of 2%.

Youth in grades 3-6 reported the following related to knowledge:
• 96% reported knowledge of healthy food choices and food preparation, an increase of 3%;
• 92% reported knowledge of safe food handling, (26% improvement was reported);
• 98% reported knowledge of the relationship of physical activity to health, an increase of 1%.

Youth in grades 1-2 reported the following related to knowledge:
• 95% reported knowledge of one or more nutrition, food choices and/or food preparation facts, (20 % improvement was reported);
• 84% reported knowledge of safe food handling, an increase of 4%.

Source of Funds: USDA EFNEP

Scope of Impact: IN

Dining with Diabetes

Description: In 2002, an estimated 317,000 people in Indiana had been diagnosed with diabetes. The costs of diabetes to the nation are nearly $100 billion a year. These include the direct costs of the care needed to treat diabetes, and the indirect cost in lost wages, lower quality of life and shorter lifespan. The average yearly health care cost for a person with diabetes is $10,071, compared to $2,600 for a person without diabetes. Recent studies have shown that with proper diet and modest, consistent physical activity, type II diabetes can be delayed, controlled or even prevented. The number of individuals who have this serious disease is growing rapidly and it is now considered by many to be an epidemic. Both the Center for Disease Control and the National Institute of Health estimated that 17 million Americans have this disease. Purdue Extension has included the Dining with Diabetes program as one of five target programs. Seventeen educators held programs in 18 counties and taught 243 participants in 2005. One reporting county indicated 62.5% of the participants learned how to reduce fat, sodium and cholesterol; 30% learned the importance of portion control; and 50% learned the difference among sugar substitutes. This program helps participants and their families gain an understanding of how to change their food preparation practices and eating habits to enable them to live a healthier life.

Source of Funds: Smith-Lever, State

Scope of Impact: IN

Key Theme: Birthweight

Have a Healthy Baby

Description: Low birthweight (LBW) and short gestational age are the two most important risk factors for infant health and survival in 2003. 7.9 percent of Indiana babies are born at low birthweight. Low birthweight infants were born to mothers age 10 to 17 at a rate of 9.2 percent.

African-American infants were born at 13.3 percent LBW. Twenty-eight percent of LBW births are associated with maternal smoking. In Indiana, 18.5 percent of the mothers smoked during their pregnancies. LBW babies are 64 percent more likely to attend special education classes than normal birthweight babies. LBW accounts for 10 percent of all health care costs for children. The lifetime medical cost of caring for a premature baby is conservatively projected to be $500,000 per case. More than 60 percent of private-sector preterm births and LBW cases are preventable.

Pregnant teens and adults in homes, schools, community centers, and WIC clinics participated in the "Have a Healthy Baby" program. This prenatal nutrition education program consists of six lessons emphasizing nutrition and lifestyle choices—smoking, drinking, and drugs. It is a research-based curriculum taught by trained, caring professionals. It is a highly visual, interactive, and complete curriculum, including: Safe Food and You (food safety during pregnancy) , a DVD created in 2005, Video lessons for use in physician offices and clinics – created 2003, Como Tener Un Bebe Sano (video lessons for the Latino community - 2005); The curriculum was revised and updated for Indiana EFNEP -2005 Throughout the state of Indiana - more than 239 middle and high schools, community agencies and sites. Thirty-five other states have purchased the curriculum. It has been replicated in Iowa, Kansas, and Oklahoma.

Impact: Thirty-one counties provided the program, teaching 726 pregnant adolescents and at-risk adults. Data was obtained on 544 live births. Sixty-two percent of smokers report decreased tobacco use. Fifty-three percent achieved appropriate weight gain. Forty-seven percent of participants initiated breast-feeding. Decreased neonatal mortality—one deaths was reported—along with decreased days of hospitalization with subsequent savings; decreased long-term care costs due to healthier babies; significant increase in both nutrition knowledge and improvement in intake of healthy foods.

Since program initiation, over 13,970 pregnant adolescents and at-risk adults were taught; fewer low birthweight infants, decreased neonatal mortality, and decreased days of neonatal hospitalization were reported. There was significant increase in nutrition knowledge and improvement was shown with the intake of healthy foods. WIC participation after birth showed a significant increase.
Participant comments about the changes made were as follows:

- "Stopped smoking as much, stopped eating as unhealthy as I was" - 17 year old in central Indiana.
- "I don't eat as much uncooked food like bologna and I am eating more veggies"- 27 year old Latino woman in southern Indiana.
- "I have stopped drinking so much pop." - 16 year old in central Indiana.
- "I have changed my mind about breastfeeding."- 23 year old in eastern Indiana."

We continue to partner with WIC, March of Dimes, Healthy Families, and the Division of Family and Children.

Source of Federal Funds: USDA, March of Dimes, State
Scope of Program: IN

Goal Four. Greater harmony between agriculture and the environment. Enhance the quality of the environment through better understanding of and building on agriculture and forestry's complex links with soil, water, air, and biotic resources.

Overview

Purdue Extension provides education and outreach programs that allow the public to reach sound judgments regarding the use of natural resources. The quality of air, soil, and water resources is critical to the overall well being of the entire ecosystem of the state. Farmers, homeowners, public officials, and all citizens need to be aware that many of their decisions and activities affect the quality if the environment and the natural resources they use. Purdue Extension provides education and outreach programs that allow the public to reach sound judgments regarding the use of natural resources. Purdue Extension is developing and delivering educational information that provides all Indiana citizens the opportunity to analyze and adopt useful emerging technologies, which will maintain family farms, protect the waters of the state, and provide an acceptable wildlife habitat for future generations. A large part of Purdue Extension's efforts is to make farmers and the general public aware of the issues and consequences, from lack of action, to the land and the environment. During FY 2005, Purdue Extension devoted to environmental stewardship issues 2,102 contact days and made 39,784 direct contacts.

Purdue Extension County Educators have worked with county officials to address land use issues when planning the growth and development of Indiana counties. These efforts not only involve training county officials in planning and zoning for residential and industrial growth, but also involved training them the need for protecting critical natural resources from encroachment by development pressures, and teams the planning and zoning officials with conservation agencies that provide technical support on natural resource planning and strategies to protect these resources from being destroyed by development of the lands. In FY 2005, Purdue Extension spent 628 contact days on Land Use issues, making 10,784 direct contacts.

While manure management and soil erosion, with their related water quality issues, are of primary concern to the agriculture and forest producers, residential waste and water pollution are the issues that most affect the non-farming population of Indiana. Purdue Extension has focused its research and educational outreach resources to address the issues that affect both the farming and non-farming citizens of Indiana. The outcomes of these efforts have resulted in an increased awareness of these environmental issues, and through a combination of extension and research, significant progress is being made with educational programs.

Purdue Extension is in the forefront of environmental educational needs to address the issues facing the agricultural community of the state. While we have initiated several new programs and experienced some short-term impacts of knowledge gained and human behavioral change, we have also accomplished some long-term goals and are noticing medium and long-term impacts of implementing new environmentally sound practices that will lead to a cleaner

environment. Several examples of the results of these efforts are given below in the key themes section.

Resources: Approximately $ 308,447.41 and 6.8 FTEs have been invested in Goal 4. This is a best estimate and these are not presented as auditable numbers.

Key Theme: Forestry Resource Management

Emerald Ash Borer Awareness

Description: Emerald ash borer (EAB), an exotic pest that could eliminate billions of native ash trees from North America, was first reported in Indiana in Spring 2004. With EAB now present in 6 townships in Steuben and LaGrange counties, Indiana citizens have good reason to be concerned. The national EAB Science Advisory Panel determined that the best strategy to protect North America's ash resource from the pest is to aggressively slow its spread. Natural spread of flying beetles can be slowed by destroying infested ash trees as they are found along with all other ash trees within a half mile of the find. Artificial spread of the infestation can be accomplished by stopping the moving of ash firewood and other ash products out of known infested areas. To facilitate this policy in Indiana, Purdue Extension needed to significantly boost public awareness of EAB, thus equipping the public to actively participate in detection and eradication of EAB in Indiana. As active members of the Indiana Exotic Forest Pest Advisory Committee and the EAB Tri-State Communications Committee (Ohio, Michigan, Indiana) we formulated clearly defined objectives for our educational program. The first objective was to make people care about ash trees and be able to recognize EAB and its injury. The second objective was to involve the public in the search and reporting of suspicious looking ash trees, or ash firewood. Last and probably most importantly, was to convince the public that they could help stop the spread of EAB by changing their practice of bringing firewood along on camping trips. In addition to conducting a series of meetings with the affected public, various green industry and garden groups, and public educators, we launched a media campaign that included radio spots highway billboards and targeted audience education sessions. As infestations of EAB expanded into LaGrange and Steuben Counties, Purdue Extension joined the Indiana Department of Natural Resources (IDNR) and USDA-APHIS to conduct town meetings. At these meetings the public was informed of the consequences of EAB detections and how they could work with regulatory officials to minimize losses incurred from ash tree removal by entering into compliance agreements. The green industry (Indiana Nursery and Landscape Association and Midwest Regional Turf Foundation), Master Gardener (Indiana and Illinois) groups, and public educators school groups (Hoosier Association of Science Teachers Incorporated and County Extension Educators) were informed about the EAB in their state, county and regional meetings. To facilitate the ability of these attendees to train their clients, communities, and students, we provided them with EAB-themed literature and slide shows. To consolidate reporting of EAB incidents, all individuals were directed to a toll free number staffed by IDNR and campus personnel. We also directed all participants to our regional and state EAB Web sites to gain access to information on the rapidly changing status of the EAB distribution. To reach people

most likely to move firewood, we launched our media campaign to coincide with the start of the camping season. The Governor of Indiana joined the governors of Michigan and Ohio in issuing an official proclamation naming the week of May 22-28 as Emerald Ash Borer Awareness Week. In addition, thousands of pieces of EAB-themed literature were distributed at the main gates of Potato Creek State Park and Chain O' Lakes State Park, thus bringing EAB awareness directly to an important audience. The Fireside Program was conducted for 50 campers at Turkey Run State Park on invasive species in Indiana.

Impact: Many private campgrounds, especially in NE Indiana, no longer allow firewood of any kind to be brought to campgrounds. Some state parks such as Pokagon now telephone campers from Zip codes where EAB is quarantined who have made reservations at the park's campground, telling them not to bring firewood with them. EAB literature and information is given to all campers at the gate. EAB information is part of the naturalist curriculum around the state. At least eight RV dealerships now clearly display EAB posters to alert their customers about the issues. During town meetings, over 50 compliance agreements were signed enabling citizens to extract some lumber or firewood value out of their trees before they were destroyed. The emerald ash borer has already eliminated over 12 million ash trees in the United States. In Indiana, timber value of woodland ash has been estimated at $500 million and the cost of removing and replacing ash trees lost from urban forests could cost at least $300 million. As a result of their work Purdue Extension and Indiana Department of Natural personnel received more than 300 inquiries about emerald ash borer and over 10,000 website hits. Through the use of compliance agreements, residents of EAB infested areas were able to recoup thousands of dollars from ash slated for destruction

Source of Funds: Smith-Lever, State

Scope of Impact: IN, OH, MI

Key Theme: Hazardous Materials

HCSWMD and Purdue Extension Services Household Hazardous Waste Collection

Description: Household Hazardous Waste (HHW) is an ongoing problem and threat to water quality, soil quality, and quality of life everywhere. HHW Day allows the public to properly dispose of waste protecting the quality of the environment and health of the community. Purdue Extension in association with Hancock County Solid Waste District (HCSWMD) advertised and hosted the event at the City of Greenfield Parking lot. It was open to residents of Hancock County. Bee Environmental was contracted to collect and dispose of waste streams in the county. Volunteers outside of HCSWMD and PES worked the event. Over 180 residents of Hancock Co. attended the event and tons of HHW was removed from the community for proper disposal.

Impact: Extension through HCSWMD was able to educate the public about chemical disposal, reduction of use, and recycling. County Government as well as PES engaged the community by educating the public about proper waste disposal and recycling, then organizing and advertising the event to the public of Hancock County. Over 180 households attended the event. Tons of household chemicals, mercury, pesticides, tires, oil, batteries and other chemicals were collected and properly disposed of or recycled.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Land Use

Land Use Updates

Description: Recent growth in Bartholomew County has placed pressures on its land resources. Issues such as balancing growth and farmland protection challenge local decision makers and citizens to seek solutions to these issues. These issues were raised during local Plan Of Work input meetings and the need to update the comprehensive plan and its ordinances. Ordinances that are effective and implemented by the community will protect the natural resources, allow for economic growth, and promote the quality of life that strong communities need for their future growth and success. Purdue Extension conducted four statewide two-way video programs through IP video systems. The first two topics in 2005 focused on training planning commission and Board of Zoning Appeal members on their roles and responsibilities. The other two programs focused on the process of updating or developing a comprehensive plan.

Impact: 466 participants have attended the four sessions at 23 viewing sites around the state. 97% of surveyed individuals indicated they would recommend this program to others. 74% of those surveyed indicated they will use something in their local community as a result of what they learned from this program. Many attendees feel more confident in their duties as a plan commission and board of zoning appeal members. They indicated that they will be better able to address issues more professionally and legally defensible. Attendees also indicated they realized the importance of involving the public in a comprehensive planning process. They gained ideas on how to increase public involvement in the comprehensive planning process. The attendees learned how the comprehensive plan can serve as their guide for their community development process.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Natural Resources Management

Flowers Lure Good Bugs to Kill Bad Bugs in Landscape

Description: Implementation of biological control in urban landscapes is hampered by lack of information on how to bring natural enemies into the urban matrix. A Purdue Extension Specialist planted flowering plants in an ornamental landscape to determine how they affect the abundance of beneficial insects. The experimental landscape contained a central bed of winter creeper euonymus and either low or high densities of four species of perennial flowering plants that were planted through wood mulch. Control plots included only mulch. The four perennials we used included white clover, euphorbia, coreopsis, and goldenrod. Insect samples were conducted when flowers were in bloom and when they were experimentally manipulated to remove blooms

Impact: An abundance of parasitic wasps and total natural enemies were found to be positively correlated with the biomass of Euphorbia polychroma within plots, and that of all flowering plants combined. This effect occurred, to a lesser extent, when flowers were removed. Results have been published in the International Journal of Biological Control.
These findings provide clear evidence about how actions can be taken to conserve the beneficial insects that reduce the abundance of pests in the landscape. They also provide added motivation for individuals to plant flowers in landscapes.

Source of Funds: Smith-Lever, Hatch, State

Scope of Impact: Nationwide

Key Theme: Pesticide Application

Reducing Atrazine in Indiana Surface Water

Description: Atrazine is the number one corn herbicide used by Indiana farmers. Corn growers appreciate its low cost and effectiveness in controlling weeds. According to Indiana Agriculture Statistics, in 2003, atrazine was applied to 83% of the corn acreage in the state. Because of the large volume applied and the solubility of atrazine, atrazine was detected in 47% of public surface water supplies from 1992-2003. EPA implemented a five-year monitoring program in 11 Indiana watersheds as a condition of re-registration for atrazine. Failure to lower atrazine levels in surface water after the five years could result in atrazine being banned or further restricted in that specific watershed. Farmers are required to be certified before purchasing and applying atrazine, a restricted-use pesticide. To retain their pesticide certification farmers attend recertification programs hosted by Purdue Extension educators. At recertification programs, farmers learned about the atrazine monitoring program and the need to prevent atrazine from entering Indiana surface water. Extension educators and university specialists explained practices

that slow water and atrazine movement, such as reduced tillage, field drainage tiles, and delaying application before a rainfall event. Presentations addressed the specific setback distances listed on the atrazine label for application and mixing of atrazine near surface water and wellheads. Farmers were encouraged to implement weed control options that reduce atrazine applications, such as substituting products, tank mixing with atrazine, incorporating atrazine and using atrazine postemergence. The atrazine presentation was heard by 2,887 farmers from January to June, 2005.

Impact: A total of 1,987 farmers (70%) responded to survey questions regarding their atrazine use and practices. When asked their level of concern of atrazine in surface water prior to the program, 35% thought atrazine was a major risk. After the program 66% categorized atrazine in surface water as a major risk. Atrazine is an important herbicide to 94% of the farmers who completed a survey. Of the farmers who use atrazine, 70% estimate they would lose 10 to 20 bushels/acre in corn yield if they could not apply atrazine. With corn priced at $2.25/bu that would be a loss of $22.50 to $45 per acre with a statewide loss of between $130 to $261 million. Over 90% of the farmers that use atrazine estimated their cost for corn herbicides would increase $4 to $10 per acre. Statewide this increase in cost would result in corn producers paying $23 to $60 million dollars more for weed control based on 5.8 million corn acres. Farmers were asked to select practices they would adopt in the areas of regulation, crop management, and environmental protection to reduce atrazine movement to surface water. The 82% of those surveyed who farmed a field at risk to off-site atrazine movement selected:
closer attention to following setback distances listed on label - 43%
establishing grass filter strips around surface water - 35%
reducing rates of atrazine by tank mixing with other products -32%
discontinue spraying around tile drainage outlets -32%.
The top choices reflect practices from the three categories presented during the atrazine program.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Soil Erosion

No-till Corn Adoption in Clay County

Description: More than one half of Indiana's 23 million acre land area is comprised of annually planted cropland. Based on 2004 Indiana Transect survey data, 39 percent of Indiana’s 5.8 million acres of corn is eroding at a rate faster than natural processes can replace soil loss. In Clay County, 53 percent of its 63,900 acres of corn is eroding at a rate faster than natural processes can replace soil loss. Excessive soil erosion on cropland is a result of practices leaving soil unprotected; either by tillage that buries protective crop residues or excessive land clearing that removes vegetative cover. The long-term costs of erosion to Indiana include deteriorated

water quality, loss of soil productivity, reduced reservoir and water channel capacities, and reduced property values. No-till or other minimal tillage practices had been adopted for the majority of soybean acreage, but the issue of conservation practices minimizing tillage practices on corn acres remained. An ongoing case study comparing counties with similar soils and very different no-till corn adoption rates was updated to illustrate that no-till is not a yield drag for corn production and used at private applicator programs. Though after 2004 planting decisions were made, a spring listening/discussion session was coordinated jointly by the Clay County SWCD and Purdue Extension office allowing farmers to personally share no-till corn success strategies. Input received from the spring 2004 meeting suggested a summer farm tour of no-till corn operations and combining a private applicator session with the program. Working with the USDA Natural Resources Conservation Service Conservation Tillage Coordinator, cover crop management information for annual ryegrass an easier to manage cover crop was made available to producers at the private applicator session. A follow-up winter meeting was requested by the farmers and conducted to discuss the 2004 growing season results and outcomes from tour stops. During 2005, at least five newspaper columns focused on no-till and ryegrass cover crops. A summer field day hosting 60 individuals with cover crop, no-till management sessions and tips was conducted. Coinciding with the field day was a USDA Conservation Security Program (CSP) contract signing ceremony. CSP rewards producers who use no-till and is a further incentive that will increase no-till acres. A total of 27 workdays were focused on this effort.

Impact: There is no better practice to reduce soil erosion than utilizing conservation tillage, in particular no-till, where a minimum of 30 percent soil cover is maintained at the completion of seeding. Conservation tillage adoption for corn has been only about one fourth that of soybean by producers. Through demonstrating economics and techniques, conservation tillage levels in corn can and will continue to trend upward. Specifically for Clay County no-till corn adoption increased 5 percent from 15 percent of all 2003 corn acres to 20 percent of all 2005 corn acres. No-till corn adoption in Clay County increased five percent from 2003 to 2005 from 15 to 20 percent, respectively of all corn cropland. Compared with two years ago, this represents no-till conservation practice on nearly an additional 3,200 acres. For reference, no-till corn was only 9 percent of all 1998 corn acres and the 2005 adoption rate was the highest ever for the county. No-till will reduce drought risk, reduce annual soil erosion, and reduce input costs. Long term continuous no-till will improve soil health. Since soil is the greatest contaminant of surface water by volume, any measure to reduce soil erosion benefits all people of Indiana.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Water Quality

Soils and Septic Systems Workshop

Description: High turnover rates among county health department staff coupled with diverse and sometimes inadequate soil science background leaves many environmental health specialists confused when it comes to interpreting a soil report for a septic system. For the past five years, Purdue Extension has been hosting two Soils and Septic Systems Workshops annually at different Purdue Agricultural Centers.

Impact: In the spring of 2005, 90 county environmental health specialists, state department of health staff, septic system installers and professional soil scientists participated in Soils and Septic Systems Workshops held at Penney-Purdue Agricultural Center and Davis-Purdue Agricultural Center. Participants learned how to identify soil physical properties and morphologic features, and how these features relate to water movement in soils. In the two-part lecture and hands on field exercise, participants also learned how to identify soil properties and how these properties relate to wastewater dispersal in septic systems.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Responsible Atrazine Use

Description: Indiana regulations require private pesticide applicators maintain certification in order to use restricted use pesticides. Atrazine is an important corn herbicide; however, it has also been detected in public surface water supplies, thus the need to lower atrazine levels in surface water. Of the 34 farmers responding to the survey at a PARP program in Cass County, 96% indicated that atrazine-containing products were important/very important to their weed management programs. The availability of atrazine for use as a corn herbicide may be impacted if surface water levels are not reduced in the next 5 years. Pesticide Applicator Recertification Program (PARP) sessions were held targeting private pesticide applicator's needing recertification credits. "Atrazine and Water Quality" was a primary topic, along with others such as "Soybean Rust Identification and Control", "Soybean Aphids Update", and "Reading a Fungicide Label". Purdue University Specialists explained the current atrazine monitoring program including setback requirements on atrazine labels, and discussed ways atrazine can move into surface waters. Purdue Extension publications "Atrazine Use and Weed Management Strategies to Protect Surface Water Quality" and "Atrazine and Drinking Water Concerns" were distributed to the pesticide applicator's attending the PARP sessions to use as references.

Impact: During the past year, two Pesticide Applicator Recertification Program (PARP) sessions were offered to private pesticide applicators, attracting 93 participants. Pesticide applicators learned about Indiana's atrazine monitoring program and the need to reduce atrazine levels in the

state's surface waters. When the 34 participants that responded to an evaluation survey were asked about their level of concern regarding atrazine levels in surface water, 18% indicated "very much a risk" prior to the program, with 71% categorizing atrazine in surface water "very much a risk" after the presentation. The evaluation survey also revealed that farmers felt they would lose yield if they could not apply atrazine. Of the farmers that use atrazine, 64% estimated a yield loss of 5 to 10 bushels per acre, and 37 % estimated an even higher yield loss of 15 to 20 bushels per acre. Pesticide applicators (23 of the 34 – 77%) responding to the evaluation survey further estimated an extra $8 - $10 per acre cost for weed control in corn if they could not use atrazine. The evaluation survey asked the pesticide applicator's responding to the survey to select practices they would adopt to reduce atrazine movement to surface water in their most at risk fields. The practice of establishing grass filter strips was selected the most (53%) with 39% indicating they would look into financial assistance offered for filter strips through CRP. The practice of following setbacks on the label was selected by 48% of the respondents, and another 45% indicated they would not spray around drainage tiles. The 16 practices listed that the respondents were asked to select from were in the areas of regulation, crop management, and environmental protection. In Cass County, Indiana, approximately 95, 000 acres are planted to corn, thus there is the potential to reduce yields by an estimated 950,000 bushels, if using the 10 bushel per acre estimate. Combine that with an estimated $8 to $10 extra cost in weed control, financial loss to the county's farmers could amount to approximately $2.9 to $3.1 million (figuring corn at $2.25 per bushel) if atrazine was not available for use in controlling weeds in corn.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

Key Theme: Wildlife Management

Master Naturalist Program Clay County

Description: Many individuals are no longer connecting to the landscape and nature. This program provides a means for individuals to learn and interact with natural resources. With recent cuts in state and local spending for parks and recreation, the community service component of the Master Naturalist program helps to meet local needs where participants match each hour in class with an hour of community service. The community service is further enhanced such that individuals are to be sharing the information learned during the program. The Extension Educator held 8 sessions (one daytime field day and 7 evening sessions) related to broad range of natural resource topics, then he setup a volunteer community service component of program. The Educator served as a speaker for the soil and water session and cooperated with Clay County SWCD and Sycamore Trails RC&D to make this program succeed.

Impact: Based on surveys collected at the last event, a total of 33 acres of trails will be enhanced or developed at McCormick's Creek State Park (ADA trail and the Clay City High

School nature trail). Timber stand improvement will occur on 40 acres, and wetland and backyard habitat improvements will occur on 35 acres. Wildlife habitat improvement efforts will be implemented on 187 acres. Three individuals stated they would be volunteering community service for the Friends of McCormick's Creek State Park. One teacher indicated that materials and information obtained from the Master Naturalist program would be used for 200 youth, grades 6 through 8. Two others indicated that outdoor classrooms would be constructed. Through the train the trainer approach, more than 200 youth will now be reached annually due to educators who will use the program materials and activities in the class room. Recreational and natural areas open to the public will also benefit at one state park and three school trails or outdoor classrooms.

Source of Funds: Smith-Lever, State

Scope of Impact: State Specific

GOAL FIVE. ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR AMERICANS. Empower people and communities through research-based information and education to address economic and social challenges facing our youth, families, and communities.

Overview

Parenting

Families are at the very heart of the strength and competitiveness of our nation. Indiana county-based needs assessments conducted in 1998 strongly indicated that increasing parenting skills was the topic of highest priority for Extension programming. Purdue Extension continues to respond to this high priority. The Strong, Resilient Families Plan of Work Issue is responded to with high priority. A diversity of programming was offered to strengthen families through the learning and use of positive personal development and relationship skills and teaching parents to know and use positive parenting practices. Over 132,693 direct contacts have been made with programming focused to strengthen families in FY 2005. These contacts represent 2,134 contact days of programming effort.

Child Care and Dependent Care

Family child care providers and lead teachers in child care center settings in Indiana are required to obtain the Child Development Associate (CDA) Credential from the National Council for Professional Recognition in Washington, DC, to meet state child care licensing regulations. Purdue Extension provided classes for child care providers in 13 counties in preparation for the national CDA assessment. A total of 82 providers participated in CDA classes and advising, and their training will potentially impact over 1,050 children in their care.

Fire Safety

"Do's and Don'ts at the Gas Pump: Static Electricity Fires—How to Prevent Them" was developed after an Extension educator experienced a refueling fire. This educational video has reached thousands nationally and internationally. Gas pump fires have decreased by 70 percent in one state alone.

Financial Management

Indiana financial institutions report that 15.5 percent of Hoosier adults can't get a checking account because they mismanaged finances in the past. Purdue Extension educators in Johnson and Marion Counties, along with other educational partners, work with people to teach them proper checking account use. To date, more than 275 people successfully completed the course and opened checking accounts, potentially saving themselves $6,800 in check-cashing and money-order fees.

Youth Development

Purdue University, through its 4-H Youth Development Program, reached 329,842 youth throughout Indiana during FY05. We continue to focus on new audience development to reach youth beyond the club program in order to meet youth needs and build youth competencies relevant to enabling them to become successful adults. Much of our success is due to the outreach being done county by county in collaboration with other organizations. We have also begun working to establish 4-H after school Clubs by working with a variety of organizations that provide ongoing after school child care. Extension staff in Indiana has reported 9,743 days of activity, with 361,283 direct contacts addressing issues related to youth development.

Examples of the success of 4-H Youth programs will be provided in the Key Theme section of Goal 5 accomplishments. Briefly, our programming is delivered by three different methods which are club programming, school enrichment programming and community programming (usually in collaboration with other community groups and organizations). During the past year, we introduced nearly 51,148 new youth to the Indiana 4-H Program and have experienced significant growth in organized club efforts for the first time in several years. The alignment of our 4-H youth development curriculum with state teaching standards is now standard procedure in all new curriculum produced and adopted for use in the Indiana 4-H Program. This has afforded the opportunity to strengthen existing, and to build new relationships with public school systems.

Resources: Approximately $ 4261,444,50 and 92.9 FTEs have been invested in Goal 5. This is a best estimate and these are not presented as auditable numbers.

Key Theme: Fire Safety

Safety at the Gas Pump

Description: The “Do’s and Don’ts at the Gas Pump” program continues to be one of the most popular and widespread educational programs. Since 2003, the program has been implemented in over 22 counties, several conferences, and has even been used by the Ohio and North Dakota State Extensions. From 2/03 to 2/06, there were a total of 1,120 Indiana participants! The “Do’s and Don’ts” program was designed to teach participants how to avoid dangerous static electricity build up, and potential electrical fire when refueling a vehicle. Cathy Burkett, a retired CFS Extension Educator, created the program in an attempt to minimize risk of injury to others after her own unfortunate personal experience with static fire. Reviewed and endorsed by the petroleum industry, the program includes a variety of teaching tools such as videotape, PowerPoint presentation, and discussion guide to inform participants of safe gasoline handling and proper safety procedure in refueling. Program participants also complete pre and post-tests before and after viewing the program to assess knowledge gained.

Three manufacturers of gas pump equipment distributed more than 25,000 copies of the Purdue video on CDs and DVDs. They have translated the videos into Spanish and French for use in Mexico, and Canada. The latest statistics indicate that 3,000 gas stations in Oklahoma, 3,000 stations in South Carolina, and more than 12,000 stations in Texas have received copies. Ohio has made it mandatory that every driver's education student watch the video. OPW Fueling Components sales reps have used the video in more than 400 presentations to oil companies. Leadership from the Petroleum Equipment Institute indicates gas pump fires in one state have decreased by about 70%, in the past year, and he attributes at part of that decline to the video.

Source of Funds: Smith-Lever, State

Scope of Impact: IN, National, Mexico, Canada

Key Theme: Child Care/Dependent Care

Indiana Non-Formal Child Development Associate Credential Training Initiative

Description: Since June 2001, obtaining the CDA (Child Development Associate) credential is a requirement for family child care providers and lead teachers in child care center settings in order to meet state child care licensing regulations. Because child care providers work long hours (usually 6 a.m. to 6 p.m.), time available for formal class work is limited as well as their ability to reasonably travel to one central location for class instruction. The Purdue Extension CDA program included 120 classroom hours in the form of three 40-hour courses, plus 24 hours of advising in preparation for the national CDA assessment. The program was began in January 2005 and continued through September 30, 2005.

The CDA classes were offered to child care providers in following 13 counties, several not currently having access to other formal CDA training: Cass, Clark, Clinton, Floyd, Hamilton, Harrison, Howard, Jasper, Madison, Tippecanoe, Tipton, Washington, White.

Impact: Seventy-four child care providers needing the CDA credential participated in some or all of the entire grant-funded CDA program. In addition, eight (8) child care providers were also involved in CDA classes outside the grant (the grant stipulates no more than 5 child care providers from any one setting can be included on the grant). All 82 class participants had at least a GED or high school diploma but almost no other educational training prior to participating in the CDA classes. A five-question, open-ended evaluation instrument was administered at the beginning of each class period based on the previous class's instruction and experiences. The questions were designed to reflect changes implemented since the previous class in the areas of attitude, knowledge gain, skill, and behavior. Content analysis of the returned self-report candidate evaluations is still underway, but preliminary results indicate that candidates receiving CDA training were significantly influenced by the CDA classes. Candidates report a more positive professional view of themselves changing their views about young children and their families, learning new knowledge and skills, changing their child care

environments to be more closely related to developmentally appropriate practices, and changing their interactions or behaviors with young children. In addition to qualitative self-reported data, pre- and post-tests based on specific curriculum content were administered at the beginning and end of each curriculum topic area studied. Content analysis of this data is still underway as well—a summary evaluation report of all findings (qualitative and quantitative) will be available in October 2005 after completion of the classes in September. Individual candidate comments to date have also indicated positive changes and a high level of satisfaction with the CDA courses and their local delivery.

The partners were: Indiana Association for the Education of Young Children (IAEYC) and the Indiana Child Care Fund Board.

Source of Funds: Smith-Lever, IAYEC, Indiana Child Care Fund Board Grant, State

Scope of Impact: IN

Key Theme: Parenting

Parenting Programs (Active Parenting, Parenting Piece by Piece, Parents' Night Out)

Description: Changing family forms and situations are leaving families looking for new skills and resources. Indiana county planning committees have expressed concern that many parents lack a sense of direction and optimism, skills for dealing with children and parenting responsibilities, and programs and services that will support them. Many counties in the state of Indiana provided parenting education programs to help provide the information necessary to develop these skills and four counties assessed the impact and submitted data from these programs measuring their effectiveness with adults, children, and families. This report lists those impacts.

Extension educators from 4 counties (Tippecanoe, Daviess, Warrick, and Jackson) delivered Active Parenting, Parenting Piece by Piece, or Parent's Night Out. Purdue Extension Parenting Program Evaluation Response (PEPPER) forms were distributed to the people attending the programs both before and after the program. A total of 109 pre and post forms were returned (100 pre-tests and 67 post-tests). 58 pre- and post-tests could be matched to assess change. Of the respondents, 35.2% were male and 64.8% were female. One hundred four indicated their age in the form. Among them, 30.8% were 18 to 24 years old, 27.9% were from 25 to 30 years, 26% were between the ages 31-40, and 8.7% were from 41 to 50 years. A small number (1.9 %) were between 51 to 60 years and 4.8% were under 18 years old. More than half of the respondents (60%) indicated that their children were living with them. Most of the children were under 18, while 38 of them were 18 and older. The distribution was fairly even across the childhood life span: 38 children were 2 years old or younger, while 32 were between 3 to 5 years, 21 were between 6 and 8, 19 were in the age range of 9 to 11 years, 17 were from 12 to 14, and 10 children were from 15 to 18.

In general, there were significant improvements in the feelings of the parents about being parents. After the programs, the respondents felt more confident in their parenting skills. Specifically, they were more likely to say *"I can do things as well as other parents"* (p=.001), "*For the most part, I am happy with my parenting"* (p=.027), and *"I can list 10 things that I can do well as a parent* (p=.001). In giving themselves a grade as a parent, there was again a significant improvement that can be noted (p=.001). Their feeling good about their parenting slightly improved after participating in the program but did not meet statistical significance. Overall, there were changes in the self-descriptions of these parents from before the program to after participating in it. In general, more participants felt more positive feelings of being patient (from 58% to 74% of them), understanding (from 73% to 83%), loving (from 92% to 97%), and fun (from 77% to 85%). Supporting this result, there were fewer participants who felt negative emotions about being parents like feeling frustrated (from 43% to 38%), and impatient (from 24% to 21%). It can also be noted that there was a slight increase of number of parents who felt angry from the beginning of the program (5%) until after the program (9%), and for those who became more strict (from 33% to 38%). Their feelings of happiness and at a loss as parents remained the same from pre to post test.

Of the 51 respondents who responded to the question, "How much new information did you learn?" More than half of them reported that they have learned "lots" (68.6%), while 27.5% said they learned "some" new information with this program, and 3.9% said they learned a little. Some of the more common items listed as what they learned were better discipline techniques with their child/ren, better relationships with them, how to understand the children better, and dealing with personal issues.
Examples were: 1. How to better understand my children's feelings. 2. About different ways to go disciplining, self respect, caring, and loving your child in every way. 3. I learned how to deal with certain issues (finances). 4. Discipline comes from discipline, modifying behavior, anger, conflict and a lot of things to do with my kids that's fun.

Of the 51 who answered the question *have you changed your behavior because of the program,* more than half, 62.7%, stated that they "definitely" changed their behavior after the program, 25.5% said they "maybe" changed while only 11.8% said that they did not change at all because of the program. Themes in their behavior change included more positive ways in relating with children, especially in understanding them and also handling stress better. Examples were: 1.Praising myself, helping my child with learning but at her level rather then wanting her to do something she isn't ready for. 2. I look at the problems that my child and deal with it more positively. 3. I am not as frustrated and I focus more on the situation instead of the stress I am feeling. 4. I am being able to relieve stress. I am able to feel good about myself & learning how to deal with my kids better.

Regarding specific topics three counties (Daviess, Warrick, and Tippecanoe) participated in handing out and returning inserts of the PEPPER form.

- Child development: The child development items showed slight improvements in reports of providing their children with age-appropriate toys and starting to do new things based on

their children's ages. However, there was a significant decrease in agreement with thinking that their children understand a lot for their age (p= .03) and disagreement that they could list 5 new things that their children learned in the last month (p=.019). Although this appears to be negative, it may be that the program helped them understand their children more realistically.

- Discipline: In the discipline segment of the evaluation, there was a significant increase in spanking behavior reported from pre test to post test (p=.017) and also a decline in frequency in changing a rule because their children changed (p=.007). Again, this may indicate an increase in understanding of parenting and also an increase in comfort in reporting actual behavior.

- Praise: Of the matched sets that measured the praise (positive parent/child interaction and nurturance of the child) aspect of the program, there were significant declines in the frequency of the praising behaviors as reported by the participants: *I listened to my child talk about his or her feelings* (p=.014), *My child shared ideas with me* (p=.039), and *I used new ways to tell my child I was proud of him/her* (p=.013). The *yelling at my child* also significantly increased from pretest to posttest (p=.026). Again, it is possible that this result is related to increased comfort with honest reporting. It would be important to measure results in additional ways to assess this.

- Stress: Stress was also measured in the inserts. From the results, it can be seen that there are slight improvements in their feelings that they needed help in their parenting, changing something to reduce stress, and counting up to 10 when they felt stressed. The parents also felt more at their wit's end after the program, more yelling to blow off steam, and breaking something when they are stressed. All these changes however, did not reach statistical significance.

Source of Funds: Smith Lever, State

Scope of Impact: IN, National, International

Key Theme: Family Resource Management

"Get Checking™"

Description: Indiana financial institutions report that 15.5 percent Hoosier adults can't get a checking account because of previous mismanagement. In Indiana, individuals without checking account access pay and average of $400 each year to cash checks and purchase money orders. Banks often report checking account abuse to ChexSystems, a consumer reporter agency that collects the information and shares it with other financial institutions. ChexSystems reports are maintained for five years. During that time, most banks refuse to open an account for the individual.

Purdue Extension coordinated and led a group of educators who used a University of Wisconsin Extension program, "Get Checking," to teach people the basics of checking and savings account management. After successfully completing the program, participants were awarded a Get Checking Certificate that allowed them to open a checking account at participating financial institutions.

Throughout Indiana, 581 consumers took part in the program and 503 of them successfully completed the course. To date, 276 of those individuals have used their certificates to open a checking account. Participants have one year to use their certificate because it's possible that they may need to repay debts related to a previous account. The program potentially saved participants $6,800 annually in check cashing and money order costs. Those savings, over the five-year period that a report stays in ChexSystems, would total more than $1 million.

Source of Funds: Annie E. Casey Foundation, Smith-Lever, State

Scope of Impact: IN

Key Theme: Leadership Training and Development

Adult Volunteer Development

Description: The 4-H Youth Development Program is dependent upon volunteers to effectively deliver programming to youth. There is a need to provide the 4-H volunteers with the opportunity to develop knowledge, skills and competencies.

Impact: A variety of state, local and regional training opportunities were organized to target volunteer skill and competency development. Over 1,000 volunteers participated in these sessions that ranged from a focus on positive youth development, specific subject matter areas, organizational issues and 4-H policies and procedures, to youth/adult partnerships. An overwhelming 96% of the participants indicated they understood the importance of positive youth development as they work with 4-H members and their families. Over 90% of participants indicate increased confidence in their individual, volunteer role. Additionally, 75% of the volunteers indicated they would incorporate materials they gained from these opportunities into their ongoing 4-H program for which they provide leadership.

Teen Leadership Development

Description: Purdue Extension’s history of delivering educational programs that help build healthy organizations and communities extends not only to adults, but also to youth audiences. A variety of Teen Leadership Academies and development opportunities have been planned by bringing together individuals from the local school corporations, youth serving agencies, service

organizations and business leaders to develop and enhance leadership skills among local youth. The programs cover a variety of topics such as communication, public speaking, and listening skills; team building; personality styles and leadership; learning about city and county government; planning and organizational skills; board and group process; parliamentary procedure; consensus building; youth and adult perspectives and stereotypes; community visioning and philanthropy.

Impact: Pre- post participation scores indicated knowledge gains in regards to parliamentary procedure, group process and how boards function, community visioning and planning, personality and leadership styles, recognizing and understanding stereotypes, philanthropy, and trusteeship. Over 70% of the participants indicated significant positive growth of their overall leadership ability and skills. Teen participants exhibited and reported improved leadership skills in group activities and increased confidence in working with adults. Additionally, the youth participants reported that they had gained confidence to speak out on issues of interest, and learned life skills of time management, goal setting, planning and organizing, patience and determination.

Source of Funds: Smith-Lever, local sponsors and partners, and participant fees

Scope of Impact: Statewide

Key Theme: Children, Youth and Families at Risk

Project LEAD: Legal Education to Arrest Delinquency

Description: Many Indiana counties participate in the 4-H *Project LEAD* program in school settings in order to help students develop an understanding of the legal systems and to develop skills that help them communicate, handle conflict and make sound decisions so that they can avoid situations that may lead to undesirable behavior. Sessions are conducted in fifth-grade classrooms in partnerships with schools. This prevention program teaches about laws, law enforcement, the judicial system, decision-making, and consequences of actions. Many local professionals and elected officials volunteer their time to teach different portions of the program and host tours of the county facilities, including courtrooms and jails.

Impact: 10,668 participant evaluations using the Scale of Juvenile Legal Attitudes (pre-post-test) show that after the program, youth have a better attitude toward laws, law enforcement, the judicial system, and the idea that they must take personal responsibility to abide by laws and report unlawful acts. Additionally, teachers in the classroom report a positive change in attitude after completion.

Source of Funds: Smith-Lever

Scope of Impact: State specific

Operation Military Kids (OMK)

Description: The children of National Guard, Army Reserve and other military parents living in civilian communities become "suddenly military" when a parent is mobilized. Typical support systems for these young people may no longer be adequate and these "new" military youth have a need to connect with other youth in similar situations and to seek individuals who can empathize and help them cope with their new world.

Impact: Military families have realized an increased support base and greater understanding by the general public of their situation. Youth and their parents know that they have resources available to assist them during their time of personal sacrifice. Hero Packs which contain both fun and educational material for youth and informational material for a parent/guardian have been distributed to over 600 Hoosier youth.
430 individuals have utilized a mobile technology lab to contact a Hoosier service man or woman. Mini grants have been made available to 10 communities for military projects/events.

Source of Funds: USDA

Scope of Impact: State specific

Key Theme: 4-H Youth Development

4-H Component of Purdue Extension

Description: The 4-H component of Purdue Extension utilizes hands-on, research-based education that helps young people become competent, caring, confident, connected, and contributing citizens of character.

Impact: In 2005, 329,842 young people in Indiana (nearly 40% of the state's youth ages 10-18) were involved in some way with 4-H youth development programs. 79,899 participated with adult volunteers in organized community or school clubs, while 189,973 youth were involved in school enrichment programming and 59,970 were involved in short term or camping programs. Additionally, 404,638 youth participated in educational workshops, events and activities or made an information request to a local Extension office or a state 4-H specialist. The 4-H program also involves 11,664 volunteers who contribute a modestly estimated $7,264,339 annually in time, mileage and out-of-pocket expenses.

Source of Funds: Smith-Lever

Scope of Impact: State specific

Key Theme: Community Development

Entrepreneurship

Description: Economic development strategies have shifted from industrial recruitment to (a) the retention and expansion of existing firms and (b) the creation of new businesses. Extension provides educational offerings, resources and referrals designed to help existing and potential entrepreneurs enhance their prospects for success. Specific areas of emphasis are small businesses, especially in rural areas; new opportunities in entrepreneurial agriculture and natural resource enterprises (e.g., agritourism); and the strong and growing interest in entrepreneurship among youth and young adults, women, ethnic minorities, and new immigrants. Examples of specific programming follow:

1. Clinton County Educators conducted the Clinton County Tech Fair as a way to showcase high-tech companies in the community. The goals of the event were to provide a venue for small tech companies to network with one other and also to demonstrate to local officials the emerging tech company industry base and communicate what they need to grow and succeed. This program was done in partnership with the local chamber of commerce.
2. Extension Educators in Marion County (Indianapolis) partnered with Junior Achievement, the Black MBA Association, the Small Business Administration, and a women-owned technology company to develop BizExtension to unlock the entrepreneurial creativity of young people (16-25). The program includes classroom training, business plan assistance, and other learning activities.
3. The Agricultural Innovation and Commercialization Center (AICC) was created via a $1M grant from USDA Rural Development. The focus this year has been on developing additional easy to use and accessible business planning tools.
4. The New Ventures Team, a group of Extension Educators and Specialists, which was initiated in summer of 2002, continued to provide support and guidance to agricultural producers wanting to move away from agricultural commodities to value added products and services. The overall goal is to help launch successful ventures and to prevent ill-conceived ventures.
5. Several counties worked to establish and/or grow their local farmers markets. Partnering with chambers of commerce, main street organizations, and other agencies, Extension Educators provided education and technical assistance to farmers and home gardeners to help them market their products.
6. Extension Educators and Specialists worked together to conduct a series of one-day workshops on the topic of *Exploring Opportunities in Specialty Markets* to assist producers in the areas of pricing, marketing, and other aspects of developing value-added business ventures.

Impact:

1. The Clinton County Tech Fair was the first event of its kind and assisted local tech businesses demonstrate to local officials that technology infrastructure is essential for economic development.

2. 100% of participants demonstrated improved knowledge and skills in marketing, business promotion, cash flow, and record keeping.
3. Participants in the AICC program indicated that the publications and materials available from the program represented valuable information that was not available to them anywhere else.
4. 50% of New Venture program participants have started new businesses.
5. The majority of participants in the farmer's market programs indicate that they sold in excess of $1000 in produce during the season. Most also sell out during the day prior to the official end of the markets.
6. Specialty market program participants indicate the usefulness of the program. One participant commented that the program helped her "turn a hobby into a business."

Source of Funds*:* Smith-Lever, grants and local and statewide sponsors and partners

Scope of Impact*:* Local, regional and statewide

Planning and Visioning

Description: Communities, neighborhoods and regions need to create their own road map for the future in today's fast paced world of change. Extension can help facilitate these efforts by mobilizing local resources to help plan for the future and by engaging in applied research and providing educational programs and resources that focus on community and regional priorities. Two areas of high priority in many communities and regions are economic development planning/strategies and land use issues. While Extension's visioning and planning efforts will not be limited to these areas, they will receive special emphasis. Examples of specific programming follow:

1. Extension Educators in Shelby County led a community-wide effort to develop a vision statement for the community. A broad, inclusive group of stakeholders were included in the process. The Educator utilized technology for real-time group collaboration and to reduce the time needed to create the vision statement.
2. Educators and Specialist collaborated with a variety of partners to conduct four statewide two-way video land use programs. 466 individuals participated in the program. Topic included the role of the plan commission, board of zoning appeals, and updating the comprehensive plan.
3. An Educator in Vigo County worked with the local park board to assist them to identify their technical assistance needs and to engage university specialists to assist the community.
4. A Parke County Educator worked with the plan commission and local economic development to help them collaborate in their pursuit of funding to update both the comprehensive plan and economic development strategic plan. A potential funding source was identified and the Educator was asked to lead the grant writing process.

Impact:

1. The Shelby County vision statement was adopted by the county plan commission and included as a preamble to the updated comprehensive plan.
2. An evaluation of the two-way video land use program indicated that 97% of the 466 participants would recommend the program to others and that 74% of them plan to apply the new knowledge gained.
3. In Parke County, a $40,000 grant was obtained to update the comprehensive plan and develop a economic development strategic plan.

Source of Funds: Smith-Lever, grants and local and statewide sponsors and partners

Scope of Impact: Local, regional and statewide

Key Theme: Leadership Training and Development

Adult Leadership and Civic Engagement

Description: A rapidly growing body of research indicates that a strong civic infrastructure is a precursor to economic development and in the creation of strong and vibrant communities, neighborhoods and regions. Purdue Extension has a long history of creating and providing educational programs and leadership development opportunities for Indiana residents. Examples include such signature programs as Leadership 20/20, i-LEaD (Indiana Leadership Education and Development), the Master Gardener Leadership Program, and a new Natural Resources Leadership Development Institute. There are approximately 46 community leadership programs in Indiana and Extension Educators are involved in many of them, and Extension provides much of the base curricula, materials and updates even if Educators are not involved. Collateral programs include conflict management and facilitation training, building inclusive communities through multicultural education, grant writing workshops, the Myers-Briggs and Real Colors personality assessment programs, and youth leadership development. Examples of specific programming follow:

1. Warrick County Extension staff was instrumental in launching a county-wide leadership program several years ago. Staff continues to be a vital component of this program and delivered educational content in six sessions. Content included Leadership 20/20 curricula on several leadership topics.
2. Educators in Cass County developed a three-session series of educational programs called, *Community Voices - Together We Can* as means of connecting established community leaders with emerging minority leaders. Intended outcomes of the program included enhancing civic understanding, building leadership skills, and increasing involvement in civic activities.
3. Extension staff in Marion County (Indianapolis) developed a two-day workshop called, *Searching for Dollars - A Grant Writing Workshop for Community Leaders*. The workshop covered topics such as the mechanics of grant writing, developing skills and experience, and successful pulling a grant together.

4. Elkhart and LaGrange County Educators collaborate to offer the I-LEaD program. Participants included both Amish and non-Amish individuals. Several accommodations were made in terms of meeting locations and transportation to ensure participation of the Amish learners. As a result, program attendance never fell below 95%.
5. Educators in Hamilton County made changes to their Master Gardener program by adding leadership training. The goal of the expanded training is build the leadership capacity of Master Gardeners to work within their organization and in the community.

Impact:

1. 100% of participants in the Cass County Community Voices program indicated that the program stimulated their thinking about multi-cultural issues. 68% were able to identify new opportunities for civic engagement.
2. A follow-up evaluation to the Marion County grant writing workshop indicated that participants had successful raised over $2 million in grant funds as a result of what they learned in the workshop.
3. The I-LEaD program resulted in a positive outcome for participants including the eventual enrollment of several Amish students into a GED program (traditionally Amish individuals only receive formal education through 8th grade) and several indications of greater collaboration among Amish and non-Amish.
4. Participants of the Master Gardener Leadership program indicated that they had greater confidence to pursue leadership positions in the community.

Source of Funds: Smith-Lever, grants and local and statewide sponsors and partners

Scope of Impact: Local, regional and statewide

Key Theme: Workforce Preparation—Youth and Adults

Community-Based Learning Centers and Workforce Development

Description: Extension, in partnership with Purdue's Division of Continuing Education, has been heavily involved in creating several community based learning centers. These centers provide a variety of credit and non-credit offerings based entirely on local demand, using both face to face and distance-education technologies. The offerings of these centers, including the emphasis placed on workforce development, are improving the quality of life and the economic opportunities of local residents--especially for those residents currently marginalized from educational opportunities and institutions. Extension will continue to nurture existing learning centers and be as helpful as possible to other communities and neighborhoods that wish to consider the establishment of such a center. Extension-Continuing Education supported learning centers are operating in Adam, Clinton, Daviess, Hendricks, Jasper-Newton, Pulaski, Tipton, Wells, and Whitley Counties. Examples of specific programming follow:

1. Wells County educators offered a computer lab learning program for the residents of the community. Topics offered included *Getting Started with Computers, MS Word, MS Excel,* and *Introduction to the Internet*.
2. LaGrange County Educators collaborated with the school corporation to offer a *Successful Skills for Workforce Development* program. Twenty-three high school freshmen participated in the class. The program focused on functional employment abilities.
3. Clinton County offered a program called *Conversational Spanish for Professionals*. 387 people completed three levels of classes. Participants included local attorneys, police officers, firefighters, and other professionals who interact on a daily basis with Spanish-speakers.
4. Twelve counties participated in a program to provide training to childcare providers. In total, 74 childcare providers received Child Development Associate (CDA) certification.

Impact:

The learning centers and workforce preparation programs have had a major impact on the availability and outcomes of a vast range of offerings. A handful of *selected examples* follow:

1. The Education Center of Tipton County has enrolled over 246 students in Adult Literacy and GED courses, awarded over 45 GED diplomas. awarded 78 food service employees ServeSafe certifications,
2. Whitley County Learning Service has offered training to employees of over 60 businesses and organizations.
3. The child care certification resulted in an additional 1,050 children being cared for by a certified professional childcare provider.
4. Learning center participants were able to save time and travel expenses by being able to receive training locally.

Source of Funds: Smith-Lever, grants and local and statewide sponsors and partners

Scope of Impact: Local, regional and statewide

B. STAKEHOLDERS' INPUT PROCESS

The initial development of the 1999-2004 Plan of Work had extensive input by a cross-section of the citizens of Indiana. Over 5,000 citizens representing the diversity of the Indiana community participated in a series of two meetings hosted by each county extension staff. The purpose of the first meeting was to discover what citizens believed were the important issues in their community. During the second meeting, the listing of issues was reaffirmed with the group establishing a priority ordering of those issues. The county extension staff then prepared county Plans of Work as well as reports that transmitted the findings of each county to the state Program Leaders. From the 92 reports, the Program Leaders classified the many issues into 16 priority issues that form the Indiana Plan of Work.

However, it is critical for stakeholders and all citizens to have a continued opportunity to provide input on identification of issues in their communities. Each of Indiana's 92 County Extension Boards is a broad representation of local citizens who provide identification and prioritization of the issues to be addressed by county extension programs.

In addition, local citizens in each county are selected to represent the connection to the statewide Purdue Council on Agricultural Research, Extension, and Teaching (PCARET). PCARET members represent the Extension Boards, elected officials, community leaders, staff from K-12 education, and business. The key criteria in their selection to PCARET are their interest and their willingness to improve the quality of life in their communities through the programmatic functions of Purdue Extension.

Through their county connection, these citizens participate in twice-a-year multi-county meetings attended by County, District, and State Extension administrators as well as others such as the Dean of Agriculture and the Directors of Ag Research, Academic Programs and International Ag Programs. Most of the discussions during these Area PCARET meetings focus on issues of concern to these local citizens.

Once each year, typically in November or early December, a State Conference is provided for the members of PCARET and County Extension Directors. The format of the Conference is to provide an opportunity for obtaining input from the participants in a facilitated and structured manner. The Conference also provides an awareness of what Extension is providing to the citizens of Indiana and seeking their reaction to future educational needs and issues. The following educational presentations were presented and associated discussions occurred in November at the 2005 State Conference: The Financial Health of the State and Implications for State and County Government; Bio-Energy: Potentials and Challenges; Forestry: Key Components in Indiana's Economy; Land Use, Livestock Production, Air Quality: Implications for Local Land Use Decisions; and Tips for Healthy Eating. Most of the College of Agriculture Administrators and Faculty serve as ex officio committee members for county and state agriculture associations and organizations, and receive stakeholder feedback through these interactions.

C. PROGRAM REVIEW PROCESS

There have been no significant changes in the program review processes since Indiana's 5-Year Plan of Work was submitted.

D. EVALUATION OF THE SUCCESS OF MULTI AND JOINT ACTIVITIES

Purdue Extension is proud of its achievement in effectively and efficiently responding to the needs and concerns articulated by Indiana citizens through various means of harvesting their input. To deliver relevant educational information to a spectrum of audiences, Purdue Extension is obligated to continually focus on three major tasks: 1) actively seek citizen input, 2) integrate research and extension outcomes into program planning, and 3) intensely scrutinize programs through effective reporting and evaluation systems. As evidenced by the reports provided for each Goal, Purdue Extension has accomplished these steps.

In the past six years, Purdue Extension has aggressively addressed the responsibility of delivering relevant information to new audiences and new information to traditional audiences. Engaged audiences vary from traditional family, youth, community and agricultural groups to new populations such as Asian or Hispanic communities, and from targeted groups such as participants in funded nutrition education programs to under-served audiences such as families with small farms and Amish farmers. They also vary from traditional families planning retirement to single fathers and from youth in 4-H projects to after-school children involved in enrichment programs. In the past six years, Purdue Extension has become much less tradition bound and more capable of reaching audiences in a variety of high touch and high technology manners.

The process of program evaluation is being improved through the on-going adoption of the LOGIC evaluation model. Extension staff associated with the 16 Plan of Work Oversight Issue teams completed several days of staff development regarding the utilization of this tool. All Extension (as well as research and teaching) staff participated in training in the past four years to prepare them to effectively evaluate their educational programs using the LOGIC model. Within the past two years, all field staff participated in a refresher class that focused on program evaluation. In addition, over 50 campus Extension specialists participated in an intense half-day session that focused specifically on the LOGIC model and its application to program planning and evaluation. Two additional professional positions, designed to provide focus on staff support in the areas of program evaluation and accountability, were added in the office of the Director of Extension in FY04.

The System for Accountability and Management (SAM), based on the LOGIC evaluation model, allows Extension staff to report community needs, create an action plan for addressing those needs, and a report against the plan. The system allows educators to identify programs that target underserved and underrepresented audiences. Having one system where they can plan, collect data, and prepare impact and other reports allows staff to be more efficient and effective in planning and reporting to stakeholders.

Goal 1:
Purdue Extension focused on primarily three program areas related to Goal 1. These include: 1) Agricultural Competitiveness; 2) Horticulture and Turf, and 3) Alternative Agricultural Enterprises and practices. Using a wide variety of educational methods and opportunities, Extension staff helped citizens not only learn how to be more productive and efficient in their farming operations, as well as expand and diversify their production opportunities. Many traditional producers are adding horticultural crops to their mix of crops and are contracting with food processors for increasing acreage of Indiana farmlands. This is a new and rapidly growing outreach area for Purdue Extension, and the system is responding by building a local and statewide agency network to address this demand.

Indiana's population is increasing non-agricultural and as such there is an increased demand for home and consumer horticulture, and life-style farming. Educating the general public on agriculture is an important aspect of the program, and helps producers remain competitive and have their products accepted. Both adults and youth have been introduced to a variety of environmental issues that challenge the agricultural community, as well as the emerging technologies producers are turning to make decisions.

Ongoing research and extension programs, in collaboration with research and extension staff in other states are addressing the issues of on farm quality assurance o f value added grains and livestock production as well as working on the proper and legal use of animal manure as crop nutrients.

Goal 2:
Purdue Extension food safety and quality education is targeted to both the food safety industry and the general public. Programs emphasized in FY2005 for the food service industry include Food Safety Day, ServSafe, and Essentials of Food Safety and SuperSafeMark. These programs teach food safety sanitation and allow workers to become certified.

Food safety programs for the general consumers help them learn basic concepts that can decrease the incidence of food illness in Indiana. Several programs target low income families with this education, while others are designed primarily for youth and teach these concepts through games, music, and videotapes.

Goal 3:
Nutrition education for adults and youth is essential to help form healthful dietary practices to support longer, healthier, and happier lives. Purdue Extension emphasizes nutrition education

across the state to help consumers make informed dietary choices using basic nutrition information. Although the topic, setting and audience varies in programming, the Dietary Guidelines for Americans are included in all nutrition education.

The Expanded Food and Nutrition Program (EFNEP) and the Food Nutrition Program (FNP) are programs targeted to limited resource families. The information provided in these efforts provides information to help families stretch their food resources while still maintaining high-quality nutritious meals.

Purdue Extension Consumer and Family Science Educators are beginning to take an active role in their communities to provide leadership and nutrition resources to self-interest groups for the development of school wellness policies. This effort will continue to build in the coming years as Extension becomes an integral part of helping communities develop their own wellness initiatives.

Goal 4:
An understanding of natural resources and our environments is essential for all citizens of Indiana and Purdue Extension is helping to provide education and outreach programs that allow homeowners and agricultural producers to make wise decisions that impact the environment. Purdue staff work with county officials to provide training on land use issues that impact the growth and development of local communities and counties. They help producers and the public understand the issues of water quality and how day to day practices can affect this valuable resource. The outcomes of these efforts have resulted in an increased awareness of environmental issues, and through a combination of extension and research efforts, significant progress in being made with educational programs.

Goal 5:
Improving the quality of Indiana's citizens is a major effort of Extension programming efforts. Indiana's demographics have changed drastically in the last decade and Extension programming is changing to meet those changing needs of citizens. The youth development programs focus on new audience development with programs that build youth competencies relevant to enabling youth to become successful adults. One example is the establishment of 4-H After-School Clubs where Extension collaborates with a variety of organizations to provide ongoing after-school child care programs.

Families are the strength and competitiveness of our nation and Extension programs focus on helping families remain strong. Extension educators provide programs on parenting skills, and financial management to help families learn effective ways to deal with these vital areas. Programs also target child care providers with learning experiences so they may obtain their Child Development Associate credential. Efforts are also underway with a variety of financial institutions to partner on programs to help citizens sharpen their financial management skills.

Purdue Extension has established learning centers in a number of rural communities, and is working on expanding the number of these in the coming years. These programs provide a

variety of learning experiences for their rural residents, such as workforce development programs, certification programs, language training, as well as college credit courses. Response to the learning centers has been excellent as people can continue with life long learning without having to travel long distances to obtain the information they need for work or personal benefit.

E. Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities – Chart

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

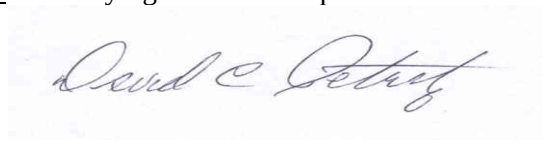
Select One: ☐ **Interim** ☐ **Final**
Institution: Purdue University
State: Indiana

	Integrated Activities (Hatch)		Multistate Extension Activities (Smith-Lever)		Integrated Activities (Smith-Lever)	
Established Target %	5%	%	5%	%	5%	%
This FY Allocation (from 1088)	4,709,068		7,885,854		7,885,854	
This FY Target Amount	$235,453		$394,293		$394,293	
Title of Planned Program Activity						
Carbon Sequestration: A Forum on Opportunities in the Eastern Corn Belt			56,403			
Delivery of a Weather-Based Spray Advisory Program to Illinois and Indiana	54,316		54,316		54,316	
Emerald Ash Borer Awareness			$23,254			
Improving Quality of Indiana's Apple Crop	47,110		47,110		47,110	
Innovation in Handling Large-Scale Animal Mortalities			58,097			
Vegetable Farmers Stay Informed			69,798			
Demand for Certified Meat Products	36,453		36,453		36,453	

Development of Sustainable Biobased Products and Bioenergy in Cooperation with the Midwest Consortium for Sustainable Biobased Products and Bioenergy		60,163	
Sea Grant Academy		20,316	
Multistate Leadership Role - Leadership Development for the 21st Century (LEAD 21)		4,029	
Alfalfa Stand Density: To Keep or Not to Keep - That is the Question	141,620		141,620
Purdue Brings Researchers, Poultry Industry Together to Reduce Pollution	49,138		49,138
Pork Production Systems Modeling	18,952		18,952
New Molecular Marker for CystX® will Speed Development of New Soybean Varieties	35,013		35,013
Flowers Lure Good Bugs to Kill Bad Bugs in Landscape	23,254		23,254
Purdue Income Tax School Teaches Tax Professionals about Tax Changes	59,014		59,014
	$464,870	$429,939	$464,870

Carryover

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



March 23, 2006

Director **Date**

E. MULTISTATE EXTENSION ACTIVITIES BREIF SUMMARIES

Carbon Sequestration: A Forum on Opportunities in the Eastern Corn Belt

Description: Considerable uncertainty still exists about the physical quantities of C that can be captured with alternative land use management despite general agreement about C-sequestration enhancement with certain tillage, rotation and nutrient management systems. Farmers, the agricultural industry and conservation partners (NRCS, IDEM, etc.) lack information that summarizes current thinking on management practices to increase soil C-sequestration while optimizing cropland productivity. Furthermore, many are unaware of national and regional C-sequestration policies and their potential impact on Indiana's agricultural industry. Purdue University in collaboration with the 9-state Consortium for Agricultural Soils Mitigation of Greenhouse Gases (CASMGS) conducted a two-day workshop on C-sequestration opportunities in the Eastern Corn belt. The workshop was held in December, 2004 in Indianapolis. This forum brought together approximately 100 key stakeholders, researchers and educators to discuss current policy, programs, and accepted best management practices of C-sequestration and greenhouse gas mitigation strategies for Indiana agriculture. Through a combination of presentations, open discussion sessions and farmer, researcher or educator panels, attendees learned about agricultural best management practices, economics and pilot programs for C-sequestration and C trading. Perspectives on issues ranged from the local level to the national and international level. Certified Crop Advisors attending the entire program earned two Soil and Water Quality continuing education units (CEUs) and one professional development CEU.

Impact: Individuals, agricultural organizations, business representatives and industry and conservation groups learned about their potential roles in carbon trading programs and what would be required for the Indiana agricultural community to become involved in these opportunities.
Impact Summary This workshop allowed the farming community and their consultants and industry and conservation partners to learn about emerging financial opportunities ($10 to 30/acre) based on using soils to reduce the levels of atmospheric CO^2. The approximately 100 attendees learned about new as well as anticipated national and regional policies and programs and what would be required for Indiana farmers and the agri-business community to become beneficiaries of these opportunities.

IN, OH, MI, KS, NE, CO, TX, IA, MT

Delivery of a Weather-Based Spray Advisory Program to Illinois and Indiana

Description: Foliar diseases of muskmelon and watermelon represent potential yield losses for vegetable growers in the Midwest every season. The major foliar diseases of watermelon are anthracnose and gummy stem blight, while Alternaria leaf blight represents the primary threat to muskmelon. At this time, no significant host resistance exists to either of these diseases. While production practices such as crop rotation and fall tillage can mitigate the severity of these diseases, most commercial growers in the Midwest rely on preventive fungicide applications. In a conventional preventative fungicide application program for muskmelon or watermelon, growers rely on a calendar-based application schedule. Most growers apply fungicides on a weekly schedule. Typically, growers transplant into the field in the first week of May. The initial fungicide application occurs by mid-May. Harvest may extend through July for muskmelon and until Labor Day for watermelon. This represents approximately 8 and 14 fungicide applications for muskmelon and watermelon, respectively. The cost of these fungicides represents one of the major expenses to muskmelon and watermelon growers. In an effort to reduce fungicide costs and limit the amount of fungicides in the environment, the MELCAST program was developed at Purdue University (Evans and Latin, 1993; Monroe et al., 1997; Latin and Egel, 2001). MELCAST is a weather-based spray-advisory program that uses leaf wetness and temperature to quantify the disease potential for a given time period. Instead of using a calendar-based schedule to apply fungicides to muskmelon or watermelon, commercial growers can now use MELCAST Environmental Favorability Index (EFI) values as a weather-based threshold. Purdue University recommends a 35 EFI threshold for the management of both gummy stem blight and anthracnose on watermelon. A 20 EFI schedule is recommended for management of Alternaria leaf blight on muskmelon. In an average year, the MELCAST program saves the commercial watermelon grower 2 to 3 fungicide applications by indicating when fungicide applications are most critical (Latin and Egel, 2001). During the 2003 and 2004 season, the MELCAST program was used in Illinois, Maryland/Delaware, Georgia as well as Indiana. The MELCAST system is currently being tested in Iowa.

Impact: The potential number of fungicides saved can be used to estimate the total impact of this project. In an average year, growers who use MELCAST apply 2 to 3 fewer fungicide applications than if a calendar based system were used. For estimation purposes, let us assume that each one of the 130 growers who received the MELCAST Update saved one fungicide application per season by using MELCAST. This number is probably conservative as many growers saved more than one spray. The total number of acres for the 130 growers is estimated by assuming that each grower has 50 acres of muskmelons and/or watermelons. Some growers have hundreds of acres of cucurbit crops. Therefore, this figure is probably conservative as well. Finally, it is assumed that the ratio of acres sprayed with chlorothalonil to mancozeb were one to one. With this assumption, 6,500 acres for growers using MELCAST in 2003 and 2004 with a combined savings of $60,303 from reduced application of the two fungicides. The MELCAST system will be delivered to the major muskmelon and watermelon growing regions of Indiana

and Illinois so that fewer fungicides are applied over a season. In particular, the amount of carbamate fungicides used by muskmelon and watermelon growers in a season will be reduced.

IN, IL

Emerald Ash Borer Awareness

Description: Emerald ash borer (EAB), an exotic pest that could eliminate billions of native ash trees from North America, was first reported in Indiana in spring 2004. With EAB now present in 6 townships in Steuben and LaGrange counties, Indiana citizens have good reason to be concerned. The EAB has already eliminated over 12 million ash trees in Michigan. Ash trees are important to the Indiana economy and environment. The timber value of woodland ash in Indiana has been estimated at $500 million. The cost of removing and replacing ash trees lost from Indiana urban forests could cost at least $300 million. As a key element of wetland forests, ash trees line much of the riverbanks and act as natural filters that help keep agricultural runoff out of our water supply. The national EAB Science Advisory Panel determined that the best strategy to protect North America's ash resource from the pest is to aggressively slow its spread. Natural spread of flying beetles can be slowed by destroying infested ash trees as they are found along with all other ash trees within a half mile of the find. Artificial spread of the infestation can be accomplished by stopping the moving of ash firewood and other ash products out of known infested areas. To facilitate this policy in Indiana, we at Purdue needed to significantly boost public awareness of EAB, thus equipping the public to actively participate in detection and eradication of EAB in Indiana. Further, to avoid public confusion, we realize the importance of harmonizing our message with that of other state agencies as well as messages of our neighboring states with EAB. As active members of the Indiana Exotic Forest Pest Advisory Committee and the EAB Tri-State Communications Committee (Ohio, Michigan, Indiana) we formulated clearly defined objectives for our educational program. The first objective was to make people care about ash trees and be able to recognize EAB and its injury. The second objective was to involve the public in the search and reporting of suspicious looking ash trees, or ash firewood. Last and probably most importantly, was to convince the public that they could help stop the spread of EAB by changing their practice of bringing firewood along on camping trips. In addition to conducting a series of meetings with the affected public, various green industry and garden groups, and public educators, we launched a media campaign that included radio spots highway billboards and targeted audience education sessions.

Impact: The declaration of EAB Awareness Week by the governors of Ohio, Michigan and Indiana increased media coverage. At kick-off media event, we introduced our traveling EAB display and "Eric the EAB" costumed character, both of which were funded by USDA-APHIS. The display and costume have since been used in outreach at the Indiana State Fair, the LaGrange County Fair, Elkhart County Fair, the Farm Progress Show in Illinois and the Farm Science Review in Ohio. The week's events resulted in over 50 separate stories by newspaper, radio and television outlets at the start of the Indiana camping season. Our efforts to focus media attention on firewood as the primary vector of EAB have facilitated fundamental changes at campgrounds throughout the state. Many private campgrounds, especially in NE Indiana, no

longer allow firewood of any kind to be brought to campgrounds. Some state parks such as Pokagon now telephone campers from Zip codes where EAB is quarantined who have made reservations at the park's campground, telling them not to bring firewood with them. EAB literature and information is given to all campers at the gate. EAB information is part of the naturalist curriculum around the state. At least eight RV dealerships now clearly display EAB posters to alert their customers about the issues. As a result of the town meetings, over 50 compliance agreements were signed enabling citizens to extract some lumber or firewood value out of their trees before they were destroyed. At these meetings many attendees volunteered information about possible new EAB sites, both inside and outside of the quarantined townships. These leads were subsequently followed up on by IDNR. As a result of our work with the Indiana Nursery Industry, over 40 nurserymen and landscapers throughout the state requested EAB kits to use to educate their employees and to display in their businesses. As a result of local publicity about EAB, we were asked to examine dying ash trees at a shopping mall in Lafayette after the property manager was told by an Indianapolis landscaping firm that the trees had EAB and needed to be destroyed. Although the ash trees did harbor native borers, no EAB was found. The emerald ash borer has already eliminated over 12 million ash trees in the United States. In Indiana, timber value of woodland ash has been estimated at $500 million and the cost of removing and replacing ash trees lost from urban forests could cost at least $300 million. As a key element of wetland forests, ash trees line much of the riverbanks and act as natural filters that help keep agricultural runoff out of our water supply.

IN, MI, OH

Improving Quality of Indiana's Apple Crop

Description: According to a survey conducted in 2005, the codling moth is the most important insect pest that Indiana's apple growers have to manage. For several decades, apple growers have relied on organophosphate insecticides for managing codling moth and other important insect pests. In 2001 and 2002, there were several reports of control failures with these insecticides. Because resistance had been reported in other states, it was feared that codling moths in Indiana were also developing resistance to these insecticides. One grower reported that he had to discard over 60% of his apples because they were infested with codling moths. He also reported that attempts to use expensive alternative insecticides did not provide adequate levels of control. An insecticide trial was conducted at the farm of the grower who had reported control problems. The organophosphate insecticide Guthion (azinphosmethyl), that had not provided adequate control in recent years, was included as well as a number of alternative products. The data collected from that study showed that Guthion provided the best control of all products tested, at a level of control that the grower was very pleased with. Several alternative products also provided excellent control. When we investigated further the reasons for the control failure of the past, we found that the grower had been using reduced rates of the insecticides. In addition, the Indiana Horticultural Society held its summer meeting at the orchard where this study was conducted.

Impact: Growers were shown that the short term economic benefit of using reduced rates of insecticides can result in very serious long-term economic consequences. Growers were also

shown that there are several alternative insecticides that are less toxic that can be used to provide excellent levels of control of codling moth. The grower who previously lost a major portion of his apple crop because of codling moth has reported that in 2004 and 2005 he has achieved almost 100% control of codling moth, resulting in fewer culled apples and higher profits.

IN, IL, KY, MO, OH

Innovations in Handling Large-Scale Animal Mortalities

Description: The United States exists with a heightened sense of awareness of its vulnerability to the effects of disease, weather, and terrorism. Widespread, large-scale livestock deaths could result from any of the aforementioned causes. The carcass disposal challenges stemming from large-scale livestock deaths could prove daunting and require careful planning and action to prevent major food security problems and massive economic losses. A team of Purdue University personnel including Don Jones, Stephen Hawkins, and Daniel Ess produced a chapter focused on non-traditional and novel technologies that was part of a report entitled, Carcass Disposal: A Comprehensive Review. The report was produced for the USDA-Animal and Plant Health Inspection Service (USDA-APHIS) by a consortium of collaborators that formed the Carcass Disposal Working Group. The group included personnel from the Kansas State University's National Agricultural Biosecurity Center, Texas A&M, Sandia National Laboratories, and Purdue University. The report contains 17 chapters in two parts, the first addressing a wide range of disposal technologies, the second dealing with cross-cutting and policy issues including economics, regulatory issues, and environmental impacts.

Impact: A major report entitled, Carcass Disposal: A Comprehensive Review, was created by a consortium that included a team from Purdue University. The report, produced for USDA-APHIS, is targeted at officials that would have to deal with the effects of widespread, large-scale livestock deaths resulting from disease, weather, or terrorism. The report, intended to serve as an indispensable resource for officials tasked with planning for safe and timely disposal of animal carcasses, has been requested by interested parties in the United States, Australia, Great Britain, and Canada. It has also been downloaded from the Kansas State University Food Safety and Security website more than 8,000 times.

IN, KS, TX

Vegetable Farmers Stay Informed

Description: Indiana vegetables had a farm value of over $130 million in 2003, accounting for more than 2.6% of Indiana's cash farm receipts. Opportunities for production of these crops in the state continue to increase as consumer demand increases for locally produced fresh produce. Traditional agronomic crop farmers are looking for alternatives to increase income; young families are looking for enterprises that can make the small family farm economically viable and non-farmers are looking for opportunities to start horticultural businesses. Current and new producers will benefit from access to research-based information on profitable and

environmentally responsible production, post-harvest, and marketing practices; as well as from opportunities to network with one another and others with experience in the industry. Extension Specialists and Educators organized educational programs for vegetable growers, including the Illiana (Illinois Indiana) Vegetable Growers School, the Indiana Horticultural Congress, and Fruit and Vegetable Plot Tours.

Impact: Vegetable farmers know more about producing and marketing their crops. Each of the three educational programs was attended by at least 50 people involved in fresh market vegetable production. Many producers plan to change their production or marketing practices based on knowledge they gained at the educational conferences. The 44 educational presentations or opportunities provided at these meetings were evaluated by a total of 37 participants, resulting in 354 responses to individual educational presentations. Sixty-four percent of the responses indicated that the producer planned to change production or marketing practices based on something they learned in a particular presentation. Examples of possible changes included trying new varieties, planting ryegrass as a cover crop, alternating fungicides, using sticky traps to scout for insects, growing a crop in high tunnels, and arranging to transport produce using back hauls.
IN, IL

Demand for Certified Meat Products

Description: Consumer demand for process verified products appears to be rising, however it is unknown whether consumer willingness to pay exceeds the costs of certifying compliance with process standards. In addition, it is not clear to what extent markets will expand to increase market access for farmers who see dwindling alternatives in the marketplace. Purdue Agricultural Economists estimated the willingness to pay for natural pork products and determined the potential for market expansion with the introduction of such a certified product. This was done in the context of an assumption of heterogeneity on the part of consumer demand whereas previous theoretical work assumed that all consumers uniformly preferred the certified product.

Impact: The results of our analysis suggest that there is a large segment of consumers (~43%) who have substantial willingness to pay for antibiotic free, environmentally friendly, and animal welfare certified pork. The results suggest that as much as 62 % of the market could transition to such a product in the long run. Members of the farm community and groups of farmers are beginning to examine the development of standards for similar products. Purdue Extension has been discussing the details of developing standards and the strategies associated with launching such new products with these groups. The farm community can find new marketing opportunities in the area of natural pork production if they develop appropriate standards aimed at meeting concerns of consumers and use a third party to verify their compliance with those standards. The analysis was developed into a pilot business plan used by the Agricultural Innovation and Commercialization Center at Purdue as a model for marketing a process as a product attribute.
OK, IN

Development of Sustainable Biobased Products and Bioenergy in Cooperation with the Midwest Consortium for Sustainable Biobased Products and Bioenergy

Description: Under the leadership of Purdue University, this project integrates institutional capabilities of U. Illinois, Iowa State, Michigan State, Ames Laboratory (Ames. Iowa) and USDA NCAUR (Peoria, Illinois) and Purdue University to help solve a crucial problem: namely, the proliferation of low value, fiber rich distillers grains (DG) now being produced in the corn dry milling industry. The project has examined and carried out preliminary analysis and evaluation of distillers' grains obtained from a commercial dry grinding ethanol production plant. The results show that the residual materials that remain after fermentation have a significant fraction (over 50%) of cellulose, starch, and hemicellulose, which can potentially be converted to fermentable sugars and ultimately to ethanol. In cooperation with an enzyme company (Genencor), hydrolysis of these materials have been carried out using a commercially-available enzyme. Pretreatments utilizing hot water (under pressure), and ammonia freeze explosion (AFEX) have been carried out. The resulting sugars included both glucose and xylose. Both have been shown to be fermentable by yeast, and by anaerobic microorganisms resulting in ethanol and a number of other valuable alcohol products. The economic model of a dry grinding plant has been initiated, and will be used to incorporate improvements derived from the research, in order to communicate potential impacts and benefits of different methodologies for utilizing distillers' grains.

Impact: The dry milling industry is growing rapidly, particularly in the Midwest. This proliferation has the potential to depress the market for ethanol by-products and decrease the profitability of dry mills. This concerted effort will add value to DG by further processing them into additional fermentable sugars and ethanol, while leaving a solid that is reduced in weight and rich in protein. As part of the Biomass Program within DOE's Office of Energy Efficiency and Renewable Energy, it is expected that this research will contribute directly to the multi-year technical plan particularly as related to the "Sugar Platform" and "Products", thus helping to ensure the department meets its targets to establish biomass as a significant source of sustainable fuels for the United States. The local impact is even more important: the generation of jobs in an emerging agriculturally based bio-industry area. Also, general development of alternate uses and enhanced value of corn and corn residues in the State, and nationally, development of integrated approaches for making grants to ethanol plants more cost effective, and expanding markets for corn while producing an environmentally attractive fuel.

IN, IL, IA, MI

Sea Grant Academy

Description: The National Sea Grant network has experienced a relatively high rate of turnover in their extension specialists and agents. These new extension personnel require training and skills necessary to perform their duties and to engage their clients in solving coastal issues.

Purdue Extension worked with two other Sea Grant Extension program leaders and one senior Sea Grant extension agent to create the National Sea Grant Academy. Buy-in was sought and received from all 32 Sea Grant programs in the nation. Additional funding to support the Academy was provided by the National Sea Grant Program office. The entire curriculum for the Academy was developed, designed, and delivered to the first year's class in 2005. The Academy is delivered as two one-week sessions and one summer session in which participants apply the skills they learn to develop a needs assessment, a plan of work, and development of an evaluation for their plan of work. Session 1 was conducted in Washington D.C., and trained the participants in the use of the LOGIC model, introduced them to the entire Sea Grant network - which they are now part of, and included training on necessary skills they will need to perform their job. The second one-week session provided participants training in facilitation skills, working with difficult people, working with advisory committees, and refined their plan of work and corresponding evaluation plan.

Impact: Ten percent of the National Sea Grant specialists and agents have conducted a user needs assessment and developed plans of work that are designed to achieve impact. These 32 participants have been paired with mentors in their home state to help direct their development over 10 years.

IN, IL

Multi-State Leadership Role - Leadership Development for the 21st Century (LEAD21)

Description: In January 2004, the Extension Committee on Organization and Policy National Extension Leadership Development (NELD) Advisory Council began discussing the leadership competencies of the two land-grant universities national leadership programs and the logistics of combining these two programs. The NELD Advisory Council membership included a representative member from the Experiment Station Committee on Organization and Policy/Academic Committee on Organization and Policy (ESCOP/ACOP) Advisory Council who managed and provided leadership to the ESCOP/ACOP Leadership Program. The ESCOP/ACOP representative volunteered to take the idea of combining the two leadership programs to the ESCOP/ACOP Board of Directors. At that same time, representatives from the ECOP NELD program and the ESCOP/ACOP program shared the idea with their national board of directors.

In August 2004, representatives from both the ESCOP/ACOP Board of Directors and the ECOP NELD Advisory Council program met to review the core curriculums and discuss the logistics of merging the two programs into one. Justification for merging the two programs included cost savings, one board of directors, and a unified leadership approach in the land-grant system to discovery, learning and engagement. The land-grant institutions represented at this multi-state planning meeting included: North Carolina State University, North Carolina A&T State University, Purdue University, Texas A&M, Ohio State University, USDA-CSREES, the American Indian Higher Education Consortium, the University of Arkansas, Tennessee State

University, University of Nebraska, and New Mexico State University. The board meets face-to-face twice a year and by conference call.

The primary purpose of LEAD[21] is to develop leaders in the land-grant institutions and their strategic partners who link research, academics, and extension in order to lead more effectively in an increasingly complex environment, either in their current position or as they aspire to other positions. The first class of 78 was convened through an application process in June 2005. The program addresses a set of core competencies representing the range of knowledge, skills, values, attitudes, and behaviors that will be present in the participants at many levels. For the first group of 78 participants, the program competencies included: integrating and systems thinking, developing self and others, valuing diversity, communicating effectively, managing change, resolving conflict, developing and managing resources, leading with integrity and values, and developing a deeper knowledge and appreciation of higher education.

Participants were offered three sessions. The program planning committee is reviewing the evaluation comments from the first two sessions as we prepare for Class II. We have hired a research faculty member at the University of Arkansas to work with the Board of Directors to develop and administer the final evaluation form. Evaluation results will be shared with the LEAD[21] Board of Directors and with ESCOP, ACOP, ECOP, and ICOP boards. .

Multi-State Activity: IN, NC, TX, OH, AR, TN, NE, NM

F. ACTUAL EXPENDITURES OF FEDERAL FUNDING FOR MULTISTATE AND INTEGRATED ACTIVITIES - CHART

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

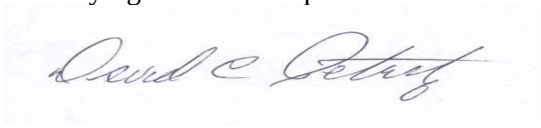
Select One: ☐ **Interim** ☐ **Final**
Institution: Purdue University
State: Indiana

	Integrated Activities (Hatch)	%	Multistate Extension Activities (Smith-Lever)	%	Integrated Activities (Smith-Lever)	%
Established Target %	5%	**%**	5%	**%**	5%	**%**
This FY Allocation (from 1088)	4,709,068		7,885,854		7,885,854	
This FY Target Amount	$235,453		$394,293		$394,293	
Title of Planned Program Activity						
Carbon Sequestration: A Forum on Opportunities in the Eastern Corn Belt			56,403			
Delivery of a Weather-Based Spray Advisory Program to Illinois and Indiana	54,316		54,316		54,316	
Emerald Ash Borer Awareness			$23,254			
Improving Quality of Indiana's Apple Crop	47,110		47,110		47,110	
Innovation in Handling Large-Scale Animal Mortalities			58,097			
Vegetable Farmers Stay Informed			69,798			
Demand for Certified Meat Products	36,453		36,453		36,453	

Development of Sustainable Biobased Products and Bioenergy in Cooperation with the Midwest Consortium for Sustainable Biobased Products and Bioenergy		60,163	
Sea Grant Academy		20,316	
Multistate Leadership Role - Leadership Development for the 21st Century (LEAD 21)		4,029	
Alfalfa Stand Density: To Keep or Not to Keep - That is the Question	141,620		141,620
Purdue Brings Researchers, Poultry Industry Together to Reduce Pollution	49,138		49,138
Pork Production Systems Modeling	18,952		18,952
New Molecular Marker for CystX® will Speed Development of New Soybean Varieties	35,013		35,013
Flowers Lure Good Bugs to Kill Bad Bugs in Landscape	23,254		23,254
Purdue Income Tax School Teaches Tax Professionals about Tax Changes	59,014		59,014
	$464,870	$429,939	$464,870

Carryover

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



March 23, 2006

Director **Date**

F. INTEGRATED RESEARCH AND EXTENSION ACTIVITIES BRIEF SUMMARIES

Alfalfa Stand Density: To Keep or Not to Keep-That is the Question

Description: There is an ongoing debate concerning how to dense an alfalfa stand needs to be in order to keep it another year. Scientists in Wisconsin suggest that a minimum of 40 shoots per ft2 is needed for high forage yield. In recent months, they have increased this critical shoot density value to 55 shoots per ft^2. Unfortunately, there is little published data to support their critical shoot values. Alfalfa producers are currently confused by this recommendation because 40 to 55 shoots per ft^2 appear to be a viable stand.
Purdue researchers initiated a study in 1997 that continued until 2004 where the response of alfalfa yield and yield components were determined in response to increased potassium and phosphorus fertilizer application. We have 28 yield-shoot density estimates for each of 20 fertility treatments over this 7 year time frame. This permits us to thoroughly evaluate the relationship between shoot density and forage yield of alfalfa.

Impact: Under normal fertility management forage yield was not influenced by shoot densities as low as 25 to 30 shoots per ft^2. In exceptional situations when plots were not fertilized, or only potassium or phosphorus were applied (not both), yield declined when shoot densities declined below 40 per ft^2. Under no circumstances were yields increased as shoot densities increased above 40 per ft^2. Our recommendation is that producers consider replacing an alfalfa stand when shoot densities decline to 25 to 30 shoots per ft^2. This critical value is considerably lower than current recommendations (40 to 55 per ft^2), and will give producers the option to keep older stands of alfalfa up to 50%longer if desired without worry of significant loss in productivity. This will spread the high cost of alfalfa establishment ($400/acre) over more production years and reduce costs.

Purdue Brings Researchers, Poultry Industry Together to Reduce Pollution

Description: The broiler industry tends to over-feed protein due in part to lack of sufficient research. This overfeeding creates additional costs for the producer and increased nitrogen emissions from their farms. For years, discussions between academia and amino acid suppliers / academia and formulating nutritionists have occurred on an informal basis, centering around numerous reasons why the industry could not adopt the concept of changing diet formulation from a "total amino acid" basis to a "digestible amino acid basis", including:
A) lack of consistent methodologies across labs (academia / contract research facilities),
B) need to move forward on filling voids of research - what was and still are limitations from an implementation standpoint,
C) need of establishment of further collaboration/synergy with test tube assays with bird studies.
A digestible amino acid workshop/roundtable for the poultry industry was held for academic researchers, all of the U.S. based amino acid suppliers, and formulating industry nutritionists.

Representatives from the broiler industry in attendance represented approximately 7 billion broilers or 80 percent of broilers produced in the U.S. each year.

Impact: Purdue researchers helped establish a working group of university and poultry industry staff that will promote reduced-protein feed for broiler producers. The goals of this newly established working group are to fill gaps in knowledge and provide a publicly accessible database of information so that the industry is more able to adopt and advance the digestible amino acid concept. Long-term impacts of reduced protein formulation with adoption of the digestible amino acid concept are greatly reduced feed costs and nitrogen emissions from broiler operations in the U.S. which are imperative with pending ammonia emissions regulations in 2009 and the current water quality regulations for nitrogen pollution.

Pork Production Systems Modeling

Description: Pork producers are striving to produce quality lean pork as efficiently as possible with minimal environmental impact. Feed represents approximately 65% of the costs of pork production. Feeding pigs the optimal levels of essential amino acids and phosphorus will reduce feed costs while reducing environmental impact. Recently a feed additive, Paylean^{TM} has been approved to increase the rate and efficiency of lean growth. The use of Paylean^{TM} must take into account the marking system and product system economies. A stochastic version of the pig compositional model has been developed. The model predicts a compositional growth live weight growth and feed intake curve for each pig in a 1000 head finisher. The program has been used to (a) evaluate the optimal marketing strategy with and without Paylean^{TM}; (b) the cost of fixed scheduling; (c) the impact of errors in the timing of the initiation of Paylean^{TM} feeding; and (d) the use of new animal sorting technology. The model determines the most profitable series of diets in terms of live weight growth, carcass composition, and feed conversion for Paylean-fed pigs for different carcass-value-based marketing systems. The model has been used to establish specifications for a series of diets which maximize profitability for pigs fed Paylean^{TM}. Purdue also assisted in the development of a simpler user-friendly version of the computer program which industry technical representatives use to demonstrate the optimal marketing systems to commercial producers. Additional research has begun to evaluate the use of milk replacers prior to weaning to improve the growth of lightweight pigs and reduce the variation in body weight in the late finishing stages of growth. Research has been initiated to estimate the cost of variation of light weight pigs in late finishing and impact of the marketing system's discounting of light weight pigs.

Impact: Purdue Animal Sciences and Agricultural Economics Departments have developed a stochastic swine growth model that can optimize pork production. This is the first swine compositional growth model that has been developed, parameterized, and tied to a multi-variable decision making program. The program demonstrates that marketing strategies can be improved to increase producer profitability. The feeding of Paylean^{TM} can substantially increase the efficiency of swine growth and profitability. However, the benefits of Paylean^{TM} feeding can only be fully achieved with improved feeding and marketing management. Initial research results indicate that the collection of serial live weight and compositional data as well as develop and

implementation of the optimal marketing system via animal sorting technology can result in a $7,000 to $10,000 increase in profitability per 1000 head finishing facility. The optimal use of Paylean™ increased profitability almost an additional $9,000 per year for the 1000 head finisher.

New Molecular Marker for CystX® Will Speed Development of New Soybean Varieties

Description: Commercial development of high-yielding soybean varieties with CystX® resistance to soybean cyst nematode (SCN) has been slowed by the complex genetics of CystX® technology. SCN is the major pest of soybean, widespread in all soybean producing areas including Indiana. It is best managed by planting resistant soybean varieties. Our SCN resistant germ plasm, known as CystX®, can greatly improve SCN management options.
What you have done Breeders have been working for several years to incorporate into high-yielding soybean lines our patented germ plasm (CystX®), which provides complete and broad-based resistance to soybean cyst nematodes (SCN). Five major companies (including Monsanto) currently have CystX® lines in second-year trials. Commercial deployment of CystX® has been slowed, however, by the complex genetics of the CystX® technology. Recently, researchers at Purdue and Indiana Crop Improvement Association, with partial support from the Indiana Soybean Board, discovered and validated a single nucleotide polymorphism (SNP) linked to the major locus of SCN resistance in our germ plasm. This SNP is a single change in soybean DNA that recognizes the most important part of the resistance (major locus) when it is present.

Impact: Purdue researchers patented a germplasm for use in soybeans that provides the crops with complete resistance to soybean cyst nematode (SCN). Introduction of the CystX® germplasm into commercial soybean lines has been slow to occur because of the complex genetics involved, however. Additional research by Purdue and the Indiana Crop Improvement Association identified a molecular marker linked to a major resistance locus of CystX® that can be easily detected in resistant lines. The ability to screen new lines quickly with this marker will save breeders time and labor and increase their efficiency. The discovery of this marker and its easy detection are of significant importance to plant breeders and should speed the incorporation of CystX® resistance into soybean varieties suitable for all of the 60,000,000 acres in the U.S. that are infested with SCN. At current prices this comes to more than $300 millions.

Improving Quality of Indiana's Apple Crop

Description: According to a survey conducted in 2005, the codling moth is the most important insect pest that Indiana's apple growers have to manage. For several decades, apple growers have relied on organophosphate insecticides for managing codling moth and other important insect pests. In 2001 and 2002, there were several reports of control failures with these insecticides. Because resistance had been reported in other states, it was feared that codling moths in Indiana were also developing resistance to these insecticides. One grower reported that he had to discard over 60% of his apples because they were infested with codling moths. He also reported that attempts to use expensive alternative insecticides did not provide adequate levels of control.

Insecticide trials were conducted at the farm of the grower who had reported control problems. The organophosphate insecticide Guthion (azinphosmethyl), which had not provided adequate control in recent years, was tested as well as a number of alternative products. The data collected from that study showed that Guthion provided the best control of all products tested, at a level of control that the grower was very pleased with. Several alternative products also provided excellent control. When we investigated further the reasons for the control failure of the past, we found that the grower had been using reduced rates of the insecticides.

Impact: Through research and extension activities, growers were shown that codling moth could be well controlled on apples using proper rates of common pesticides as well as with several alternative insecticides. Growers were shown that the short term economic benefit of using reduced rates of insecticides can result in very serious long-term economic consequences. Growers were also shown that there are several alternative insecticides that are less toxic that can be used to provide excellent levels of control of codling moth. The grower who previously lost a major portion of his apple crop because of codling moth has reported that in 2004 and 2005 he has achieved almost 100% control of codling moth, resulting in fewer culled apples and higher profits. Growers realized fewer culled fruit and higher profits as a result of this information.

Flowers Lure Good Bugs to Kill Bad Bugs in Landscape

Description: Implementation of biological control in urban landscapes is hampered by lack of information on how to bring natural enemies into the urban matrix. A Purdue Extension Specialist planted flowering plants in an ornamental landscape to determine how they affect the abundance of beneficial insects. The experimental landscape contained a central bed of winter creeper euonymus and either low or high densities of four species of perennial flowering plants that were planted through wood mulch. Control plots included only mulch. The four perennials we used included white clover, euphorbia, coreopsis, and goldenrod. Insect samples were conducted when flowers were in bloom and when they were experimentally manipulated to remove blooms

Impact: An abundance of parasitic wasps and total natural enemies were found to be positively correlated with the biomass of Euphorbia polychroma within plots, and that of all flowering plants combined. This effect occurred, to a lesser extent, when flowers were removed. Results have been published in the International Journal of Biological Control.
These findings provide clear evidence about how actions can be taken to conserve the beneficial insects that reduce the abundance of pests in the landscape. They also provide added motivation for individuals to plant flowers in landscapes.

Delivery of a Weather-Based Spray Advisory Program to Illinois and Indiana

Description: Foliar diseases of muskmelon and watermelon represent potential yield losses for vegetable growers in the Midwest every season. The major foliar diseases of watermelon are anthracnose and gummy stem blight, while Alternaria leaf blight represents the primary threat to muskmelon. At this time, no significant host resistance exists to either of these diseases. While production practices such as crop rotation and fall tillage can mitigate the severity of these diseases, most commercial growers in the Midwest rely on preventive fungicide applications. In a conventional preventative fungicide application program for muskmelon or watermelon, growers rely on a calendar-based application schedule. Most growers apply fungicides on a weekly schedule. Typically, growers transplant into the field in the first week of May. The initial fungicide application occurs by mid-May. Harvest may extend through July for muskmelon and until Labor Day for watermelon. This represents approximately 8 and 14 fungicide applications for muskmelon and watermelon, respectively. The cost of these fungicides represents one of the major expenses to muskmelon and watermelon growers. In an effort to reduce fungicide costs and limit the amount of fungicides in the environment, the MELCAST program was developed at Purdue University. MELCAST is a weather-based spray-advisory program that uses leaf wetness and temperature to quantify the disease potential for a given time period. Instead of using a calendar-based schedule to apply fungicides to muskmelon or watermelon, commercial growers can now use MELCAST Environmental Favorability Index (EFI) values as a weather-based threshold. Purdue University recommends a 35 EFI threshold for the management of both gummy stem blight and anthracnose on watermelon. A 20 EFI schedule is recommended for management of Alternaria leaf blight on muskmelon. In an average year, the MELCAST program saves the commercial watermelon grower 2 to 3 fungicide applications by indicating when fungicide applications are most critical. During the 2003 and 2004 season, the MELCAST program was used in Illinois, Maryland/Delaware, Georgia as well as Indiana. The MELCAST system is currently being tested in Iowa.

Impact: The potential number of fungicides saved can be used to estimate the total impact of this project. In an average year, growers who use MELCAST apply 2 to 3 fewer fungicide applications than if a calendar based system were used. For estimation purposes, let us assume that each one of the 130 growers who received the MELCAST Update saved one fungicide application per season by using MELCAST. This number is probably conservative as many growers saved more than one spray. The total number of acres for the 130 growers is estimated by assuming that each grower has 50 acres of muskmelons and/or watermelons. Some growers have hundreds of acres of cucurbit crops. Therefore, this figure is probably conservative as well. Finally, it is assumed that the ratio of acres sprayed with chlorothalonil to mancozeb were one to one. With this assumption, 6,500 acres for growers using MELCAST in 2003 and 2004 with a combined savings of $60,303 from reduced application of the two fungicides. The MELCAST system will be delivered to the major muskmelon and watermelon growing regions of Indiana and Illinois so that fewer fungicides are applied over a season. In particular, the amount of carbamate fungicides used by muskmelon and watermelon growers in a season will be reduced.

Purdue Income Tax School Teaches Tax Professionals about Tax Changes

Description: In late 2004, Congress enacted the Working Families Tax Relief Act and the American Jobs Creation Act. These Acts impacted individuals, families and businesses. The child tax credit, marriage tax penalty relief, 10% tax bracket and alternative minimum tax relief were provisions were extended. The American Jobs Creation Act made significant changes in the farm income averaging procedures and created a new deduction for income attributable to domestic production activities. The nearly annual changes in income tax law make compliance with the law difficult for individuals and businesses.
Purdue Extension, in cooperation with the Land Grant University Tax Education Foundation, Inc. (LGUTEF Inc.), prepared the 685 page "2004 National Income Tax Workbook" with a 51 page supplement on the American Jobs Creation Act of 2004. Purdue, with cooperation with the Internal Revenue Service and the Indiana Department of Revenue, designed a program using the "National Income Tax Workbook" to update tax professionals on the new law, regulations and procedures. In addition to information enabling taxpayers to comply with the law, educational materials were designed to help individuals understand and evaluate their tax management options. Two-day programs were held in 11 locations in Indiana. In addition, four-hour programs at three locations focused on agricultural tax issues. A two-hour program intended for producers was presented via IP Video. Several shorter presentations were made and supporting publications developed.

Impact: Frequent changes in income tax law and procedures make compliance difficult for individuals, families and small businesses. Purdue Extension, in cooperation with the Internal Revenue Service and the Indiana Department of Revenue taught about 1,100 tax professional about recent changes in income tax law and procedures. These tax professionals estimated that they had prepared over 22,600 Schedule F (farm) and 50,325 Schedule C (non-farm) business tax returns and over 195,000 individual tax returns. The Tax School program was rated as "very good" or "excellent" by 77.8% of the participants and only 2.4% rated the program as less than satisfactory.

Demand for Certified Meat Products

Description: Consumer demand for process verified products appears to be rising, however it is unknown whether consumer willingness to pay exceeds the costs of certifying compliance with process standards. In addition, it is not clear to what extent markets will expand to increase market access for farmers who see dwindling alternatives in the marketplace. Purdue Extension estimated the willingness to pay for natural pork products and determined the potential for market expansion with the introduction of such a certified product. This was done in the context of an assumption of heterogeneity on the part of consumer demand whereas previous theoretical work assumed that all consumers uniformly preferred the certified product. Members of the farm community can find new marketing opportunities in the area of natural pork production if they develop appropriate standards aimed at meeting concerns of consumers and use a third party to verify their compliance with those standards. The analysis was developed into a pilot business

plan used by the Agricultural Innovation and Commercialization Center at Purdue as a model for marketing a process as a product attribute.

Impact: The results of our analysis suggest that there is a large segment of consumers (~43%) who have substantial willingness to pay for antibiotic free, environmentally friendly, and animal welfare certified pork. The results suggest that as much as 62 % of the market could transition to such a product in the long run. Members of the farm community and groups of farmers are beginning to examine the development of standards for similar products. The details of developing standards and the strategies associated with launching such new products with these groups were discussed.