Wisconsin's Cooperative Extension

State Annual Report of Accomplishments and Results for the Agricultural Research, Extension and Education Reform Act (AREERA) for FY 2005

April 28, 2006

Arlen Leholm, Dean and Director
University of Wisconsin-Extension Cooperative Extension
601 Extension Bldg., 432 N. Lake St.
Madison, WI 53706-1498

Voice: (608) 263-2775
Fax: (608) 265-4545
arlen.leholm@ces.uwex.edu
http://www.uwex.edu/ces/

Table of contents

University of Wisconsin-Extension Cooperative Extension, April 2006

1. Programs: National goals

Goal 1: An agricultural system that is highly competitive in the global economy. Through research and education, empower the agricultural system with knowledge that will improve the competitiveness in domestic production, processing, and marketing.

Goal 2: 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.

Goal 3: A healthy, well-nourished population. Through research and education on nutrition and development of more nutritious foods, enable people to make health-promoting choices.

Goal 4: 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.

Goal 5: 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.

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

Executive summary

Situation

Agriculture accounts for $51.5 billion in economic activity annually, provides about 420,000 jobs, and generates 10 percent of Wisconsin's total income. The dairy industry contributes about half of that, yet dairy profitability remains volatile. Much of Wisconsin's dairy farm infrastructure is obsolete. Farmers are looking for affordable ways to increase efficiency and modernize without investing heavily in new facilities. Consumers demand high quality milk from healthy cows. Dairy herds with chronic mastitis and other infections lose out on milk quality premiums, treatment costs, and milk that must be discarded — or cows that must be culled and replaced.

Wisconsin's $3.5 billion annual milk sales depend on adequate supplies of high quality forages and grains. Grazers converting to pasture double their forage yields and triple their net milk profits. The 2005 growing season began dry with only 7 inches of rain in June and July, and 9 days straight record high temperatures. The season finished with a bumper crop of high-moisture corn that needed emergency storage.

Wisconsin's 3.65 million acres of corn, 1.55 million acres of soybeans plus small grains are a $1.5 billion industry. Cash grain profitability is closely linked to crop management decision-making and cost-effective production practices. New and newly adapted insect pests expand their range and numbers. As county UW-Extension educators help prepare for potential Asian soybean rust, their sentinel plot monitoring gives early warning of insect pests and crop health concerns.

Extension response

Since 1998, statewide UW-Extension Cooperative Extension self-directed teams have developed, delivered and evaluated educational programs addressing priority issues. Teams are composed of Cooperative Extension campus and county faculty and staff as well as community, state and national partners sharing the same priorities.

During 2005, Wisconsin's Agriculture and Natural Resources Extension (ANRE) and Community, Natural Resource and Economic Development (CNRED) campus and county faculty and staff continued to address key issues identified with stakeholders. Backed by university research, county educators worked with colleagues and community partners to help farmers and farm support professionals respond quickly to safeguard animal health, adapt and update to stay in business, control voracious new crop pests, unusual weather and market conditions, and anticipate consumer needs in their neighborhood and around the world.

Impacts

A top concern for Wisconsin agriculture is maintaining farm profitability and viability in a highly competitive global economy. While many self-directed teams address this priority, the following teams report program impacts of integrated research and extension education under national Goal 1 during FY 2005.

- Dairy Team improves profitability through research-based education on low-cost and retrofit milking parlors, supporting small farms with timely on-farm dairy planning, best practices and milk quality improvement assistance.
- Emerging Agricultural Markets Team and Community and Economic Development Preparedness Team help establish niche markets through Agriculture Innovation Center business planning, counseling, resources and support to start or expand a value-added business.
- Team Forage and Team Grains conduct on-farm research, field day demonstrations, tours, pasture walks, and seasonal trainings on local topics to help producers increase yields and quality, decrease purchased fertilizers and pesticides. Campus and county faculty and staff use this research-based knowledge to keep grazers, growers, crop consultants and farm support businesses ahead of emerging issues.
- These teams plus the Livestock Team and Helping Youth Understand Agricultural Issues Team work through stakeholder partners, producer meetings, educational programs and fair exhibitor check-ins to help farmers and show animal owners register their premises for rapid response to animal health emergencies.

Total expenditures

By percent of full-time equivalent (fte) and source of funding

FTEs	Smith-Lever Act	State match
49.30	$671,609	$5,094,933

Key Themes: Agricultural Competitiveness, Animal Health, Small Farm Viability

Timely on-farm dairy modernization planning helps mid-career farmers stay in business, improve efficiency

Situation

The dairy industry contributes more than $20.6 billion into the state economy, making dairy profitability critical to economic development. In many cases, staying competitive means replacing aging barns and outdated milking equipment with new structures, technology and practices. About 15,000 dairy farmers with fewer than 200 cows still milk in old-fashioned stanchion or tie stalls.

Many mid- or later-stage career dairy farmers are reluctant to make costly changes to their businesses because of industry uncertainty, and because they feel uncomfortable taking risks. Large capital outlays and off farm labor are commonly used to stay in business, but these are not options for risk-averse farmers. A viable small-farm alternative may be a low cost systems approach to dairy modernization with both low cost housing and milking systems.

Inputs

As these farmers struggle to decide between changing their management, infrastructure and herd size or exiting the business, the statewide UW-Extension Dairy Team Modernization Work Group can help them make informed decisions to achieve their personal and business goals.

For dairy and heifer producers who decide to stay in business, the Dairy Team provides educational materials and programs on adopting best management practices or modernizing the dairy with a more labor efficient system such as a low-cost retrofit milking parlor or freestall barn. Campus and county faculty provide educational programs through workshops, dairy meetings, farm tours, one-on-one farm calls, and on-line or CD-ROM. Dairy Modernization educational Partners include the UW-Madison Center for Dairy Profitability, the Wisconsin Department of Agriculture, Trade and Consumer Protection, and the Wisconsin Department of Commerce-Dairy 2020.

To provide timely personal on-farm support for planning dairy modernization, Crawford County UW-Extension Agriculture Agent Vance Haugen joined Dave Kammel, Center for Dairy Profitability director, to create Rapid Response Teams. After farmers attend a day-long educational session on low-cost retrofitting or remodeling a barn into a milking parlor, they take home what they learned to apply to their farm. If they find they need more information to make decisions, they can ask UW-Extension for help. Two to four educators soon arrive to assess the operation and answer questions so the farmer can make timely decisions and act on them.

Outputs

In 2005, 6,153 dairy producers attended a modernization program or tour sponsored by UW-training, 26 Southwest Wisconsin farmers asked Haugen for Rapid Response Team help Extension. The Dairy Team Modernization Work Group helped 1,804 dairy producers consider modernization options and management practices. After attending a modernization planning low-cost systems. New and retrofit facilities are increasing profitability and easing the back-breaking labor of milking cows.

Impacts

Statewide impacts of FY 2005 low-cost dairy modernization educational programs include:

- 3,931 dairy producers increased their knowledge on modernization options and management practices that may lead to improved profitability or productivity.
- 392 dairy producers determined their business viability.
- 612 dairy producers made a decision on a modernization option based on information and knowledge acquired from Extension, including low-cost parlors, heifer barns, and cow freestall barns.

Southwest Wisconsin: Twenty-six farmers from 11 counties chose to explore low-cost dairy modernization in depth. These farmers worked with their local extension agent and the Rapid Response Team led by Crawford County's Vance Haugen. As a result,

- Six farmers decided to modernize their dairy farms and to consult with Haugen on their planning and building phases farmers reported:
  - — This option was the only one they would have considered given their level of risk aversion.
  - — They would have chosen to exit the business had they not been made aware of low cost alternatives.
- They saved an average $30,000 per milking parlor by using low cost approaches rather than buying turnkey parlors off the shelf.
- All six farmers continue in the business at a profitable level and reduced the amount of on farm labor required.

Southern Wisconsin: County educators Nolan Anderson, Ken Bolton, Mark Mayer and state specialist Dave Kammel speed low-cost dairy modernization support to farmers who ask for help. One producer reports that after installing a low-cost parlor and retrofitting freestalls in the old milk barn with their help:

- The dairy is shipping 1,400 pounds more milk per day and will soon go to everyday pickup.

- They now milk with one person instead of two.
- As herd health improved, somatic cell count (SCC) dropped from a 150,000 to 200,000 range down to 50,000 to 150,000, earning the highest milk quality premium possible from their dairy plant.

Key Themes: Agricultural Profitability, Animal Health

Local milk quality teams make dairy farms more profitable

Situation

Mastitis is the most costly disease of dairy cattle. Mastitis infections lower milk quality, which reduces yields, product shelf life, palatability, and farm income. Producing high quality milk is essential for profitability. Consumers demand milk produced under the most hygienic standards from healthy cows. Commercial buyers measure milk for the somatic cells mastitis infections produce. A somatic cell count less than 250,000 per milliliter (SCC/ml) is generally considered "good" quality. Cheese makers get higher yields and dairy plants pay an incentive premium for top quality milk. Treating mastitis and discarding the milk — or involuntarily culling the cow from the herd — can cost farmers dearly. A specific preventive management plan has been recommended by the National Mastitis Council for nearly three decades, but producers find it hard to follow without on-farm support from service professionals.

Extension response

The statewide Dairy Team Cow Care Work Group, UW-Madison Dairy Science Milk Quality and Safety Department and Wisconsin Milk Marketing Board help dairy producers establish local milk quality teams: County UW-Extension educators work with producers, veterinarians, nutrition consultants, experts on housing and milking equipment, farm service professionals and others to develop a comprehensive approach to improving milk quality. They meet regularly at the dairy farm for 4 months to identify causes of the milk quality problem, consider solutions, make recommendations and evaluate progress. This process builds on the research and Milk Money education program of milk quality specialist Dr. Pamela Ruegg, DVM (UW-Madison / Extension): http://www.uwex.edu/milkquality

Impacts

In 2005, statewide impacts of Dairy Team milk quality education included:

- 3,315 dairy producers and agribusiness professionals learned strategies to better manage their dairy operations.
- 300 dairy producers made changes to their operation to improve milk quality.

Central Wisconsin: UW-Extension Agriculture Agent Matt Lippert worked with a 1,000-cow dairy. The size of the operation multiplies challenges such as changing veterinary practices, retaining workers, incorporating a smaller herd into the main herd, and using methane digester by-product as bedding. The herd was enrolled in the Milk Money program, and a local milk quality team formed including the veterinarian, lender, milk plant field representative, milking equipment supplier, nutritionist, and key employees. The team identified issues such as parlor capacity, milking procedure, cowside mastitis testing, discarding marketable milk, and early identification of problem cows using parlor milk monitoring equipment. During the program, summer herd SCC was only slightly lowered but milking time was reduced and the practice of discarding marketable milk was eliminated. In 1 year, this milk alone will add more than $60,000 to their milk sales.

Kewaunee County: Dairy herds enrolled in the Milk Money program can measure their success with increased profits as a result of improved milk quality. Thirty agriculture professionals who participated as team members were surveyed about the impact of the Milk Money program. Of the 15 survey respondents:

- 14 said a Milk Money team would not have organized without UW-Extension.
- All respondents said they gained information by participating, and shared this information with their clients.

The Milk Money Program builds capacity among farm service professionals who provide ongoing support for preventive mastitis management. And as milk quality improves, the Wisconsin Milk Marketing Board can promote more top quality dairy products globally.

Key Themes: Emerging Agricultural Markets, Niche Markets

Supporting agricultural entrepreneurs developing a value-added business

Situation

From the farmer making goat milk soap for a premium price, to a 500-member ethanol cooperative, Wisconsin producers are venturing into value-added agriculture products and services to increase farm income and diversify their risk. What had been missing was a coordinated statewide effort to support these entrepreneurs.

Inputs

To meet this need, UW-Extension's Emerging Agricultural Markets Team and Community and Economic Preparedness Team partnered with the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) in 2004 to create the Agriculture Innovation Center (AIC). With Michigan State University and Ohio State University, UW-Extension trained and certified 26 Wisconsin agriculture innovation counselors to support entrepreneurs statewide.

The Agriculture Innovation Center opened for business in January 2005, co-directed by Agriculture and Natural Resources Extension Specialist Greg Lawless and Community, Natural Resource and Economic Development specialist Greg Wise with added financial and technical support from the new Wisconsin Entrepreneurs Network (WEN) and Wisconsin Department of Commerce. WEN integrates 50 organizations, including thirteen Small Business Development Centers that offer entrepreneurs help with starting or expanding a business, developing a product or service, finance and accounting, marketing and more. AIC provides access to WEN resources through the 26 counselors, who understand agriculture and establish trusted relationships with farmers in their region.

In 2005, AIC contributed to the following state-wide initiatives:

- Co-director Greg Lawless partnered with USDA and other agencies to promote the Value Added Producer Grant program around the state.
- Co-director Greg Wise served on the Technical Advisory Team for Governor Jim Doyle's Consortium on Bio-based Industry.
- Both Lawless and Wise served as capacity-building advisors to Badger AgVest, and an AIC counselor continues to support their development as an angel network connecting investors with producers adding value to agricultural commodities and services.
- An AIC counselor serves on the Technical Advisory Team for a half million-dollar study commissioned by DATCP to identify Wisconsin's competitive advantage in bio-based manufacturing.

Outputs

In its first year, the Agriculture Innovation Center tested the market for a 10-week business planning course, offering three pilot sessions of the NxLevel “Tilling the Soil of Opportunity.” The 26 certified counselors help course graduates act on their business plans, and provide access in their communities to a growing network of support for entrepreneurs: http://aic.uwex.edu

Impacts

Following the 2005 pilot business planning courses:

- 30 aspiring entrepreneurs from 19 businesses completed the 10-week courses.
- All 19 businesses in the trainings received technical assistance on their business plans from their agriculture innovation counselors.
- 8 agriculture innovation counselors reported 77 direct 1-on-1 teaching contacts.
- 3 of 4 graduates of the Northwest Wisconsin course developed business plans.

- One participant is expanding a business according to plans developed throughout the course.

Capacity-building: Badger AgVest educates agricultural producers about opportunities, connects nascent and expanding value-added businesses with funding, and marshalls resources to create successful self-sustaining agribusinesses. Badger AgVest does not invest in other companies, nor do they recommend investments. Their UW-Extension advisors helped Badger AgVest's board of directors operate in accordance with Securities and Exchange Commission rules by directing them to qualified legal experts, and introduced them to the world of angel investment.

With a grant from UW-Extension's Emerging Agricultural Markets Team, Badger AgVest leaders attended an intensive training on angel investing. "Angel Networks" bring together individuals of wealth who share similar investment goals and who combine their knowledge to locate and evaluate promising opportunities. In 2005, the Badger AgVest board presented two promising firms to their members:

- Virent Energy Systems has developed a process to create hydrogen products from renewable biomass.
- Lucigen Corporation uses highly active enzymes to reduce the costs of ethanol production.

Badger AgVest did not recommend these investments, but did provide information for investors to make their own educated decisions: http://www.badgeragvest.com/

Key Themes: Grazing, Niche Markets, Pasture Management, Small Farm Viability

Managed rotational grazing improves pastures, doubles forage yields, bolsters dairy and livestock profitability

Situation

Wisconsin's $3.5 billion milk sales depend on quality forages. Using pasture as a forage source has increased dramatically on Wisconsin dairy and livestock farms. Statewide surveys show that dairy farmers developing pastures average $2.53 net farm income/per hundredweight (CWT) of milk, while farmers confining cows net a mere 85 cents per CWT.

At least one Wisconsin dairy plant marketing organic milk requires producers to adopt managed intensive rotational grazing (MIRG) — a system in which pastures supply at least part of the forage ration of their milking cows, and these cows move to fresh pasture at least once a week. Dairy farmers whose cattle feed mainly on pasture can tap into a niche market by segregating their milk and marketing it as "Grass-Fed." Meat and dairy products from grass-fed animals have unique flavor and composition, including higher levels of the "good" fats omega 3 and CLA. Such specialty products are marketed to consumers who are concerned about the environment and animal welfare, and who support local family farms.

In a survey by UW Extension's Program on Agricultural Technology Studies (PATS):

- 46% of new dairy farmers plan to use improved pasture to supply feed to their milking herd.
- 44% of established dairy farmers rely on pasture as a source of forage for their milking cows.
- 30% use managed Intensive Rotational Grazing.

Farmers using managed rotational grazing can net more than $1,000 per cow per year even when milk prices are low, and moving from harvesting forage to well-managed pastures can double forage yields.

Inputs

The UW-Extension Team Forage Grazing Work Group provides research-based education on developing and improving pastures, fencing, controlling weeds, over-wintering, and best practices through publications, field days, pasture walks, agent and other agency in-service trainings, on-site and on-line courses, and seminars on topics of local and regional interest. Educational partners include agriculture and conservation professionals, USDA Natural Resource Conservation Service Environmental Quality Incentive Program (NRCS EQIP), UW-River Falls, UW Agriculture Research Stations, technical colleges, local and regional grazing networks composed of dairy, livestock and small ruminant farmers, horse owners, 4-H and FFA (Future Farmers of America). Grazing network members who partner with UW-Extension

- Help develop research and demonstration plots.
- Conduct on-farm research trials.
- Host educational pasture walks, seminars and winter meetings on grazing.

Outputs

Managed grazing is also a top priority for the UW-Extension Livestock Team Cow-Calf Committee. State forage specialist Dennis Cosgrove (UW-River Falls) posts grazing research results and resources at: http://www.uwrf.edu/grazing/

In Central Wisconsin: A group of grass-based dairy farmers approached county UW-Extension agriculture agents Laura Paine (Columbia) and Paul Dietmann (Sauk) for help developing a grass-based dairy processing company. The county educators led fact-gathering tours of dairy industry niche markets, and facilitated meetings with the group of eight farmers from Columbia, Dane, Dodge and Green Counties throughout 2005.

Northwest Wisconsin: Grazing is well-suited for the shorter growing season and lighter soils in Barron, Burnett, Polk, Rusk, Sawyer and Washburn counties. Northwest Wisconsin Grazing Network members expressed a need for information on economical forage legume varieties that thrive in pastures. To meet this need, Washburn County agriculture agent Otto Wiegand helped the network steering committee secure funding from the Grazing Lands Conservation Initiative for technical assistance and education.

In spring 2005, Polk county agriculture agent Ryan Tichich and Spooner area agriculture agent Kevin Schoessow began four on-farm research trials comparing 10 clover varieties inter-seeded into pastures using no-till or frost seeding techniques. Following the 2006 grazing season, the researchers will evaluate each variety's ease of establishment, tolerance to hoof traffic and persistence, and report results on the UW-Extension Focus on Forage website: http://www.uwex.edu/ces/crops/uwforage/FocusonForage.htm

Western Wisconsin: Juneau County UW-Extension educator Craig Saxe provides grazing education through the Living off the Land Grazers, a collaborative effort among Juneau County Economic Development Corp, Juneau County UW-Extension, USDA Natural Resources Conservation Service (NRCS), Wisconsin Organic Marketing Alliance Cooperative and, Western Wisconsin Technical College.). Six additional events/projects have occurred as a result of the Living Off the Land Grazers efforts including: an entrepreneurs workshop 'Shaking the Money Tree', an Organic Basics workshop, a fall grazing workshop, a grazing forage variety trial, 'A Taste of Country' public awareness event and a beef consumer educational event.

Southwest Wisconsin: For the hilly UW Lancaster Summer Pastures Field Day, Iowa County UW-Extension agriculture agent Rhonda Gildersleeve secured Great Lakes Conservation Initiative grant support to host Dr. Gene Felton, a ruminant nutritionist from West Virginia University. Dr. Felton and state beef specialist Jeff Lehmkuhler presented practical applications of research results from UW Lancaster and other states. Forage specialist Geoff Brink of the USDA Dairy Forage Research Center presented a session on grass and legume species selection in the field.

Aggressive weeds such as garlic mustard, thistles, and wild parsnip, along with brush species such as multiflora rose, prickly ash and buckthorn in pastures and woodlands are a major cause for concern among farmers, rural landowners and conservation agencies. Peggy Compton, UW-Extension basin educator in the Grant-Platte and Sugar-Pecatonica (GPSP) river basins, coordinated field days led by state Weed science specialist Jerry Doll (UW-Madison / Extension) in four GPSP basin counties. Local partners included Iowa County UW-Extension agriculture Agent Rhonda Gildersleeve and community resource development Educator Paul Ohlrogge; Lafayette County conservationist Lisa Trumble and Department of Natural Resources (DNR) wildlife biologist Bruce Folley; Green County agriculture Agent Mark Mayer; and Grant County crops and soils agent Ted Bay.

Field days covered local concerns such as thistles, multiflora rose, wild parsnip, and prickly ash biology, plant control options, equipment demonstrations and discussions on treatment effectiveness.

Compton distributed 3,000 copies of The Dirty Dozen and Beyond: pasture weed identification and management booklets in spring 2005, and 10,000 more were printed for distribution to UW-Extension basin educators, county UW-Extension offices and conservation professionals.

Impacts

Grazing education impacts during 2005 include:

- 545 more acres of pastureland were enrolled in USDA NRCS Environmental Quality Incentive Program cost-sharing for establishing managed intensive rotational grazing, using grazing plans for individual farms developed with Marquette County UW-Extension crops and soils agent Keith Vander Velde.
- 214 producers attending 5 spring on-farm beef cow-calf seminars learned about effective managed grazing systems, and premise identification and registration. A follow up sample survey 9 months later shows that in the grazing area:

  — 13 cow-calf producers implemented managed rotational grazing systems as a result of the program.

  — 8 producers plan to frost seed renovated pastures in 2006.

Central Wisconsin: A group of 8 dairy farmers completed a business planning process, which included developing a vision for their value-added project, soliciting both financial and technical support, gaining knowledge of artisan cheese-makers, dairy processing and retail, and making and acting on decisions for establishing their grass-based dairy processing business.

Northwest Wisconsin: 250 dairy, beef, horse, llama and poultry owners attended six on-farm pasture walks, and examined first-year results of inter-seeding clover in different soils and pasture management systems.

- 40 producers attending an on-farm cow-calf seminar learned about managed grazing.
- 80 Northern Wisconsin Beef Association members learned about managed rotational grazing in Sawyer County.
- 5 managed intensive rotational grazing plans were written in Sawyer County, and 1 in Washburn County.

Southwest Wisconsin: 700 farmers, landowners, and agency staff attending educational programs, pasture walks and field day presentations learned about pasture renovation, effective pasture management, weed control, and nutrient management for organic grazing farms.

- 50 participants at the Winter Pastures Seminar in Mineral Point learned about soil compaction, out-wintering, and multi-species grazing. Of the 38 who completed an evaluation questionnaire:

  — 94% said they received new information and ideas for their own farm.

  — 90% rated the usefulness of the information as very good to excellent.

- 50 producers attending the UW Lancaster Summer Pastures Field Day learned about best management practices and species selection for proper land stewardship on hillsides.

- 40 beef producers learned about UW-Extension grazing resources and how managed grazing fits into beef production systems from a farmer-to-farmer panel organized for the Wisconsin Cattlemen's Winter Conference.

- **Western Wisconsin:** 300 participants attended seven pasture walks held throughout Juneau County.

  — 95% of participants at a pasture walk rated the program as excellent or very good.

  — 85% of participants indicated "considerable increase" or "some increase in their knowledge about managed intensive grazing.

  — 80% indicated that they were "very likely" or "likely" to put to use what they had learned about managed intensive rotational grazing.

- 12 participants at a horse grazing workshop improved their ability to manage grass, identify pasture grasses, control pasture weeds, and compare fencing options

Key Themes: Plant Health, Plant Production Efficiency; Other: Integrated Pest Management

Monitoring sentinel plots for Asian soybean rust gives growers early warning on pests and health concerns

Situation

Asian soybean rust (Phakospora pachyrizi) fungal disease was first reported in the continental United States during November 2004. Some countries where this disease has invaded have reported yield losses of 10 to 80 percent. Soybean rust must over winter on living plant foliage, so experts assume soybean rust will not survive the Wisconsin winter. However, wind could bring the spores from the south where perennial weeds harbor them, spreading the spores rapidly over long distances.

Inputs

The statewide UW-Extension Team Grains Integrated Pest Management (IPM) Work Group responded to the threat of Asian soybean rust by joining a national network to give growers early warnings. The network uses soybean rust sentinel plots to monitor and track soybean rust movement and development nationwide. This information is critical to soybean growers. Monitoring can prevent fungicide applications when rust is not found. If soybean rust is detected, crop specialists can prepare IPM management recommendations based on environmental conditions, crop stage, and the use of preventive or curative fungicides.

Outputs

Team Grains IPM work group provides educational outreach on effectively managing pests and diseases, so producers can make sound decisions on scouting methods, economic thresholds, seed treatments, foliar insecticide timing, fungicide applications, planting dates, herbicide stewardship, crop rotation length and diversity.

During the 2005 growing season, UW-Extension campus and county faculty and staff established and regularly monitored soybean rust sentinel plots. Researchers designed the sampling protocol to detect soybean rust at less than 5 percent. Participating counties included: Adams, Buffalo, Columbia, Dane (2 sites), Dodge, Grant/Rock (2 sites), Green Lake, Jefferson/Sheboygan (2 sites), Marinette, Monroe, Outagamie, Pierce, St. Croix, Vernon, Walworth and Wood Counties.

While Asian soybean rust was not detected in 2005, sentinel plots provided valuable early warning of two-spotted spider mites and soybean aphids. New or newly adapted crop pests recently emerging in Wisconsin include the soybean aphid-virus pest complex, bean leaf beetle, Variant Western Corn Rootworm (VWCR), and glyphosate-tolerant weed escapes. Early warnings through sentinel plot monitoring and crop scouting are critical for balancing costs and benefits of fungicide and pesticide applications — both for controlling emerging diseases and pest complexes and for preventing unnecessary treatments.

Wisconsin Sentinel Plot findings were disseminated through the UW Plant Pathogen Detection Clinics toll free helpline — (866) RUST411 (866-787-8411) and on state and national websites including:

- UW Soybean Health website, http://www.plantpath.wisc.edu/soyhealth/
- U.S. Department of Agriculture soybean rust website, http://www.usda.gov/soybeanrust/

Impacts

Statewide impacts of Team Grains Integrated Pest Management education during 2005 include:

- 76 farmers, agronomists and farm support professionals at a Pest Management Update Meeting learned about the latest research and pest management strategies, problem weeds, diseases, insects, new techniques and products to manage them from UW-Extension weed specialist Chris Boerboom, plant pathologist Craig Grau, field crops entomologist Eileen Cullen, and Chippewa County crops and soils agent Jerry Clark.
- The plant disease diagnostic clinic saw a three fold increase in soybean samples in the 2005 growing season, making soybean the most commonly submitted sample for the first time.
- County educators statewide indicated an increase of producer awareness of soybean plant foliar health through in-person discussions and phone calls with producers.

Dane County: Leading the state in soybean production, Dane County growers were very concerned when Asian soybean rust was discovered in the United States. Dane county educator David Fischer established a soybean rust sentinel plot for the 2005 growing season. Fischer used the results of his routine sampling to inform producers and farm support professionals about insect pests detected and the status of other soybean health concerns. Wisconsin Farm Report used Fischer's findings in their weekly broadcasts to Southern Wisconsin producers.

Integrated Pest Management balances production costs with benefits of profitability and environmental stewardship. Using a very conservative estimate based on 2004 statistics — 1.55 million acres of soybeans yielding an average 35 bushels per acre and selling for $5 per bushel — IPM Program state specialist Bryan Jensen calculates that losing even the minimum 10 percent of their crop to rust would cost Wisconsin growers in the neighborhood of $27 million. Given the results of sentinel plot monitoring, the lack of Asian soybean rust meant Dane County producers did not need to apply fungicides to more than 80,000 acres of soybeans. Estimating that fungicide application would have cost $20 per acre, knowing they would not need preventive treatment saved Dane County producers $1.6 million.

Key Theme: Animal Health

Helping register all dairy, livestock and poultry sites for rapid response to animal health emergencies

Situation

The Wisconsin Livestock Premise Identification and Registration Program became law in 2005. All farms and fairgrounds with one or more animals or birds on their property for 24 hours or more must now register their site. This is the first step of an evolving nationwide program to help protect animal health and food supply security. Premise registration will facilitate rapid response to animal disease emergencies.

The new law applies to all dairy, livestock and poultry producers and animal exhibitors, including full- and part-time conventional producers, 4-H and FFA (Future Farmers of America) animal project members, hobby farmers, and animal enthusiasts. Local, regional and state fairs will also be required to obtain a premise identification and eventually participate in the animal movement portion of the proposed National Animal Identification system.

Inputs

In 2005, UW-Extension statewide premise ID and registration education and assistance for agricultural producers and fair exhibitors included:

- Dairy Team Modernization Work Group
  - — Provided producers registration information and assistance in person at meetings, workshops and educational events.
  - — Collaborated with stakeholder partners, producer organizations, farm support professionals and the media — farm radio and newsletters, local and statewide newspapers.
- Livestock Team Beef Cow-Calf Committee and state beef specialist Jeffrey W. Lehmkuhler (UW-Madison / Extension):
  - — Answered producers' questions at two cow-calf seminar series at five locations around the state, with support from Wisconsin Beef Producers associations.
  - — Collaborated with producers, fair boards and other stakeholder partners to evaluate a proposed animal identification technology.
- Helping Youth Understand Agricultural Issues Team
  - — Taught premise identification and registration through Pork Quality Assurance and Beef Quality Assurance trainings statewide and to fair exhibitors on-site.

Most county educators reported premise identification and registration as a topic for workshops, seminars and clinics statewide.

Outputs

UW-Extension campus and county faculty provided educational support for premise identification and registration through comprehensive statewide information and assistance. This included face-to-face meetings with producers and exhibitors, presentations to professional organizations, youth trainings and other formal education, newsletter and newspaper articles, farm radio programs, public events and office phone calls.

The Wisconsin Livestock Identification Consortium awarded USDA funds to the Wisconsin Cattlemen's Association (WCA) for a project to investigate the use of radio frequency identification device (RFID) technology for exhibition steers.

The Livestock team and Lehmkuhler helped WCA write the grant proposal and implement the project — placing RFID ear tags in all steers arriving at all state fair check-in sites in addition to all steers exhibited at the Grant, Iowa, Outagamie, Richland, and Rock county fairs. Nearly 1,000 steers were identified with RFID tags provided through this project. Partners included WCA, UW-Extension, Global Animal Management (software service provider), Global Vet Link (on-line certificate of veterinarian inspection provider), Wisconsin State Fair Park, and local county fair boards.

Impacts

From evaluating success of the proposed animal identification technology, UW-Extension and WCA determined that using RFID tags appears to be a feasible method for identifying cattle going to exhibitions but is not faultless: Exhibitors responding to a survey reported:

- Most show cattle retain their tags, but not 100 percent.
- Nine steers developed an infection around the site of administration.
- Neutral or better acceptance of the ID device for animal identification — 3.2 to 4.0 on a 5-point scale, with 5 the highest.
- Moderate to high importance for the livestock show industry as a National Animal Identification System is developed — 3.5 to 4.6 on a 5-point scale.

While statewide livestock premise registration totals were not yet available by the end of 2005, two counties reported interim results.

Chippewa County: More than 250 conventional producers, 4-H and FFA members, parents, and hobby farmers attending face-to-face meetings learned about reasons for the law, requirements and how to register their premises. Ninety agricultural lenders and other agri-business professionals learned about the law at the Western Wisconsin Ag Lenders conference. Numerous producers call on county UW-Extension educator Randy Knapp for premise ID information. Premises ID posters and announcements were displayed and distributed at the Northern Wisconsin State Fair. More than 900 Chippewa County premises were registered in 2005.

Waupaca County: UW-Extension agriculture agent Greg Blonde provided premise registration information to hundreds of farmers and homeowners through direct contact, youth livestock trainings, office phone calls and on-farm visits as well as proactive educational outreach. For many of those part-time or hobby farmers who contacted Blonde directly with questions about the premise ID program, this was their first contact ever with UW-Extension. An estimated 300 to 400 Waupaca County farms have been registered.

As the industry continues to develop a national animal identification system, UW-Extension will continue to provide producers and stakeholders timely education and assistance for complying with new and revised requirements.

Evaluation of the success of multi-state and joint activities

Key Theme: Emerging Agricultural Markets, Niche Markets

Adding value to agricultural commodities, strengthening the industry

In 2005, AIC co-directors Greg Lawless and Greg Wise arranged follow-up training in Michigan for agriculture Innovation counselors, many of whom are Emerging Agricultural Markets Team members. The center also coordinated professional development for AIC counselors at the National Value Added Agriculture Conference in Indiana.

FY 2005 participation: Greg Wise 0.05 fte, Greg Lawless 0.10 fte.

Four-state dairy education: Wisconsin, Minnesota, Iowa and Illinois gathered more than 400 dairy industry and academic professionals to share research findings at the 4-State Dairy Nutrition Conference in Dubuque, Iowa, in June 2005. Bob Kaiser (UW-Madison / Extension) reported his first-year field research findings from analyzing nutritional content of distillers' wet grains with Solubles (DWGS), a growing by-product of making ethanol fuel from corn, usually considered a bargain dairy feed. Kaiser also entered the nutritional values in a database, generating discussion among ethanol plant managers, dairy producers, nutritionists, feed and forage lab managers: http://www.wisc.edu/dysci/

Outreach scholarship: Kaiser, Robert, June 2005. Variation in Composition of Distillers Wet Grains with Solubles, paper presented at the Four-State Dairy Nutrition and Management Conference, Dubuque, Iowa.

FY 2005 participation: Bob Kaiser 0.10 fte, Randy Shaver 0.10 fte.

Four-state livestock education: Wisconsin, Minnesota, Iowa and Illinois Cooperative Extension program leaders created this collaboration in August 2004. Specialists and agents formed beef and swine programming teams and have been sharing educational materials that shaped their work during 2005.

FY 2005 participation: Rick Klemme 0.05 fte.

Wisconsin and Minnesota Ag Engineering Newsletter is published four times a year, connecting professional agriculture engineers, county agriculture agents and other colleagues from both states, saving time and resources.

FY 2005 participation: Ron Schuler 0.05 fte, Dave Kammel 0.05 fte, Brian Holmes 0.05 fte, Doug Reinemann 0.05 fte

The Minnesota Beef School is a distance education program that reaches into Wisconsin. Three Wisconsin agriculture agents advise about 40 Wisconsin participants in the Minnesota Beef Schools correspondence course. Marquette County agriculture agent Keith Vander Velde wrote a chapter on beef reproductive health for the course.

Participation: Mahlon Peterson — 0.05 fte, Rhonda Gildersleeve — 0.05 fte, Keith Vander Velde — 0.05 fte

The Great Lakes Grazing Network Grazing Dairy Financial Data project is an ongoing effort to gather financial data on grazing dairy farms under many different management practices. Participating states include: Illinois, Indiana, Iowa, Michigan, Missouri, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin. The Canadian province of Ontario is also involved. First and second year project reports as well as five fact sheets derived from the reports have been completed and are available at http://cdp.wisc.edu

Participation: Tom Kriegl 0.66 fte

A consortium consisting of Extension and Research faculty and staff in Iowa, North Dakota, South Dakota, Minnesota and Wisconsin are integrating research, extension, and education activities to address economic, social and ethical issues associated with agricultural biotechnology. The research portion of the project examines determinants of product adoption, consumer behavior, industry response, product regulation, intellectual property rights, values influencing consumer and producer decisions, and producer and consumer attitudes toward acceptance or rejection of agricultural biotechnology. Findings are being used in developing extension and educational materials for diverse audiences to help them understand the benefits and risks associated with agricultural biotechnology.

FY 2005 participation: Ken Smith 0.20 fte, Brad Barham 0.05 fte,
Tom Zinnen 0.05 fte, Mohammad Douglah 0.05 fte

Goal 1

Evidence: Campus and county-based faculty and staff report their work against desired outcomes through Cooperative Extension's Planning and Results System (PRS). They also submit more detailed success stories of their work for the PRS database.

Goal 2: A safe and secure food and fiber system

Executive summary

Situation

Foodborne illness remains a serious health concern, especially among pregnant or breastfeeding women, young children, and older adults. Food safety guidelines add more cautions each year, and outbreaks often make the news. Effective education is critical so consumers choose, handle, prepare and store food safely for the entire household, and so food processors are fully trained and able to implement federally mandated food safety programs.

Testing drinking water for arsenic is a high public health priority, and an added cost for Wisconsin's 800,000 well owners. Since the U.S. Environmental Protection Agency (EPA) cut the acceptable amount of arsenic in drinking water, unsafe levels of naturally occurring arsenic are now found statewide — some are the highest amounts recorded in the world. Health studies found so many contaminated wells in the Fox River Valley region of Northeast Wisconsin that the Department of Natural Resources (DNR) declared the counties of Outagamie and Winnebago through the western half of Brown County as an Arsenic Advisory Area. While the Centers for Disease Control and Prevention require testing for arsenic in public wells under the Clean Water Act, private wells are the owners' responsibility as legal custodian of their water system.

Extension response

During 2005, the UW-Extension Cooperative Extension Family Living Programs (FLP) statewide self-directed Eating Well and Staying Active Team continued to address key food safety issues identified with stakeholder partners. Community-based nutrition educators and coordinators continued to reach under-served and under-represented low-income pregnant women, caretakers of infants, children, youth, families and older adults. UW-Extension food safety education targets consumers, food industry personnel and allied stakeholder partners with the following intended outcomes:

- Communities will encourage and support the safety of food and water for all consumers.
- Individuals/families will choose, handle, prepare and store food safely.
- Food processors and food industry personnel will produce safe, high quality food for consumers..

Backed by university research, UW-Extension campus and county faculty and staff work with colleagues and community partners to respond to emerging food safety and food quality needs. Educational materials are reviewed and adapted to address diverse cultural needs in English and Spanish — and maintain food safety recommendations consistent with the national Fight Bac / Combata a Bac™ campaign of five steps to food safety.

The Wisconsin Nutrition Education Program (WNEP) responds to the diverse needs and resources of individuals and families by implementing community-based nutrition education programs. During 2005, WNEP entered into 1,540 agreements with 884 partner agencies to provide community nutrition education to Food Stamp-eligible individuals and families. More than half of these agreements (56%) led to in-kind matching support, in accordance with program guidelines.

With these community partners, WNEP operated as 39 projects in 59 Wisconsin counties. Nutrition educators made 345,184 educational contacts with Food Stamp-eligible individuals and families statewide. Of all learners during 2005:

- 60% were women and girls.
- 46% were school-age youth.
- 24% were families with young children.
- 20% were adults age 65 or older.
- 7% were childless adults between ages 18 and 65.
- 3% were pregnant women.

More than three-fourths of low-income participants were white (77%). Community-based educators reached out to under-served culturally diverse individuals and families most at risk

- 10% of learners were African American.
- 10% were identified as Hispanic or Latino/a.
- 4% were American Indian.
- 3% were Asian American.

In rural Northern and Western Wisconsin, UW-Extension nutrition educators develop programs to meet the needs of isolated learners with little access to community services.

Responding to the critical need for information and assistance in the Fox River Valley, Cooperative Extension geologists and hydro-geologists initiated basic and applied research to identify arsenic sources, map both bedrock and shallow aquifers where arsenic naturally occurs, work with regulators and well drillers to ensure safe drinking water, and support county faculty engaging local officials in protecting water resources. Wisconsin Geological and Natural History Survey (WGNHS) state specialists, the Central Wisconsin Groundwater Center at UW-Stevens Point, county community resource development and basin educators work with local government, public health and state regulatory staff to develop well testing education, help well owners weigh safe drinking water options, and include groundwater in comprehensive land use planning.

Impacts

More than 24,400 learners received food safety lessons from community nutrition educators and coordinators in 2005, accounting for 40,632 teaching contacts through multi-session and one-time groups, and through learn-while-you-wait education. The FLP statewide self-directed Eating Well and Being Active Team and WNEP Food Stamp Nutrition Education report the following FY 2005 impacts of food safety and food quality integrated research and education as well as multi-state and joint activities under National Goal 2 Key Themes.

Wisconsin Geological and Natural History Survey (WGNHS) state specialists and the Community, Natural Resource and Economic Development (CNRED) self-directed Community Planning and Plan Implementation Team report the impacts of integrated research and extension education as well as collaborative progress and strategies toward assuring safe drinking water for thousands of owners of private wells with unsafe levels of arsenic.

Total expenditures

By FTEs and source of funding

	FTEs	Smith-Lever	State match	FSNE match
Smith-Lever	5.95	$81,056	$614,906	—---
EFNEP/ FSNE	11.95	$162,794	$590,306	$590,306

Key Themes: Food Safety; Other: Under-Served and Under-Represented Populations

Low-income school-age youth and older adults learn the basics of keeping food safe to eat

Situation

Food safety is important to everyone. Pregnant women, infants and young children, and older adults are especially susceptible to foodborne illness. While proper hand washing can prevent many illnesses, very few individuals or caregivers take time for even this simple preventive measure.

University of Wisconsin-Extension Cooperative Extension has the research-base, expertise, networks and culturally appropriate educational materials to help low-income children, youth, families and older adults learn the basics of keeping food safe to eat.

Inputs

The Wisconsin Nutrition Education Program (WNEP) is two federally funded nutrition education programs serving low-income individuals and families, a partnership of the U.S. Department of Agriculture Food and Nutrition Services, Wisconsin Department of Health and Family Services, and University of Wisconsin-Extension. UW-Extension Cooperative Extension campus and county faculty and staff teach safe food handling, preparation and storage practices so people of all ages can choose, handle, prepare and store food that is safe to eat.

Research-based educational programs use safe food handling messages consistent with the national Fight BAC / Combata a Bac™ campaign, providing consumers five brief, positive actions to reduce their risk of foodborne illness:

1. Clean: Wash hands and surfaces often.
2. Separate: Prevent cross-contamination.
3. Cook: Cook or reheat foods to proper temperatures.
4. Chill: Keep cold foods cold and cool leftovers promptly.
5. Store: Store food properly to prevent illness.

Outputs

Food safety education is an integral part of WNEP Food Stamp Nutrition Education (FSNE). More than 24,400 learners received food safety lessons from UW-Extension FSNE educators, accounting for 40,632 teaching contacts offered in partnership with WIC — Women, Infants and Children clinics, public and tribal health offices, Head Start, schools (K-12), and senior meal sites and programs. Easy-to-read educational materials are culturally reviewed and adapted to address the needs of diverse learners, in English and Spanish.

In FY 2005, the two primary audiences for food safety education were youth ages 5 to 11 at schools where at least half of students are eligible for free or reduced-price School Meal programs, and adults age 65 and older. Community-based nutrition educators reached 7,364 youth learners ages 5 to 11, 10,386 older adult learners, and families with young children were an important audience as well (7,084 learners). Older youth (ages 12 to 17), adults without children, pregnant women and caretakers of infants also received food safety lessons.

Impacts

Evaluation results indicate that UW-Extension FSNE was effective in motivating school-age youth to practice food safety. For youth audiences impact evaluation of food safety lessons is measured by changes between self-reported responses to pre- and post-lesson assessment using a set of questions for each lesson's objectives and written for the age of the students. Youth ages 5 to 11 learned food safety at school, libraries, public and tribal health offices, neighborhood centers, summer feeding sites, Head Start and community action agencies.

For youth ages 5 to 11, FY 2005 food safety lesson impacts include.

- 83% of about 1700 students knew before lessons that they should wash their hands before preparing a sandwich
  95% identified the correct response after the lessons.
- 56% of about 2700 students could identify how to wash their hands properly before the lessons
  87% knew the correct response after the lessons.

Key Themes: Other: Arsenic, Drinking Water Safety

Tracking, mapping and regulating arsenic sources to ensure drinking water safety

Situation

In 2001, the U.S. Environmental Protection Agency (EPA) cut by 80 percent the amount of arsenic allowed in drinking water — from 50 parts per billion (ppb) to 10 ppb — a concentration similar to 10 drops of water in an Olympic-size swimming pool. EPA classifies arsenic as a carcinogen. Prolonged exposure increases risk of skin cancer and tumors of the kidney, prostate, bladder, liver and lungs. Arsenic also increases risk of blood vessel damage, hypertension, nerve damage, diabetes, anemia, digestive problems, depression, and changes in skin color and texture. With less arsenic allowed in drinking water, unsafe levels of naturally occurring arsenic are found in wells statewide, raising concern for Wisconsin's 800,000 private well owners. Wells with unsafe arsenic concentrations commonly contain high levels of iron, sulfate and other heavy metals such as cobalt, molybdenum, vanadium, cadmium, chromium, copper, and nickel. Health studies found so many contaminated wells in the Fox River Valley that the Department of Natural Resources (DNR) declared Outagamie, Winnebago and the western half of Brown County as an Arsenic Advisory Area and set protective well construction guidelines.

While public wells are monitored for drinking water safety under EPA rules, private wells are the owners' responsibility as legal custodian of their water system. Three-fourths of well owners responding to a Central Wisconsin Groundwater Center survey reported they had not tested their drinking water in the last 5 years. Water testing labs report few are willing to pay the extra cost to test for arsenic and associated toxic metals above the amount to test for bacteria and nitrates. Likewise, well drillers were reluctant to follow voluntary protective well construction guidelines because of the added costs, in particular the rising cost of steel well casing. DNR staff had been working with UW-Extension outreach specialist Madeline Gotkowitz, assistant professor of environmental sciences and hydrogeologist with the Wisconsin Geological and Natural History Survey (WGNHS). She had conducted basic and applied research to identify the source of arsenic contamination and safe drinking water options for the Woods School near Lake Geneva in Southeast Wisconsin. The DNR called on her again to help develop new recommendations for well protection in the Northeast Wisconsin Arsenic Advisory Area.

Inputs

A statewide group of experts formed to study the serious health, economic and regulatory issues of unsafe drinking water, develop strategies to manage arsenic contamination, protect wells and reduce health hazards. Led by the DNR Drinking Water and Groundwater Bureau, this partnership includes UW-Extension Cooperative Extension researchers, campus and county faculty including WGNHS and the Central Wisconsin Groundwater Center at UW-Stevens Point, DHFS and other state agencies, county and tribal health departments, the National Institutes of Health, U.S. Geological Survey, and the Wisconsin Water Well Association. The joint DNR and UW Groundwater Coordinating Council review educational materials to ensure consistent messages.

Funded by DNR, Gotkowitz collaborated in her research with J.A. Simo, professor of geology and geophysics, UW-Madison, and Madeline Schreiber, hydrogeologist and assistant professor of geological sciences at Virginia Tech. A study of more than 3,300 private wells had found one well in five (20 percent) with arsenic levels above the new EPA standard, and 3 percent of those well above the previous standard of 50 ppb. Armed with these findings, Gotkowitz set out to discover the geologic and geochemical controls that release both low and high levels of arsenic into wells in the Arsenic Advisory Area.

Gotkowitz examined drill cores and cuttings, sampled mineralized zones, analyzed for key metals and minerals, recorded their geographic distribution in the St. Peter sandstone, and related that information to arsenic distribution in the aquifer. She evaluated regional groundwater geochemistry data for conditions that trigger chemical reactions releasing arsenic. She also conducted a field study to compare and contrast water quality and hydrogeologic conditions at wells with high and low arsenic levels.

Gotkowitz found that arsenic levels in drinking water are high where well bore holes allow air in to oxidize sulfide minerals. Overall, high arsenic concentrations cluster from south to north along the Fox River Valley where wells are drilled through sulfide mineral pockets in the St. Peter sandstone bedrock. Although using chlorine to disinfect wells can oxidize iron sulfide in aquifer sediments and release arsenic, chlorination may be critical at limiting arsenic contamination in settings similar to the field study site. In the high arsenic comparison well, Gotkowitz found that microbes introduced through the well bore hole facilitate iron cycling and release arsenic. By ridding the well of active microbiological communities, chlorination may reduce arsenic levels in such settings.

Two distinct geochemical mechanisms appear to contribute low to moderate arsenic concentrations (up to 50 ppb) to well water in this aquifer:

1. Oxidation of sulfide minerals may release arsenic to groundwater in confined portions of the aquifer. Oxidation may have occurred in the geologic past, or current levels of oxygen dissolved in groundwater may permit slow oxidation.

2. Under typical domestic water use patterns, increasing water use per person and more private wells in the aquifer contribute to draw-down of the water table that exposes sulfide minerals to oxygen, dissolves iron sulfides and releases arsenic.

Gotkowitz's research shows how conditions releasing arsenic in the Fox River Valley differ sharply from what she found in the sand and gravel aquifer near the Woods School in the glacial deposits of Southeast Wisconsin. In Northeast Wisconsin, arsenic is released when sulfide mineral deposits in St. Peter sandstone outcrops are exposed to oxygen, microbes and weathering. In the relatively old water in Southeast Wisconsin, arsenic is bound to iron hydroxide minerals dispersed throughout the aquifer and released with very little oxygen. She concludes that the only way for a private well owner anywhere in the state to know the arsenic level in their drinking water is to have their well water tested regularly by a certified lab. Gotkowitz has now begun working with Iowa County community resource development educator Paul Ohlrogge on arsenic problems in Southwest Wisconsin.

As Gotkowitz concentrated her research on the geochemical conditions and processes releasing arsenic in wells and aquifers, her WGNHS colleagues Bruce A. Brown and Tom Hooyer were mapping the bedrock and glacial deposits under Outagamie and Winnebago counties. To map bedrock depth, thickness and character, Brown and DNR geologist Dave Johnson examined and interpreted more than 4,000 well construction reports in the Arsenic Advisory Area. Combining that information with 6,000 regional well-drilling records in the WGNHS database, they mapped the depth to bedrock aquifers and the extent of the St. Peter sandstone, which they found highly variable in thickness. Brown and Johnson were able to assemble and interpret the geology within 1 year thanks to a new method of matching DNR well reports to county address data. This new technique, developed by WGNHS senior cartographer Mike Czechanski, GIS specialist Peter Schoephoester and DNR's Dave Johnson cut by months the time and effort to get from raw well data to a database the geologists can work with.

Mark Putra, DNR Private Drinking Water section chief, calls their efforts a "great exercise in historical detective work." Reading a well construction report is not like reading a recipe — well drillers use different terms for the same thing, and interpretation requires experience. Once the well locations are confirmed, the elevations established and geologic interpretations made, the resulting geographic information system (GIS) becomes a powerful tool for planning and analyzing resources.

From these studies and those by Gotkowitz on arsenic release mechanisms, DNR concluded that special well construction techniques are required in Outagamie and Winnebago counties. The GIS was used to generate maps showing depth to the St. Peter and Cambrian sandstone bedrock layers. Wells must be completed above the St. Peter or into the deep Cambrian aquifer to avoid arsenic-releasing sulfide mineral deposits in the St. Peter sandstone. To make these maps easy for well drillers to use, minimum and maximum depths were assigned by quarter section throughout both counties. One year later, the maps are being improved and drillers report this system is working, resulting in more arsenic-free wells.

For some rural wells with unsafe arsenic levels, an affordable solution may be a shallow sand and gravel well.

To help DNR identify sand and gravel aquifers, critical groundwater recharge areas, and areas unsuitable for certain land use such as land fills, WGNHS quaternary geologists Tom Hooyer and John Attig set out to map the Fox River Valley lowlands. To do this, Hooyer and Attig divided the basin of glacial Lake Oshkosh into three sections for mapping. They mapped the distribution of Ice Age silt and clay sediments, sand bars, shoreline features, deltas, beaches, and more than 600 dunes, and determined depth to bedrock through 14 counties, taking 2 years for each map section. Glacial Lake Oshkosh drained and refilled at least twice with the advancing and receding glacier from 20,000 to 10,000 years ago, the second era of the 1.6 million year Quaternary Period.

Hooyer secured 6 years of research funding from the National Geologic Mapping Program that also funded Brown's bedrock study, and American Association of State Geologists yearly funding to mentor undergraduate field researchers who help map, drill and compile data. Their first steps are to evaluate aerial photographs, water well records and county soil surveys for each map section. He and Bruce Brown used their geologic mapping to develop a field guide and conduct a geology tour of Outagamie and Winnebago counties with community resource development educator Catherine Neiswender for local and county zoning officials and planning commissioners. Hooyer projects map completion by 2007. WGNHS has released his preliminary maps and those of Brown as open-file reports.

Outputs

When Madeline Gotkowitz presented her research on arsenic in the Fox River Valley, her recommendations along with the maps created by Brown and cooperators provided the science supporting new well construction requirements and methods for the Arsenic Advisory Area. Gotkowitz helped DNR staff write the new rules and also reviewed them. Mark Putra reports that based on WGNHS research, bedrock maps and discussions with Gotkowitz and Brown, the DNR Drinking Water and Groundwater Bureau changed the Arsenic Advisory Area into a special well casing depth area covering 2 counties — the largest special casing area ever, and the first since the 1970s. For Outagamie and Winnebago counties, the new rules guide well drillers to safe drinking water, regulate depth of casing to go below arsenic bearing sandstone and require specific drilling methods that do not use air. One year later, well drillers and DNR regional staff report success.

These wells are already very expensive. With the rising price of steel and greater depth to groundwater, well costs nearly double for both drillers and owners. Wells that had been — $5,000 to $7,000 become $10,000 to $12,000. As a consequence, the specific well construction guidelines for each quarter section mapped allow for a smaller well casing area concentrated along the densely populated U.S. Highway 41 corridor from southwest of Oshkosh to just west of Green Bay. From new well construction records, researchers and regulators review and reevaluate mapping efforts and adjust for accuracy to accommodate aggressive development. They hope to lessen economic burdens by reviewing reports, keeping maps up to date, and funding replacement wells for income-eligible well owners. Private well owners may choose to form community water systems, group wells or neighborhood cluster wells, and developers are urged to provide cluster wells. Local health departments provide educational outreach.

Outreach scholarship includes:

Brown, B.A. 2005. Preliminary Bedrock Geologic Map of Outagamie County, Wisconsin. WGNHS Open-File Report 2005-02.

Brown, B.A., and M.L. Czechanski, 2005. Arsenic Special Casing Area in the Fox Valley: An Example of Data Integration and Interagency Cooperation from Initial Research to Rule Development. Proceedings of WLIA Annual Meeting, Green Bay, p. 8.

Brown, B.A., M.L. Czechanski and D.M. Johnson, 2005. Arsenic Special Casing Area in the Fox Valley: An Example of Data Integration and Interagency Cooperation from Initial Research to Rule Development. Proceedings of Wisconsin Section AWRA Annual Meeting, Delavan, p. 15.

Gotkowitz, M.B., Schreiber, M.S. and J.A.Simo, 2004. Effects of water use on arsenic release to well water in a confined aquifer. *Ground Water*, 42(4): 568-575.

Hooyer, T.S., J.W. Attig and Lee Clayton, 2004. Preliminary Quaternary Geologic Map of the Central Fox River Lowlands, Wisconsin. WGNHS Open-File Report 2004-04.

Root, T., Bahr, J.M. and Gotkowitz, M.B., 2005. Controls on arsenic Concentrations in *Groundwater* near Lake Geneva, Wisconsin. In: P.A.ODay (Editor), *Advances in Arsenic Research*, American Chemical Society Symposium Series 915, pp. 161-174.

Schreiber, M.E., Gotkowitz, M.B., Simo, J.A. and Freiberg, P.G., 2003. Mechanisms of Arsenic Release to Ground Water from Naturally Occurring Sources, Eastern Wisconsin. In: A.H. Welch, and K.G. Stollenwerk (Editors), *Arsenic in Ground Water: Geochemistry and Occurrence*. Kluwer Academic Publishers, Norwell, Massachusetts, pp. 259-280.

Impacts

The basic and applied research, inter-agency and interdisciplinary cooperation and new GIS-based geologic mapping create the context for educational outreach to government officials, regulators, planning commissions, educators, and citizen groups. Mark Putra calls this “UW-Extension at its best, Applied in the best meaning of applied research. DNR could never have done this alone.”

“Land use planning needs to be 3-dimensional, we can’t take just a 2-dimensional view,” adds Bruce Brown. “Geologists have a lot of information to offer about how that third dimension limits what you do on the surface.” Brown, Czechanski and Schoephoester are developing 3-dimensional visualization tools to educate planners and local officials on the need to consider what is below the surface.

As arsenic contamination is detected among increasing numbers of private drinking water wells, local governments working with UW-Extension teams are learning about how land use decisions affect public health, what DNR special well-casing depth area rules mean for new development, and how to work cooperatively across county lines to reduce public health risks from arsenic-contaminated drinking water.

Northeast Wisconsin: Working with the DNR and stakeholder partners, Wisconsin Geological and Natural History Survey (WGNHS) state specialists conducted arsenic research, shallow aquifer and bedrock mapping along the Fox River Valley. WGNHS geologists Bruce Brown and Tom Hooyer partnered with Catherine Neiswender, Winnebago County UW-Extension community resource development educator, to develop an educational tour of geologic resources, field guide explaining mapped features, and discussion questions prompting participants to consider land use actions on vulnerable water resources. The 25 participants on the one-day tour included government officials, public health, planning and zoning departments, educators, consultants and resource managers. Tour participants discussed tools local governments could use to reduce well contamination from arsenic-bearing bedrock.

Neiswender shared the geology field guide and tour summary with local governments, and wrote a memorandum to the County Planning and Health Departments summarizing the research data, and encouraging joint efforts via land use tools and public education. Neiswender coordinated educational programs on DNR special well casing depth area rules for the Wisconsin Towns Association in Winnebago and Outagamie Counties. At these meetings, WGNHS hydrogeologist Madeline Gotkowitz presented her arsenic research findings that explain and prescribe the new well construction requirements.

A program survey was used to evaluate the knowledge participants gained during the geology tour. As a result of these efforts:

- Geology tour participants documented learning about new research and mapping.
- Winnebago County local governments and decision-makers:
    - — are more aware of the connection between land use and new well-casing regulations.
    - — learned of land use planning tools to reduce potential exposure to arsenic in drinking water.
    - — gained knowledge about alternatives to individual private wells.
    - — Incorporated safe drinking water in the draft comprehensive land use plan.

Incorporating groundwater as an issue in the comprehensive land use plan provides evidence that County Departments have raised their awareness of and made a decision to address the issue of safe drinking water. In June 2005, the Winnebago County Planning and Zoning Committee held a formal public hearing on the comprehensive land use plan. The County Planning Department spent the next several months incorporating comments and finalizing the plan, which the committee approved in November 2005. The comprehensive plan will next go to the County Board for a public hearing and vote in 2006.
http://winnebago.uwex.edu/wcplanning

Southwest Wisconsin: Iowa County has completed a 4-year comprehensive planning process, which included establishing a groundwater advisory committee. During the planning process, local planning commissions continually discussed groundwater as a criterion for siting new development, and regularly requested more groundwater data. Traditional lead mining in this area gave Wisconsin its “badger state” nickname, and associated toxic metals including arsenic show up in drinking water. The Iowa County Board of Supervisors turned to UW-Extension for assistance with groundwater research.

In FY 2005, Iowa County began a 2-year research project on groundwater with the Wisconsin Geological and Natural History Survey (WGNHS) to inventory groundwater resources. Groundwater meets all water supply needs in Iowa County. Rural residents and farmers rely on private wells for their water supply. Early in the groundwater research project, citizen participation was identified as critical for a successful educational program. Iowa County community resource development educator Paul Ohlrogge chairs a newly formed Groundwater Advisory Committee with representatives from all 14 towns, whom he recruited with input from the fourteen town board chairs. As committee chair, Ohlrogge designed a series of educational sessions focusing on Iowa County groundwater data.

Groundwater advisory committee members learned about groundwater flow, the groundwater cycle, how geology affects water quality, and why some aquifers are more susceptible to contamination from land use. The committee has been an asset to WGNHS state specialists, locating abandoned wells and identifying landowners who allow WGNHS mapping teams to enter their property and conduct specific research for the project.

Evaluation of the success of multi-state and joint activities

Key Themes: Food Safety, Food Quality, HACCP

Multi-state food industry training

UW-Extension campus faculty integrated within the College of Agricultural & Life Sciences at the University of Wisconsin-Madison work collaboratively with colleagues across the country in meeting the needs of small and very small meat and dairy processors.

Collaborations with the University of Minnesota include:

- Better Process Control School, a U.S. Food and Drug Administration-required course for supervisors working in the nation's canning plants.
- Cider maker training for individuals to meet federal requirements.
- Seafood HACP training for processors (Hazard Analysis Critical Control Point).

The University of Wisconsin continues to work with the North Central Regional Aquaculture Center to distribute educational videos aimed at training seafood processors to meet federal standards.

In addition to the Better Process Control School with Minnesota (above), UW-Extension offers other professional training that attracts industry personnel from across the nation and internationally:

- Brewers' Course
- Master Cheese Maker series of short courses
- Milk pasteurization short courses

UW-Madison / Extension campus faculty participated in training Iowa and Illinois fruit and vegetable growers on safely applying manure to their crops.

Applied research

UW-Madison / Extension applied research strengthens multi-state and statewide food safety education:

- Continued evaluation of consumer food handling practices led to development of improved educational messages for clients.
- Research on the safety of applying non-composted cow manure as fertilizer in vegetable production improved methods for evaluating the hygienic condition of ready-to-eat foods.

- Improved processing of sprouted seeds and alternative processing techniques for apple cider allowed specialists to better address the needs of consumers, state and local governments, and the industry.

A major contribution to the industry was establishment of the University of Wisconsin Center for Meat Process Validation in 2003, addressing small and very small meat and poultry processors' need for applied research to meet federal HACCP guidelines. Faculty affiliated with this center have been successful in attracting federal funds to study problems critical to validation of processes important to small and very small meat and poultry processors.

In 2004, the Center for Meat Process Validation scientifically evaluated a wide range of meat processing techniques for safety. A portion of the center's work is supported by an integrated food safety grant, with the Eastern Regional USDA-ARS lab as an investigative partner.

FY 2005 participation: Steve Ingham 0.10 fte, Scott Rankin 0.10 fte

Goal 2

Evidence: Campus and county-based faculty and staff report their work against desired outcomes through Cooperative Extension's Planning and Results System (PRS). They also submit more detailed success stories of their work for the PRS database. Wisconsin Food Stamp Nutrition Education (FSNE) 2005 annual reports are available at: http://www.uwex.edu/ces/wnep/evaluate/reports/FY05/rpts/FY05ar_stat.pdf

Goal 3: A healthy, well-nourished population

Executive summary

Situation

Wisconsin adults make choices about their own nutrition and lifestyle behaviors in an environment that promotes overeating and facilitates inactivity. Obesity has reached epidemic proportions nationwide, and increased statewide from 13 percent in 1991 to 22 percent in 2001. According to 2000 U.S. Census data, 8.7 percent of Wisconsin adults and 10.8 percent of children live in poverty. In many more households, incomes are considered above the official poverty line, but still low enough to qualify families for government assistance programs such as food stamps and Badgercare health insurance. Low-income women are most at risk of obesity, their children are most at risk of being overweight or of becoming overweight. This in turn puts these families most at risk of diabetes and chronic diseases, costing six times more for medical care than for those without diabetes. Regular physical activity and healthy eating can model positive life-long behaviors, but children still need safe places to play, walk and bike.

Likewise, hunger is disproportionately high among officially poor Wisconsin families — many do not have enough food to meet their needs. Statewide, more than half a million people live in households that are food insecure — they do not always have access to enough food for an active healthy life. Low-income families have alarmingly high rates of food insecurity and hunger — the most severe form of food insecurity.

Extension response

The UW-Extension statewide self-directed Eating Right and Being Active Team and Poverty and Food Insecurity Team include faculty with research and extension appointments, drawing on the expertise of the College of Agricultural and Life Sciences, the School of Human Ecology, and the Center for Biotechnology.

Wisconsin's goals for working toward a healthy, well-nourished population include:

- Communities will promote healthy food, physical activity and lifestyle choices.
- Individuals/families will achieve optimal health throughout their lifespan by choosing and preparing nutritious meals and snacks and balancing the food they eat with physical activity.
- Communities will ensure that all people at all times have physical and economic access to sufficient acceptable food to meet their dietary needs for a productive and healthy life.
- Individuals/families will manage their resources so they are healthy and well nourished.

UW-Extension campus and county educators form close collaborations with colleagues and health professionals to reach shared audiences, work carefully with local advisory committees, and take initiative to reach under-served audiences (see Goal 2 executive summary for more details on these relationships). Audiences for nutrition, physical activity, poverty and food security education include parents and caregivers of young children, limited resource families, culturally and ethnically diverse individuals and families, under-served and under-represented populations, youth and older adults — and those who serve them.

In 2005, the Eating Well and Being Active Team received funding to evaluate the year-long monthly nutrition and physical activity education campaign Families on the Move. Family Living Programs, 4-H Youth Development and community nutrition education partners strengthened relationships and built capacity using these educational materials. Wisconsin Nutrition Education Program (WNEP) community-based nutrition educators and coordinators work with diverse individuals, families and communities affected by economic poverty, tailoring messages to Food Stamp recipients and those eligible for the Food Stamp program (Food Stamp Nutrition Education, FSNE), as well as Expanded Food and Nutrition Education Program EFNEP) families in 59 counties. Easy-to-read nutrition and money management educational materials are culturally reviewed and adapted in English, Spanish and Hmong. WNEP also engages community partners in understanding issues of hunger and obesity through poverty simulations.

Impacts

Promoting healthy nutrition, physical activity and lifestyle behaviors for a healthy, well-nourished population through Family Living Programs, Food Stamp Nutrition Education and 4-H Youth Development, the statewide self-directed Eating Well and Being Active Team and Poverty and Food Insecurity Team report the following FY 2005 impacts of nutrition, physical activity and food security education under National Goal 3 Key Themes.

Total expenditures:

(By FTEs and source of funding — Integrated Research & Extension

	FTEs	**Smith-Lever**	**State match**	FSNEP match
Smith-Lever	8.60	$117,157	$888,771	--
EFNEP/ FSNE	129.47	$1,763,758	$6,395,555	$6,395,555

Key Themes: Human Nutrition; Other: Under-Served Populations

Wisconsin Nutrition Education Program helps low-income individuals and families make healthier food choices

Situation

An average person now eats more than one-third of their food away from home, making choices in an environment that encourages overeating. Compared with food prepared at home, food obtained away from home tends to be higher in fat, saturated fat, sodium and sugar, and lower in calcium and fiber.

Obesity and Type 2 diabetes have reached epidemic proportions. Rates are disproportionately high among low-income Latinas, American Indian and African American women and youth. As need grows for promoting healthier diets and more active lifestyles, UW-Extension Cooperative Extension has the research base, culturally appropriate educational materials, networks and expertise to help Food Stamp-eligible children, youth, families and older adults at risk make healthier food choices.

Extension response and program impacts

The Wisconsin Nutrition Education Program (WNEP) responds to the diverse needs and resources of low-income families by offering nutrition education programs in a variety of community settings using group sessions, learn-while-you-wait, lessons for individuals and other strategies. Bi-lingual nutrition educators help reach underserved families using culturally reviewed and adapted educational materials in English, Spanish and Hmong. WNEP operates as 39 programs in 59 counties with 884 community partner agencies (see the Goal 2 executive summary for details).

Dietary quality education: Whole grains are recommended because they are associated with a lower risk for coronary heart disease and type 2 diabetes. Diets rich in fruits and vegetables are associated with lower risk for stroke, type 2 diabetes, and certain cancers. Gaining knowledge and awareness related to key dietary recommendations is an important step to choosing a healthful diet. In FY 2005, community-based nutrition educators and coordinators made 223,000 teaching contacts on diet quality topics — three-fourths of all WNEP educational contacts. WNEP education took place in a variety of settings:

- 43% of all WNEP teaching was on youth-related diet quality topics in K-12 schools, summer school/feeding programs, Head Start, and community gardens.
- 11% of all teaching was on diet quality topics at senior meal sites/programs.
- 9% of all teaching was on diet quality topics at technical schools, ESL classes, libraries, job training centers, food stamp offices, shelters, emergency food programs/pantries, community action agencies and family resource or neighborhood centers.
- 7% of all teaching was on diet quality topics in public health and WIC clinics.

- 3% of all teaching was on diet quality topics in home-visiting programs, correctional facilities, and group homes.

Program impacts: More than 1,100 low-income individuals and families participated in evaluations before and after one or more lessons on Food Guide Pyramid dietary guidelines, eating plenty of vegetables, reading the Nutrition Facts ingredients panel on packages and identifying whole grains. Results show how learners increased their knowledge:

- 6% of 128 learners could label food groups correctly before the lesson,
  76% of 128 learners could do this correctly after the lessons.
- 68% of 591 learners could use the Nutrition Facts label to choose whole grain bread before the lessons,
  91% of 601 learners could do this after the lesson.
- 41% of 381 learners could use the Nutrition Facts label to choose a lower calorie food before the lessons,
  81% of 390 learners could do this after.

Choosing lower fat foods from a menu: Educators taught lessons on choosing foods with less fat when eating in fast food restaurants to 505 adults, 302 adolescents and 87 older adults. Of these, 267 had children. After lessons simulating choosing foods with less fat from a fast food menu, learners demonstrated that they could modify a fast food menu for lower fat content, then could choose a new menu.

Program impacts: Pre- and post-lesson evaluations showed that as a result of the lessons:

- Adults could reduce the fat content of their choices by an average 27 grams per meal, adolescents could reduce the fat content of their choices by an average 26 grams per meal.
- 76% of adults and 41% of teens indicated at least one change they are willing to make when they eat in fast food restaurants.

Feeding young children: Young children ages 3 to 5 adjust their meal size according to the energy density of the food they eat — they regulate their energy intake. When parents control meal size or encourage children to eat rather than letting them heed their own sense of hunger, children have a harder time regulating their own energy intake. More than 300 low-income adults with children and pregnant teens participated in a lesson on creating a positive feeding environment for toddlers and preschoolers.

Program impacts: Before and after the lesson, participants were asked to identify appropriate parent/and child roles in feeding:

- 51% of 315 parents initially said that their child is responsible for whether to eat at meal or snack time,
  73% of 301 parents said this after the lesson.

- 48% of 313 parents initially said their child is responsible for how much to eat, 87% of 301 parents said this after the lesson.
- 73% of 249 participants initially agreed that parents should not tell children they have to eat everything on their plates, 86% of 231 agreed with this idea after the lesson.

Stepping Up to a Healthy Lifestyle: This physical activity and nutrition education campaign was conducted from March to August 2005 by 210 partners of the Wisconsin Nutrition Education Network organized in 48 teams serving 52 counties and the Great Lakes Intertribal Council. Stepping Up to a Healthy Lifestyle promoted good nutrition and daily physical activity, consistent with the Dietary Guidelines for Americans for Wisconsin FoodShare recipients and applicants including children, youth, families and older adults. The network consists of the UW-Extension Food Stamp Nutrition Education (FSNE), WIC — Women, Infants and Children Program, Elderly Nutrition Program, Maternal and Child Health (MCH), Head Start Collaboration Project, Hunger Task Force of Milwaukee, Madison Area Technical College, and UW-Madison Department of Nutritional Sciences. Network partners reached 14,734 learners in direct teaching contacts through small groups, one-on-one, as part of a series or a one time teaching event. WNEP community partners made 73 percent (10,712) of the direct teaching contacts, and 76 percent (92,783) of the indirect contacts.

Program impacts: Retrospective post- then pre-lesson questions were administered to evaluate each lesson. Overall, for all 9 nutrition and physical activity items, more participants (69%) said they would perform the desired behavior more often after the lesson than did those who said they practiced the desired behavior before the lesson (43%). Partners completing the evaluation reported that the campaign strengthened their partnering relationships even when these relationships were already established.

Key Themes: Human Health, Human Nutrition

Families on the Move builds capacity and strengthens relationships among nutrition and youth educators, community partners and obesity coalitions

Situation

Obesity has reached epidemic proportions nationwide, costing about $117 billion a year in medical care. In Wisconsin, the obesity rate among adults increased from 13 percent in 1991 to 22 percent in 2001, disproportionately higher among low-income Latinas, American Indian and African American women and youth. The Centers for Disease Control and Prevention report that 10 percent of the state's high school students are overweight and 14 percent are at risk of becoming overweight, with an 80 percent chance of becoming obese adults, developing diabetes and other chronic diseases.

Adults make choices about their own behaviors in an environment that promotes overeating and facilitates inactivity. More than 60 percent of U.S. adults do not engage in enough physical activity to provide health benefits. Regular physical activity and healthy eating can model positive life-long behaviors, but children still need safe places to play, walk and bike. The U.S. Surgeon General has called on families, communities, schools, work sites, government and the media to work together on solutions promoting healthy lifestyle choices.

Inputs

The statewide self-directed Eating Well and Being Active Team developed a year-long series of nutrition and physical activity news releases called Families on the Move. Beginning in September 2004, long and short versions of the releases were sent to county educators monthly but not to statewide media. The Families on the Move Work Group included staff from Family Living Programs (FLP), 4-H and Youth Development (4-H), and the Wisconsin Department of Health and Family Services. Amy Rettammel, team co-chair, led the project.

In 2005, the team received funding to evaluate Families on the Move. Surveys were conducted with FLP and 4-H county colleagues and work group members. Twenty-one colleagues responded to an email survey (17 FLP and four 4-H). The work group also engaged the clipping services of the Wisconsin Newspaper Association between March and June 2005. Thirteen articles were clipped by the service or sent in by county educators.

Outputs

Key evaluation findings included: the series was used in 21 counties, most heavily in the Eastern District; and 16 of the 21 counties responding used the releases with local media. The evaluation also indicated that the news releases supported county colleagues in their role as a community resource and in some cases opened doors for further educational opportunities. The releases were adapted to other formats and repackaged into discussion guides for partner organizations.

FLP county educators returned 17 surveys. Educators used the releases with local news media (14); in UW-Extension newsletters (5); in partner newsletters (3); with local obesity coalitions (3); and in a high school newsletter (1). Seven educators used the whole series, seven used half the articles, and three used just one or two. Most educators made small changes to the releases (12), while two made significant changes and three used them as written. Twelve educators preferred the long version and six preferred the short version. A follow-up survey sampled FLP colleagues who did not respond to the initial survey, revealing that a number were unaware of the series. This led the work group to update the releases for 2006 and make them available on the Family Issues and Demographics website: http://www.uwex.edu/ces/flp/demographics/weight/familiesmove.cfm

Impacts

The Families on the Move local focus connects educators with the resources of their county UW-Extension office, increases their public visibility, and lets them customize nutrition and physical activity topics with local information.

Direct submission by a local source person makes news media more likely to ask for interviews or follow-up news articles. A family living educator now writes a regular monthly column in the local newspaper. A number of educators reported that the series had an impact on their work in the community. Releases printed in local papers led to radio interviews, discussions and questions, and new relationships with schools. The series theme identifies the information for readers to find. Obesity coalitions, 4-H and HCE clubs (Home and Community Education) also use these monthly news releases

Family living educators reported that the series had the following advantages:

- Practical, timely, easy to use resource.
- Provided topic ideas for doing other articles.
- Saved research and writing time.
- Good public relations for a new educator.
- Enabled a local childhood obesity coalition to gain visibility in the community.
- Prompted a newspaper to begin a new monthly column.
- Nutrition education community partners also used the releases.

The 4-H youth development educators reported that the series saved them time they could devote to other work, and provided topics for a weekly news column or radio feature. The educators reported that the series increased their exposure, and suggested focusing on a youth audience. One educator commented:

> "I wish more teams would do this — it really helps me convey the research and information to the public better."

Families on the Move Work Group members reported how the series was more efficient than individual efforts:

- County UW-Extension educators appreciated being able to plan each month.
- Each of the 8 work group members only contributed a few times as an author or reviewer, yet benefited from the entire 12-month series.
- Members described their collaboration as:

  "Great use of our professional time, expertise and resources."

  "What's most important is what works for county colleagues—it may be more important to have new relationships and opportunities at the local level that can carry into other UW-Extension work."

  "I felt it was a very good process, with individuals taking responsibility for their role."

  "Having reviewers resulted in better writing; I would like to see more teams take this approach."

Key Themes: Human Health, Human Nutrition
Other: Food Security, Under-Served Populations

Food security and poverty education increase community capacity to lessen hunger among low-income individuals and families

Situation

More than half a million people or 1 in 11 Wisconsin households are food insecure — they do not always have access to enough food for an active, healthy life. Around 1 in 30 households experiences hunger — the most severe form of food insecurity. Hunger and food insecurity are real problems for Wisconsin families. Statewide, about 540,000 people live in households that are food insecure. Low-income families have alarmingly high rates of food insecurity (44 percent) and hunger (19 percent. According to 2000 U.S. Census data, 8.7 percent of Wisconsin adults and 10.8 percent of children live in poverty. In many more households, incomes are above the official poverty line, but still low enough to qualify families for government assistance programs such as food stamps and Badgercare health insurance. About 1 in 5 Wisconsin residents — more than a million people — are either living in poverty or are considered low income.

Several trends indicate that these situations may be worsening for low-income families:

- Statewide unemployment rates increased from 3 percent in 1999 to 5.6 percent in 2003.
- Relative to other states, Wisconsin households have become more food insecure and hungry.
- Emergency food providers, such as food pantries, report that demand is at an all-time high.

People are also seeking more food assistance. For example, participation in the food stamp program — now called FoodShare in Wisconsin) — increased 82 percent between October 1999 and October 2004. This increase ranks among the largest in the nation.

Wisconsin continues to rank at the bottom nationally for School Breakfast program participation. Less than half (47 percent) of Wisconsin schools that offer free or reduced-price lunch programs also offer breakfast programs. Only a quarter (25 percent) of low-income students who receive subsidized school lunch also receive school breakfast.

Extension response and program impacts

The statewide self-directed Poverty and Food Insecurity Team and Wisconsin Nutrition Education Program (WNEP) provide poverty and hunger awareness education programs to help communities better understand the scope of the problems, underlying causes and potential solutions. Working with local agency partners, WNEP research-based education programs reduce barriers to food security and help communities improve food access for low-income individuals and families at risk.

Poverty and hunger awareness education: In FY 2005, WNEP facilitated 13 local poverty awareness programs reaching more than 900 people. These programs raised awareness by helping people better understand the situations faced by low-income families. Program participants said: "For me to go through this, it really made me aware. I just can't imagine getting up in the morning getting out of bed and going through that struggle again." "It helped increase my awareness to the emotional toll that it takes many, many people who seek out these services are embarrassed, frustrated." "For me it was a wonderful eye-opener. A part of life I had no sense of at all."

WNEP created *Hunger Close to Home*, a hunger awareness publication series with local demographic data for each of Wisconsin's 72 counties to help local educators and stakeholder partners share research-based information about the issue in their own community. WNEP community-based educators conducted 15 Hunger Close to Home programs, reaching about 400 people.

Program impacts: Before poverty awareness programs, 27 percent of participants reported "quite a bit" or "almost complete" understanding of the extent of food insecurity and hunger. After the programs, 90 percent reported "quite a bit" or "almost complete" understanding. When asked to name the most important thing they learned about hunger, participants said: "Its closer to home than I thought. The stats were staggering! It's a huge problem! It is a real and serious issue that needs to be addressed. Too many people are hungry."

2005 Collaborative Project Impacts include:

WNEP facilitated or participated in 21 local hunger prevention coalitions serving 25 counties. WNEP staff played key roles in cultivating new coalitions, providing on going consultation and support, systematically documenting coalition activities and successes, and facilitating communication.

- Through community partnerships, WNEP enhanced access to fresh fruits and vegetables through community gardens or farmers markets. For example, the Nutrition Coalition of the Chequamegon Region, created a Mobile Farmers' Market to reach rural Ashland and Bayfield Counties, where no markets exist for senior citizens and WIC participants to use farmers' market vouchers. The Mobile Market made 17 visits to seven sites. 84 percent of seniors and WIC clients surveyed said that they were eating more fresh fruits and vegetables and 97 percent said they would use the market next year. Producers benefited from this new outlet for their crops.

- WNEP worked with community partners to increase donations of emergency food for families with immediate needs. For example, WNEP in Calumet, Outagamie and Winnebago counties collaborated with the Hunger Task Force to bring in 57,000 pounds of food. These donations made an impact on the food security of individuals in poverty in Oshkosh.

- WNEP worked with partners to improve access and increase participation in school meals. For example, Brown County WNEP and program partners started a summer breakfast program, serving over 6,000 meals at three sites in the initial year. Due to its success, the Green Bay School Food Service continued the program, expanded it to include lunch, and now serves over 1,500 children on an average day at 38 sites around the county.

Poverty and food insecurity are closely linked. UW-Extension provides poverty awareness education and training on strategies for working with low-income audiences.

- Throughout Wisconsin, UW-Extension has facilitated more than 75 local poverty awareness programs reaching more than 4,000 people. Program evaluations document striking increases in understanding among participants, and report changes in the way participants interact with low-income clients. Fourteen more programs are planned for 2005.
- UW-Extension also leads educational programs to develop skills for working with families in poverty. 141 people have been trained to conduct education programs to help participants understand the effect of economic class on behaviors and mindsets.
- During the past 3 years, UW-Extension trainers have facilitated more than 135 workshops, reaching more than 3000 staff and volunteers from more than 40 community agencies and organizations. Trainers have reported significant increases in participant knowledge and understanding of issues of generational poverty, as well as identification of skills needed to work more effectively with families in poverty.

Evaluation of the success of multi-state and joint activities

Key Themes: Human Health, Human Nutrition

Dr. Judith Bartfeld, Department of Consumer Sciences, UW-Madison / Extension, collaborates with Dr. Rachel Dunifon, Cornell University, on a project involving use of self-administered surveys to assess food security among households with elementary school children in Wisconsin and New York. The Wisconsin portion of the study has been funded by a Hatch grant as well as a USDA grant administered through the Institute for Research on Poverty.

FY 2005 participation: Judi Bartfeld 0.10 fte

Dr. Susan Nitzke, UW-Madison Department of Nutritional Sciences, continues her leadership for research affiliated with a five-year multi-state Hatch and Extension project on Stages of Change and fruit/vegetable behaviors of young adults. She is the principle investigator for a complementary multi-state IFAFS project that applies Stages of Change and other constructs of the Transtheoretical Model to a set of tailored newsletter-based interventions that is being extensively evaluated to determine the effectiveness of this approach in reaching economically disadvantaged young adults.

For this study, WI maintained a password protected website for the team of investigators to share grant-based information. WI worked with the multi-state research team to assess the effectiveness of an internet-based system for presenting messages from this group's IFAFS-funded successful intervention in a more practical format for widespread use at the community level. WI organized and hosted the NC219 annual meeting in Madison, October 12-14, 2005.

Program impacts Stage-tailored, individualized intervention materials provided to young adults were found to improve consumption of fruit and vegetables. The more extensive intervention with a combination of tailored mailed materials and two educational phone calls over a 6-month period were more effective than the shorter web-based system in terms of fruit and vegetables intakes, but both modes of intervention were found to have advantages in terms of demands on educators and participants. These findings will enable nutrition educators to provide more effective programs to promote nutrition-related lifestyle behaviors. The internet-based program has been submitted to the Food Stamp Connections national web-based system for review and distribution.

Outreach scholarship:

Chang, M.W., Baumann L.C., Nitzke S., Brown R. Predictors of fat intake behavior differ between normal weight and obese WIC mothers. *American Journal of Health Promotion* 2005;19(4):269-277.

Ruud J.S., Betts N.M., Kritsch K., Nitzke S., Lohse B., Boecker L. Acceptability of stage-tailored newsletters about fruits and vegetables by young adults. *Journal of The American Dietetic Association* 2005;105:1774-1778.

FY 2005 participation: Susan Nitzke 0.15 fte IFAFS-funded research, 0.10 fte multi-state Hatch-supported research

Dr. Sherry Tanumihardjo, Department of Nutrition Sciences, finished a multi-state project this year which was funded by the USDA-IFAFS from 2000-2005. This was a research-extension integrated grant and Dr. Phillip Simon, USDA geneticist, was the project director. The research of Tanumihardjo, determined the bioavailability of various carotinoids from specialty carrots of multiple colors using human and animal models. The extension component involved two in-services entitled, “What are functional foods?” and “Nutrient Bioavailability.” These were offered throughout the state in the past few years. This included both PowerPoint presentations and outreach materials. One of these materials, a produce booklet entitled, “How does your garden grow?” resulted in more than 60,000 requests and is now available to all states in the form of a CD.

The newest award is a USDA-NRI research-extension integrated grant from 2004-2008, “Promotion of high vegetable consumption as a weight-loss strategy and general well-being.” Dr. Tanumihardjo is the project director for this grant. The research component continues until 2006 and then a comprehensive extension component will be developed for widespread use.

FY 2005 participation: Sherry Tanumihardjo 0.30 fte

Goal 3

Evidence: Campus and county-based faculty and staff report their work against desired outcomes through Cooperative Extension’s Planning and Results System (PRS). They also submit more detailed success stories of their work for the PRS database. Wisconsin Food Stamp Nutrition Education (FSNE) 2004 annual reports are available at: http://www.uwex.edu/ces/wnep/evaluate/reports/FY05/rpts/FY05ar_stat.pdf

Goal 4: Greater harmony between agriculture and the environment

Executive summary

Situation

Maintaining farm profitability while protecting the natural environment remains a priority concern statewide. Agriculture and real estate development compete for the same land. Farmers and communities must plan for sustainable land use, drinking water supplies and water quality. Clean, clear lakes are a major reason Wisconsin generates more than $8 billion annually from recreation and tourism.

In early 2005, manure runoff was in the news as heavy rains and sudden snowmelt washed unsafe amounts of nitrogen and bacteria from frozen cropland into private wells and popular fishing areas. Nearly 66,000 farmers who handle animal waste and face tightening regulations must design and follow their own nutrient management plans using conservation best practices to control erosion and runoff of non-point source pollution.

Extension response

UW-Extension Agriculture and Natural Resources Extension (ANRE) and Community, Natural Resource and Economic Development (CNRED) campus and county educators work with stakeholder partners such as farmers, farm support businesses, county, tribal, state and federal conservation and regulatory agencies and their citizen advisors to develop research-based programs that meet local needs and help rural neighbors and communities become better stewards of the land and watersheds.

New research based education introduces management tools so farmers can credit manure and legume nitrogen in soils, apply only as much fertilizer as their crops can use, and adjust livestock rations to reduce the amount of excess phosphorus their animals excrete. Team Grains state soil specialists are updating nutrient application rate guidelines given the rising cost of fertilizer against stagnant corn prices.

The Dairy Team Livestock Siting / Land Use Work Group developed a series of workshops in 2005 to help municipal and county officials understand the new Livestock Facility Siting Law and align local land use policies. The Wisconsin Legislature passed this law to encourage constructive dialog among rural neighbors, and UW-Extension campus and county faculty are assessing research-based standards for new and expanding livestock operations to meet and for communities to make livestock siting decisions.

Guided by their UW-Extension advisors, the growing Professional Nutrient Applicators Association of Wisconsin established certification trainings, a code of ethics and standards of conduct, and enforcement procedures. Certification trainings are improving professional practices, reducing environmental risks and liability costs, and have been tested and revised for use in the Great Lakes Regional Water Quality Program.

The statewide self-directed Nutrient Management Team has formed strong local partnerships and secured funding to assess best practices through the Discovery Farms Initiative network of on-farm research, and to expand teaching of best management practices and tools through Nutrient Management Farmer Education Programs. Multi-Agency Land and Water Education Grants (have helped at-risk farmers develop nutrient management plans and funded more than 100 multi-year nutrient management projects, investing around $10 million in areas with the most need and greatest potential to protect water resources and secure farm profitability. (See Goal 1 for Integrated Pest Management research and education.)

Community resource development and basin educators work with Wisconsin trained citizen volunteers, scientists, students and 4-H youth, local, state and federal governments, environmental and other stakeholder partners to reduce stormwater runoff and soil erosion and improve and protect water quality in critical areas of watersheds (see Goal 2 for integrated research and extension education tracking, mapping and regulating arsenic in drinking water).

Impacts

While many UW-Extension statewide ANRE and CNRED self-directed teams address environmental concerns, Team Grains, the Dairy Team Livestock Siting Work Group, the Nutrient Management Team, Custom Applicator Subcommittee and Discovery Farms, the Stormwater Team, Basin Education Program and Wisconsin Buffer Initiative report the following impacts of integrated research and extension education as well as evaluation of the success of multi-state and joint activities under national Goal 4 Key Themes during 2005.

Total expenditures

By FTEs and Source of Funding

FTEs	Smith-Lever Act	State match
67.75 Integrated	$922,952	$7,001,658

Key Theme: Nutrient Management

Reducing nitrogen fertilizer rates for profitable corn production

Situation

UW-Extension soil scientists last updated nitrogen (N) fertilizer recommendations for corn grain in 1990. They analyzed the research data that formed the backbone of those N recommendations based on a price ratio of nitrogen fertilizer to corn that was relevant both at that time and in historical context.

Nitrogen fertilizer prices rose rapidly during 2005 while corn prices remained low. This increased the year's N fertilizer to corn price ratio significantly over the historically typical price ratio of the 1990 recommendations, putting corn profitability at risk.

Inputs

Team Grains state soil specialists Carrie Laboski and Larry Bundy (UW-Madison / Extension) worked with their colleagues in Minnesota, Iowa and Illinois to develop a uniform philosophy on making N fertilizer recommendations for corn. The specialists used this multi-state standard to analyze thousands of field trials back to 1983.

The results of their analysis provided a framework for creating new N fertilizer rate guidelines that adjust for the current N to corn price ratio, soil type, and previous crop. These new recommendations provide producers:

- Flexibility in determining the N fertilizer application rate that fits their farm operation.
- Guidance in determining how much N rates can be reduced yet maintain profitability.

In 2001, Fond du Lac County crops and soils agent Mike Rankin developed the Nitrogen Rate of Return Calculator— a computer spreadsheet for producers to achieve their best N rate at current N fertilizer and corn prices. Rankin revised N return calculations for the 2005 and 2006 growing seasons to reflect the new N recommendations.

Outputs

Rankin released versions 2 and 3 of his nitrogen rate calculator Spreadsheet to help producers and farm support professionals determine economically optimal N rates for corn given the soaring N fertilizer prices. At meetings statewide, corn producers, agribusiness professionals and technical school instructors learned to calculate how the N to corn price ratio changes the economic optimum N fertilizer rate to apply. They took home the message that in many cases, they would decrease N application rates to improve corn profitability.

At November and December meetings, Team Grains campus and county faculty introduced the new application rate guidelines to producers and agribusiness professionals through a hands-on exercise. Participants worked in small groups to determine the economic optimum N rate three ways, based on actual research data:

- The new N rate guidelines.
- Old recommendations from 1990.
- A yield goal approach previously used in other states.

When participants completed the exercise, groups reported their N rate decision and discussed the overall performance of the three methods. More than half of all participants chose to try the new N rate guidelines.

Impacts

Team Grains reports that in 2005:

- 475 producers and farm support professionals learned corn grain yields for economically optimal N application rates.
- 55 farmers and 235 agriculture professionals gained understanding of soil management practices that preserve soil productivity, enhance soil quality, and protect the environment.

Of participants responding to surveys:

- Nearly all indicated the exercise helped them understand the new N rate guidelines.
- More than half said they would reduce N rates to improve profitability.
- Many commented that they felt more comfortable reducing N rates using this approach because it is based on research under current economic conditions.

Reducing N application rates to improve corn grain profitability can also reduce N loss to surface and groundwater, adding a key step toward improving the economic and environmental sustainability of Wisconsin agriculture.

Key Themes: Land Use, Land Management

New Livestock facility siting law encourages constructive dialogue among farm and non-farm neighbors as populations converge

Situation

Suburbs and rural subdivisions are being developed where land has long been exclusive agricultural domain. At the same time, some livestock producers are considering expanding their operations. To encourage constructive dialogue in place of conflict, the Wisconsin legislature passed the Livestock Facility Siting Law. This sets predictable-science-based standards for new and expanding livestock operations to meet. Local communities and zoning boards must make decisions on livestock expansions based on these standards.

Inputs

As soon as Assembly Bill 868 cleared the Senate in 2004, the Dairy Team Livestock Siting / Land Use Work Group — county UW-Extension agriculture agents Greg Blonde (Waupaca) Tom Cadwallader and Scott Gunderson (Manitowoc), and others — began developing an educational program to engage public officials statewide. Stakeholder partners include UW-Extension, the Wisconsin Department of Agriculture, Trade and Consumer Protection; Wisconsin Farm Bureau; Wisconsin Towns Association; Wisconsin County's Association; Wisconsin Federation of Cooperatives; Professional Dairy Producers of Wisconsin, and the Dairy Business Association. UW-Extension ANRE and CNRED campus and county faculty presented a series of six workshops in March and April 2005 to help county and municipal officials understand the new law so they can align local land use policies and plans with its research-based standards.

Outputs

More than 500 elected and appointed officials from 47 counties — town and county supervisors, zoning administrators, planning commissioners, assessors, conservationists and other officials -- learned about the state's new livestock siting law through these workshops. UW-Extension Program Development and Evaluation staff helped the work group measure the program's short- and medium-term impacts

Impacts

Of 306 workshop participants from 47 Wisconsin counties who responded to a survey (63% response rate):

- 80% said what they learned would help them make better decisions when weighing the interests of farmers with those of their non-farm neighbors.
- 71% said they gained understanding of the relationships between local and state government in dealing with siting issues.
- 69% learned to identify resources for managing conflicts about land use and agricultural issues.

- 68% said they would act locally to adopt the livestock facility siting law.

County educators Matt Glewen, Bob Kaiser, Mark Mayer and Randy Thompson reported 181 farmers and elected officials developed or modified local siting plans or land use policy as a result of UW-Extension educational programs.

Engaging public participation in achieving a measurable, agreed-on process that balances economic, environmental and quality of life goals addresses the needs of both farmers and rural communities. The Livestock Siting / Land Use Work Group continues to assess best management practices, develop educational resources, create and evaluate educational activities for UW-Extension colleagues, agricultural producers and their non-farm neighbors, public officials and regulators.

Key Themes: Agricultural Waste Management, Water Quality

Fostering professional practices, ethics and conduct among commercial manure applicators

Situation

Wisconsin farms operate under increasing public and regulatory scrutiny. Many farmers rely on commercial manure applicators to manage the land application of livestock waste — about 40 percent of the state's dairy manure and much of all other manure. This makes these firms major partners in meeting regulatory requirements. While properly handled manure recycles valuable nutrients to soil for crop production, spilled or improperly applied manure can contaminate natural areas, water ways, and drinking water.

Inputs

In 2002, the nascent Professional Nutrient Applicators Association of Wisconsin (PNAAW) turned to their UW-Extension advisors for a certification program to improve professionalism among their members. The self-directed Nutrient Management Team responded with an interagency-industry collaboration combining the interests and skills of personnel from UW-Extension, government agencies and the private sector to train and sustain new businesses.

In 2003, the UW-Extension developers pilot-tested and assessed best practices education and consulted colleagues in Illinois and Michigan. They then added train-the-trainer teaching packets for startup firms in 2004, bolstering similar efforts in Iowa, Michigan, Minnesota and Ohio (see the Goal 4 section "Evaluation of the success of multi-state and joint activities").

In 2005, the Nutrient Management Team Custom Applicator Subcommittee working with PNAAW grew to include CNRED state specialist Kevin Erb, conservation professional development and training coordinator, crops and soils agents Jerry Clark (Chippewa) Ted Bay (Grant), Carla Heiman (Green Lake), and ANRE state specialists Ron Schuler, agricultural engineer (UW-Madison), and Kevan Klingberg, Discovery Farms. Equipment manufacturers and suppliers now invest in PNAAW as associate members and contribute to field day demonstrations.

Outputs

At the 2005 PNAAW annual meeting, county UW-Extension educators Bay, Clark and Heiman taught Level 1 classroom trainings for 10 firms. Of these, seven followed up with their own Level 1 sessions, training 40 employees. Custom applicator training progresses through three certification levels. Firms must meet level 1 requirements in order to gain level 2, and meet level 2 requirements to achieve level 3.

- **Level 1** requires each employee to be trained and tested on state regulations, CAFO standards (Confined Animal Feeding Operation), spill response, cleanup and common sense application techniques. Firms that document compliance receive 10 percent off their vehicle liability premium from participating insurance companies.
- **Level 2** requires crew supervisors and business owners to complete 6 to 8 hours of continuing education every 2 years, and pass exams on specific topics.
- **Level 3** requires business owners to develop and implement an Environmental Management System (EMS) plan. Insurance auditors evaluate each firm's EMS to ensure compliance, then award up to 50 percent off environmental liability premiums and 10 to 40 percent off all other insurance except health and Workers Compensation.

The UW-Extension educators provided the guiding principles for PNAAW to craft their professional code of ethics and standards of conduct, adopted by the full membership at their 2005 annual meeting. An Ethics & Standards Committee formed to develop enforcement procedures. Extension farm law specialist Phillip Harris (UW-Madison) reviewed the PNAAW code of ethics, standards of conduct and enforcement procedures. These were each developed as educational documents to guide custom manure applicators' professional conduct, work practices, and procedures for investigating personal and environmental risks as well as misconduct complaints against applicators.

Impacts

By developing a professional association, adopting certification trainings, ethics and standards of conduct, and seeking enforcement procedures, PNAAW is working to reduce the environmental risks associated with livestock waste management. This in turn improves the public and agency standing of PNAAW member firms and the Wisconsin farmers who hire them.

Acknowledging growing mutual trust, the Wisconsin Department of Natural Resources (DNR) reports increases in:

- numbers of spills custom applicators report.
- efforts applicators make to control and minimize damage from their own spills.
- DNR use of trained applicators to help contain and clean up spills by others not associated with custom application.

This trust extends to PNAAW member firms sharing equipment, ideas, techniques, innovations and even employees during bad weather.

As a result of certification trainings during 2005:

- 31 of the 56 active manure application firms have completed Level 1 Certification.
- 145 employees have been trained and tested on Level 1.
- Trained members serve on statewide committees revising nutrient management guidelines and investigating road weights, using the Minnesota Test Track with various application equipment.
- 14 firms have implemented an EMS plan or are close to having one in place to complete Level 3 certification.
- Certified firms save $5,000 to $8,000 a year on their liability insurance, depending on the firm's size.

Success stories

Grant County: Companies operating in Southwest Wisconsin asked Ted Bay for custom applicator training. In March, Bay trained three company owners and four employees in Level 1 certification. Following a training on developing an Environmental management System (EMS) plan, five firms started the process of developing an EMS to achieve Level 3 certification.

Green Lake County: Due to catastrophic manure runoff in early 2005, crops and soils agent Carla A. Heiman is developing a Manure Spill Response Guide for Green Lake County. Heiman also wrote an article on developing a manure spill response plan to inform people about proper procedures for handling a manure runoff event or spill, published in Wisconsin's *AgriView* newspaper and the Central Wisconsin Agriculture Specialization newsletter.

Manitowoc County: A valve failure on a farmer's manure storage released between 500,000 and 750,000 gallons of manure into a dry streambed. Based on previous experience, the DNR warden requested the assistance of a trained applicator. That applicator helped contain and clean up the spill before the manure could enter the Manitowoc River.

Key Themes: Agricultural Waste Management, Nutrient Management, Soil Quality, Water Quality; Other: Under-Served Population (low-income farmers at risk)

Discovery Farms assess best practices, identify critical needs to focus Nutrient Management Farmer Education

Situation

By mid-2005, Wisconsin's 12-month tally of manure runoff into waterways reached 53 cases. Catastrophic runoff contaminating private wells and popular fishing areas made top news. More than 66,000 dairy, livestock and poultry producers face increasing regulatory pressures to reduce such non-point source pollution — to keep agricultural nutrients such as phosphorus (P) from washing into streams and lakes, organic nitrates and ammonia (N) from seeping into groundwater.

Most farmers are natural stewards of the land, and an array of research-based best management practices can help them reduce nutrient runoff as well as production costs. Over the past 15 years, need has grown substantially for farmers to adopt best practices as part of their complete nutrient management plan. Federal rules and Government farm programs, state animal feeding operation permits (AFO and CAFO), local zoning and livestock facility siting ordinances all require farmers to follow nutrient management plans.

Inputs

The Discovery Farms Program conducts applied research through a statewide network of diverse owner-operated commercial farms, drawing on the expertise of state specialists from UW-Madison, UW-Platteville, UW-River Falls and UW-Stevens Point, as well as the U.S. Geological Survey (USGS) as an independent science-based partner. USGS staff help design the research projects, install monitoring equipment and work with Discovery Farms to collect and analyze water quality data. In addition, a citizen-based conservation resource monitoring initiative involves teams of volunteers working with cooperating Discovery Farms producers.

Since fall 2002, both USGS and Trained Local Samplers (TLS), have helped rural landowners monitor the water quality effects of Discovery Farm practices with these objectives:

- Obtain high quality data to evaluate surface water quality trends on the farms.
- Educate farmers and area citizens about the role of agriculture within ecosystems.
- Bring farmer and community interests together by using study results for education.

Each Discovery Farm is set up with a paired basin study design that allows Discovery Farms to establish baseline data in Wisconsin's varying landscape and climate areas, then evaluate nutrient management strategies and practices aimed at reducing non-point source pollution while protecting farm profitability. For example, a first-year study of seasonal water and nutrient flow took a close look at frozen soil rain and snowmelt when spreading manure. Early data indicate that avoiding common snowmelt periods in winter and early spring can greatly reduce surface and groundwater contamination.

Based on their research findings, Discovery Farms Educators developed farm management resources such as:

- Educational publications in print and on websites.
- Farm Financial Systems Enterprise Analysis, for estimating how farm energy use relates to other factors on a farm such as labor, nutrient use and farm profitability.
- Educational tools for the dairy industry on:
  - reducing soil erosion,
  - protecting streams and lakes from sediment and nutrients,
  - recycling nutrients, and
  - reducing reliance on purchased herbicides and fertilizers.

Partnering with state soil specialists, Discovery Farms educators developed assessment tools for colleagues and farm support professionals:

- Wisconsin Phosphorus Index (PI) ranks fields on their potential to deliver phosphorus to lakes and streams.
- SNAP-Plus nutrient management and soil loss assessment software program compares field data to identify areas of critical need with the most potential for improvement using best management practices.

Outputs

Two key programs — training and grant funding to participate — intertwine to reach both farmers who seek out research-based education as well as those who lack the means to do so and can benefit the most by adopting best practices.

1. Nutrient Management Farmer Education Program (NMFE)

The NMFE curriculum combines classroom instruction, individual consultation, and on-farm field trials to examine effective methods for improving nutrient management practices from both economic and environmental perspectives. The next step engages farmers in small groups and one-on-one to develop their own nutrient management plans based on the USDA Nutrient Management Standard 590.

To create the model for this curriculum, Discovery Farms co-director Dennis Frame and Paul Kivlin, Nutrient and Pest Management (NPM) regional specialist, worked with 25 Trempealeau County farmers. Following pilot testing and further applied research, a working group of the self-directed Nutrient Management Team —Scott Sturgul, Richard Proost, Roger Schmidt (NPM), Larry Bundy and Keith Kelling (UW Soil Science), and Kevan Klingberg (Discovery Farms) — revised this successful model for state-wide application.

The Wisconsin Department of Agriculture Trade and Consumer Protection (DATCP) endorsed the curriculum as the only way to certify farmers to write their own nutrient management plans. A local team delivers the training, instructors drawn from UW-Extension county and NPM educators, county or tribal Land Conservation Departments and U.S. Department of Agriculture Natural Resource Conservation Service Environmental Quality Incentive Program (NRCS EQIP), technical colleges, crop consultants and agronomists.

Each participating farmer receives:

- Twenty hours of instruction including workshops on crop nutrition, soil fertility, nutrient crediting of N and P, and environmental regulations.
- On-farm assistance to evaluate livestock manure practices, soil & water conservation, soil fertility & crop nutrition.
- A session to finalize nutrient management plans.
- Annual on-farm conservationist help adjusting plans to meet changing needs and regulations.
- A modest grant to enable participation if needed, for hiring replacement labor during trainings or a consultant to help write the plan, for example.

2. Multi-Agency Land and Water Education Grants (MALWEG) Program: http://clean-water.uwex.edu/malweg/index.htm

The MALWEG Program encourages integration of educational programming into local Wisconsin conservation efforts, targeting nutrient management education. Trainers use the Nutrient Management Farmer Education Curriculum of UW-Extension research-based soil fertility, crop nutrition, soil testing and nutrient crediting materials. Local projects seek competitive grants to deliver training. Multi-agency program support and funding come from USDA's NRCS EQIP and Farmer Service Agency, (FSA), Wisconsin Department of Natural Resources (DNR), DATCP, Wisconsin Milk Marketing Board (WMMB) and UW-Extension.

From 2000 to 2005, the MALWEG program funded 57 projects in 32 counties, delivering nutrient management training to around 1,400 Wisconsin farmers.

Impacts

The NMFE curriculum includes pre- and post-workshop assessments as well as comprehensive long-term assessment using the Farm Practices Inventory (FPI), which measures changes in practice by participating farmers.

Average farm size is 300 acres. Since 2000, more than 85 percent of farmers trained have developed nutrient management plans, resulting in 1,083 plans covering 324,900 acres. Many projects have had such success with this training delivery mechanism that they re-apply and have been accepted in multiple MALWEG Program granting cycles.

In 2005, as a result of participating in county NMFE programs:

- 215 farmers in 13 Wisconsin counties increased their knowledge of nutrient management practices.
- An estimated 80% of these farmers developed a nutrient management plan for their operation.
- About 57,500 acres of cropland were planned, of which the major agricultural enterprise is dairy.

In West-Central Wisconsin: An original core farm in the Discovery Farms network, the Bragger Family Farm handles a 180-cow dairy herd, 32,000 pullets, 100 dairy steers finished annually and a small cow-calf beef herd. They grow corn, soybeans, alfalfa, and winter wheat on 1,000 acres.

Program impacts: The Braggers work hard to minimize their farm's impact on the environment. They practice no-till cropping methods, plant fields on contour strips, have incorporated grass waterways, and have followed a nutrient management plan (based on N and P) since 1995. "It's really important that we get involved and assess what problems are really out there and not just perceived," says Joe Bragger. "We need to document and study these problems, and finally find solutions that make sense, both environmentally and economically."

A forked stream allows side-by-side monitoring on each fork, to compare water quality and runoff from two systems – one natural and one farmed. Monitoring began in September 2001, assisted by USGS research scientists, DNR and volunteer Trained Local Samplers. The first two years of data collected serve as a baseline for existing runoff and water quality conditions. As best management practices are implemented, researchers can measure the effectiveness of different practices. This will also provide realistic numbers for revising regulations. Water monitoring at the Bragger Farm will continue for 5 to 7 years. Real-time data can be found at http://www.discoveryfarms.org/corefarms/Bragger/index.htm

The information collected from this Discovery Farm and two others — Pagel's Ponderosa and Riechers Beef — have been part of a major educational effort conducted by Discovery Farms staff. During the 5 month period November to March, Discovery Farms staff conducted more than 60 information and education programs for 1,422 farmers, 518 farm support professionals, 338 agency staff, 321 citizens, 228 elected officials and 79 lenders: http://www.discoveryfarms.org/corefarms/index.htm

In North-Central Wisconsin: UW-Extension county agriculture educators Mark Kopecky (Price) and Maria Bendixen (Taylor) plus Steve Oberle (Taylor County Land Conservation Department) taught nutrient management planning to 21 farmers, and all but two finished the training.

Program impacts: Farmers who completed these classes improved their understanding of soil testing, crop nutrient requirements, nutrient crediting, and developing their own nutrient management plans. These 19 farmers will use the plans they developed for the 2006 production year. This effort also strengthened UW-Extension's relationship with the Land Conservation Department, and demonstrated to the farmers how each partner agency plays a complementary role in assisting them.

As a result of completing this training, 15 farmers responding to a survey indicated they would either modify or start the following practices:

- Collecting annual manure samples for analysis (80%).
- Regularly calibrating manure spreaders (73%).
- Checking each crop's nitrogen status during or following the growing season (73%).
- Crediting nitrogen from manure and legumes (67%).
- Applying manure according to crop needs based on their nutrient management plan (67%).
- Maintaining records on manure and fertilizer application (67%).

Polk County: Working closely with Land and Water Resources Department staff, Polk County UW-Extension educator Ryan P. Tichich identified and enrolled 10 new farms on roughly 7,000 acres into the Nutrient Management Farmer Education Program. These producers have soil sampled their fields, calibrated their manure spreaders and attended courses taught by Tichich and UW-Extension state Specialists on managing N and P, crediting N, interpreting soil sample results, reviewing current environmental rules, and assembling a nutrient management plan.

Program impacts: As a result of the program:

- 100% of participating producers indicated that they favor nutrient management planning.
- 67% indicated that changes made to their manure management practices better protect the environment.
- 67% recognized commercial fertilizer cost savings and agronomic benefits.

Further surveys show that participating producers:

- Reduced N rates by an average of 54 pounds per acre, which translates to a savings of $20 per acre.
- Reduced P applications by an average of 11 pounds per acre.
- Developed nutrient management plans that meet all Federal, State and local regulations.

Key Themes: Land Use, Natural Resources Management, Riparian Management, Soil Erosion, Water Quality, Wetlands; Restoration and Protection
Other: Under-Served and Under-Represented Population

Building a foundation for effective community-based stormwater and erosion control education

Situation

Increasing population and development are also increasing stormwater concerns such as non-point source pollution in Wisconsin waterways. New state and federal regulations require that communities address these concerns through local ordinances, stormwater management plans and educational initiatives. In 2003, the U.S. Environmental protection Agency (EPA Phase II rules) and the Wisconsin Department of natural Resources (under NR 216) identified hundreds of communities needing stormwater permits.

Stormwater projects are often assigned to municipal engineers, public works directors, planning department staff, county or tribal conservationists. These employees are not educators by profession, yet they are responsible for the stormwater education and outreach programs that the permit requires. Municipal employees identified “support with information and education programs” as a priority need for complying with state and federal stormwater control regulations.

During 2004, the DNR developed new stormwater and erosion control performance standards and guidelines. Builders, developers, consultants, and engineers need to know how to comply with new ordinances, properly design and install stormwater best management practices, and integrate new stormwater and erosion control techniques into designs.

Extension response and program impacts

The Basin Education Program works with the Wisconsin Department of Natural Resources and USDA’s Natural Resources Conservation Service to provide watershed-based natural resources education. Basin educators collaborate with federal, state, local and private partners to develop land and water resource management plans for each county and tribal government within a river basin.

Basin Water Resources programs are organized into eight priority areas based on the results of statewide needs assessments:

1. Agriculture and rural non-point source pollution
2. Stormwater and erosion control
3. Rivers and streams (riparian)
4. Lakes and shorelands
5. Wetland protection and restorations

6. Coastal resource management

7. Groundwater

8. Volunteer Monitoring

The statewide self-directed Stormwater Team relies on results of needs assessments and audiences identified by the Basin Educator Stormwater and Erosion control team.

Key audiences include citizen advisors to government agencies, and through them, policy makers and legislators. For 3 years, UW-Madison rural sociologist Peter Nowak has coordinated the Wisconsin Buffer Initiative. This civic coalition of farmers, conservation staff, government regulators, researchers and environmental groups convened at DNR's request to develop science-based agricultural buffer standards, to report on the role of buffers in redesigning non-point source pollution control (NR 151), and to recommend efficient and cost-effective strategies for improving water quality statewide.

Buffers are strips of vegetation along rivers and streams that filter out sediment and pollutants from runoff before it reaches the waterway. To show policymakers where buffers are most needed, UW-Madison limnologist Jake Vander Zanden and others completed a statewide matrix of 1,600 hydrological zones for identifying and ranking watersheds most suited for riparian controls — degraded water that will respond positively to buffer improvements, and exceptional water that cannot remain so without buffers. Nowak presented the 100-page Wisconsin Buffer Initiative report and poster ranking priority areas to the DNR Natural Resources Board in December 2005: http://www.drs.wisc.edu/wbi

The UW-Madison / Extension Environmental Resources Center (ERC) supports basin educators with community needs assessment surveys, water outreach best education practices for target audiences, and long-term evaluation strategies through its evaluation unit: http://wateroutreach.uwex.edu

Water Action Volunteers: Evaluating nutrient management, stormwater and erosion control best practices such as those recommended by the Wisconsin Buffer Initiative depends on data collected by trained monitors and samplers through the joint UW-Extension and DNR Water Action Volunteers (WAV): Trained citizens, scientists, students, educators, civic and service groups, 4-H clubs and other Volunteer groups are monitoring stream health, cleaning up rivers, stenciling storm drains and taking other actions to improve water quality statewide. More than 1,250 volunteers have been introduced to stream monitoring and education via trainings. More than 20 trainings taught monitoring methods and background information to 555 students and about 290 adults. Other trainings held in partnership with DNR biologists and UW researchers, included crayfish monitoring as a way to measure stream health.

Program impacts: More than 1,250 trained youth and adult Water Action Volunteers devoted 476 days and collected 2,500 hours of data in 43 Wisconsin counties. As of 2005, NRCS and wetlands restoration specialists are using an invasive species map produced from data collected by trained citizen volunteer monitors.

In the Dane County lakes watershed: “My Fair Lakes“ stormwater education was developed by a partnership of 19 Madison area municipalities, 11 villages and towns, the ‘Love My Lakes’ campaign, UW-Extension and the Rock River Coalition. UW-Extension basin educator Suzanne Wade, Dane County natural resources educator Mindy Habecker and Elaine Andrews, ERC interim director and environmental education specialist, helped guide development of a radio, television and web-based stormwater education campaign. Two seasonal public service announcements — 60 seconds for radio, 30 seconds for television — direct listeners and viewers to myfairlakes.com to learn about stormwater and what to do around their home, car, lawn, community and business to keep runoff and pollution from entering the lakes. Former ERC evaluation specialist Ken Genskow surveyed residents to assess their pre-campaign knowledge, attitudes, behaviors and willingness to change. ERC will survey residents again after 5 years to measure post-campaign changes.

Dane County received a $100,000 Urban Non-point Source Pollution Grant to implement the needs assessment, media campaign, K-12 curriculum and teacher training portions of the joint permit’s Stormwater Information and Education Plan. The grant proposal received the highest score in the state because of its depth and breadth and the evidence of partnerships in the region. The Fox-Wolf area of the state used the Dane County Plan as a prototype for how Northeast Wisconsin municipalities could work together to develop a coordinated educational approach. As Regional Water Quality coordinator, Winnebago County CRD educator Catherine Neiswender worked with extension programs in six states on storm water education using this plan to demonstrate how to develop an effective stormwater information and education plan. The model plan is available at: http://www.danewaters.com/

Program impacts The My Fair Lakes stormwater education media campaign reached 657,500 radio listeners and 584,000 television viewers during the spring 2005 campaign. Numbers for the fall campaign are not yet in, but are expected to be similar. The myfairlakes.com website received twenty million hits.

The Madison Area Municipal Stormwater Partnership (MAMSWaP) education coordinator reports many phone and email requests for stormwater fact sheets and assistance during and following the media campaign. Stormwater education committee members observed neighbors sweeping the gutter and doing other behaviors suggested in the campaign. Dane County received a $65,000 DNR grant and $80,000 matching funds from MAMSWaP member municipalities to continue the stormwater education campaign for another two years.

In the Fox-Wolf Rivers watershed: By January 2005, 21 of the 43 regulated local governments plus 2 non-profit groups had joined the Northeast Wisconsin Stormwater Consortium (NEWSC). This regional collaboration supports member communities in meeting permit requirements, improving regional stormwater and erosion control, saving time and taxpayer dollars.

UW-Extension colleagues Kendra Axness, Chad Cook, Mary Kohrell, Catherine Neiswender and David Muench (retired) have worked with NEWSC partners since 2003 to build organizational capacity. Partners include the Fox-Wolf Watershed Alliance, DNR, representative Cities and Counties, municipal sewerage districts, and consulting firms: http://www.newsc.org

As regional specialist with experience planning stormwater and construction site erosion control education, Axness chairs the NEWSC Information and Education Committee that includes UW-Extension educators Cook and Neiswender plus representatives from Calumet County, Villages of Kimberly and Little Chute, and Towns of Grand Chute and Greenville.

To learn how to bring about behavior change through stormwater education, the committee sponsored a workshop with Doug McKenzie-Mohr, an expert on Community-Based Social Marketing. The 53 workshop participants included local elected officials, municipal staff, consultants, educators, and regulators.

The committee then developed a questionnaire to measure area residents' awareness of stormwater issues and willingness to change behavior. A $15,000 telephone survey was funded with equal contributions from NEWSC, UW-Extension Urban Initiative funds, and a Wisconsin Environmental Education Board grant.

Program impacts: Community-Based Social Marketing workshop participants responding to an end-of-session survey increased their understanding of how to build effective educational programs and plan to use the information they learned. The NEWSC Information and Education Committee will use data from the December 2005 phone survey of area residents to identify target audiences, develop effective stormwater education, and support future program evaluation. Results from Catherine Neiswender's evaluation of the NEWSC collaborative indicate that members are more than satisfied with the organization's current work, outcomes and products.

In the Rock River basin: The EPA and DNR identified 30 communities needing a stormwater permit due to soil erosion and stormwater runoff. Little had been done to address educational needs of families and homeowners.

Rock River basin educator Suzanne Wade worked with colleagues, consultants, the Rock River Coalition and other community partners to develop rain garden education kits, displays, signs, workshops and tours using rain gardens to teach about storm water issues and actions people can take to improve water quality. Rain gardens filter sediment and pollutants from stormwater runoff, capturing common contaminants such as excess nitrogen and phosphorous. Rain gardens consist of a top soil layer for growing plants and a deeper sand and gravel layer. When it rains, water pools in the plant zone, then percolates into the sand and gravel which stores the water until it seeps into the subsoil.

In 2005, Wade initiated the "Rain Garden in Every Community" program, securing $24,000 in grant funding plus $19,000 in donations and in-kind services for rain garden installations.

This program is a partnership of teachers and students in grades 5 to 9, the Rock River Coalition, UW-Extension, community groups, consultants, city parks and public works departments. Wade worked with UW-Extension natural resources educator Mindy Habecker and UW Arboretum education staff to develop the stormwater curriculum for this program and shared the results with Master Gardeners, Wisconsin Groundwater Guardians and educators through workshops. Middle-school students complete the lessons, design and install a rain garden, then host an educational event for the community.

Program impacts: Each of the nine rain gardens installed during the past two years resulted in new stormwater education partners for UW-Extension and the Rock River Coalition (RRC), including municipal departments, schools, community groups and consulting firms. Based on research by DNR stormwater specialist Roger Bannerman, these nine rain gardens filter more than 378,400 gallons of water a year.

During 2005, through the "Rain Garden in Every Community" program:

- 24 African American youth from the Boys and Girls Clubs of Dane County installed a 175 square foot rain garden then hosted a community stormwater education event with more than 100 participants.
- 12 Stoughton High School students and 8 adults planted a 1,785 square foot rain garden through a partnership with the City of Stoughton, Vierbicher and Associates, Earth and Water Works LLC, Stoughton High School and RRC.

As of December 2005:

- 18 participants in the rain garden curriculum workshop report completing 11 rain gardens with 6 more planned.
- 7 participants each hosted their own community stormwater education event.
- 14 encouraged others to install a rain garden, resulting in 2 rain gardens completed.
- Several consultants now work with clients to install rain gardens as part of standard storm water control when planning new developments.

The Rain Garden Kit received the 2005 Quality of Communication Award from the Wisconsin Extension Environment and Community Development Association. Rock River basin educator Suzanne Wade worked with Milwaukee Basin Educator Jenny Erickson and DNR educator Kristi Minahan to develop this kit, which includes digital presentations, workshop curricula and agendas, workshop flyers, case studies, websites, resources and photos. Rain Garden Education Kits have been distributed to: 96 university faculty and staff, 27 DNR staff, 25 Land and Water Conservation or Planning Departments, 14 cities, towns or federal offices, 28 non-profit organizations, 12 schools, and 23 private businesses. Another 23 kits have been sent out of state.

The Rock River Coalition received the DNR 2005 Citizen-based Monitoring Group of the Year Award for their combined wetland and stream monitoring programs. Coordinated by Bryan Huberty and supervised by Suzanne Wade, 150 citizen scientists and other trained volunteers gather aquatic and terrestrial data to gain insights into the effectiveness of different restoration techniques on water quality and ecological diversity, determine best protocols for monitoring using citizen scientists, refine established protocols for use with volunteers and provide the state with a case study on how to recruit, maintain and train citizens as wetland monitors: http://basineducation.uwex.edu/rockriver/

In Southeast Wisconsin: A retired professional landscaper and instructor contacted Basin Educator Andy Yencha for help preparing a how-to manual on techniques and benefits of planting vegetative buffers around stormwater basins, for landscapers, homeowner associations, and municipal leaders.

Program impacts: In 2005, 5,000 copies of the resulting UW-Extension Publication GWQ045 Storm Water Basins: Using natural landscaping for water quality and esthetics have been distributed to landscaping professionals, natural resource educators, municipal officials and interested citizens. Stakeholder partners promoting this guidebook include the Wisconsin Landscape Contractors Association and Wisconsin Chapters of the Wild Ones Association. Professional landscapers report they are using this guide as a visioning tool to convince developers that extra dollars to landscape a stormwater pond are justified when balanced by aesthetic enhancements and reduced long term maintenance such as less grass to mow, fertilize and chemically manage: http://clean-water.uwex.edu/pubs/index.html

Evaluation of the success of multi-state and joint activities

Key Themes: Agricultural Waste Management, Water Quality

Custom manure applicator training curriculum revised for regional use

Kevin Erb, University of Wisconsin-Madison / Extension Environmental Resources Center, Charles Gould, Michigan State University Extension, and Randy Fonner, University of Illinois Extension, are collaborating to pilot test, evaluate and improve an interagency effort to augment professional practices among the growing custom manure application industry as part of the ongoing Great Lakes Regional Water Quality Program.

Training custom manure haulers is a flagship project of the Regional Water Quality Leadership Team — a network of Land Grant Universities and Colleges in the Great Lakes States. Extension liaisons coordinate Great Lakes water quality management building on the strengths of extension research, education and outreach at the University of Illinois, Purdue University (Indiana), Michigan State University, University of Minnesota, The Ohio State University and the University of Wisconsin. In 2004, a U.S. Environmental Protection Agency (EPA) Region 5 liaison joined the team.

Pilot trainings were developed in cooperation with professional manure applicators to introduce environmental regulations, lessen odor, prevent manure spills into waterways and minimize environmental damage when spills do occur; then advance training for crew supervisors; and ultimately, for business owners to develop and implement Environmental Management System (EMS) plans.

In 2004, UW-Extension county crops and soils agents Jerry Clark and Ted Bay, plus Kevin Erb as conservation professional development and training coordinator, assessed first-year training and consulted with their colleagues in Michigan and Illinois. They then adapted the certification curriculum to address the need for train-the-trainer education for startup manure applicator firms to prepare crews and “hit the ground running.”

The Wisconsin train-the-trainer model is being adapted for Michigan and Illinois, to pilot-test jointly with 37 custom applicator firms under a U.S. Department of Agriculture CSREES 406 Water Quality grant. Ohio brought together an interagency/industry team to develop their own program based on Wisconsin’s.

Following the 2005 growing season, training evaluations and custom applicator feedback were used to revise the curriculum for interested Great Lakes states and others with regulatory requirements.

Multi-state impacts: Since Wisconsin and Michigan custom applicator trainings began in 2003:

- More than 400 applicators and farmers from 7 states attended 3 demonstrations of containing and cleaning up manure "spills" using actual manure.
- More than 60 applicators participated in classroom training on state specific environmental regulations, odor mitigation or equipment calibration.
- Firms that completed the most advanced training (Level 3) submitted 80 percent fewer insurance claims and less than half as many Workers' Compensation claims than before the training.

Several insurance companies provide economic incentives — 10 to 50 percent discounts on vehicle and liability insurance premiums for applicators that successfully complete trainings.

During the first year, participating applicators:

- Cut their liability insurance premiums an average $3,800.
- Minimized premium increases by reducing insurance claims.

After the first Michigan classroom training, a commercial manure hauler told project coordinators:

> "We had our local DEQ [Department of Environmental Quality] staff at the meeting and that was an advantage. [We had an opportunity] to get acquainted should there be problems, now we know who we have to deal with."

This regional partnership increases coordination among Land and Sea Grant institutions and tribal colleges. Working on shared water quality priorities also broadens outreach efforts of state regulatory agencies, the EPA and National Resources Conservation Service (NRCS).

FY 2005 participation: Kevin A. Erb 0.30 fte, Ted Bay 0.10 fte, Jerry Clark 0.10 fte, Carla Heiman 0.10 fte, Phil Harris 0.05 fte, Kevan Klingberg 0.25 fte, Ron Schuler 0.25 fte

Key Themes: Land Use, Land Management, Water Quality

Training prepares regional agency staff for inspecting livestock operations with more than 300 animals

Situation

As the result of a number of environmental lawsuits and associated rule changes, the U.S. Environmental Protection Agency (EPA) has begun requiring states to issues NPDES permits to all livestock operations over 1,000 animal units (CAFOs), and to those livestock operations with between 300 and 999 animal units (AFOs) with direct or man-made discharge to surface

waters. In Wisconsin and several other Midwestern states, responsibility for issuing these permits lies with the state regulatory agency (DNR in Wisconsin). Discussions with Wisconsin DNR staff indicated that they were unsure how other states were handling the required inspections of both CAFOs and AFOs.

Response

Using funding from the Great Lakes Regional Water Quality Leadership Team, UW-Extension pulled together representatives from regulatory agencies in 4 states — Iowa, Minnesota, Ohio and Wisconsin — for a one day meeting and inspection training at the UW Platteville Pioneer Farm in early October. Regulatory staff from these 4 states and staff from EPA Region 5 toured the beef, swine and dairy facility, then spent the afternoon discussing how inspections are done in each state and how different situations are handled.

Multi-state impacts

As a result of this training:

- Wisconsin DNR staff gained a greater understanding of what EPA is looking for, and are better prepared for the anticipated EPA farm inspections in 2006.

  Minnesota PCA (Pollution Control Agency) staff will change how they do inspections based on workshop discussions.

- Wisconsin, Minnesota and Iowa staff plan to adapt materials provided by Ohio.

A similar training on catastrophic manure spills is planned for January 2006.

FY 2005 participation: Kevin A. Erb 0.60 fte, Kevan Klingberg 0.10 fte, Scott Sturgul 0.10 fte, Rebecca Power 0.05 fte, Richard Proost 0.05 fte

Goal 4

Evidence: Campus and county-based faculty and staff report their work against desired outcomes through Cooperative Extension's Planning and Results System (PRS). They also submit more detailed success stories of their work for the PRS database. Insurance companies providing incentive discounts on vehicle and environmental liability premiums audit all certified custom manure applicators annually to ensure compliance. Multi-state research and extension impacts are reported on the Great Lakes Regional Water Quality Program web site: http://www.uwex.edu/ces/regionalwaterquality/index.htm

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

Executive summary

Situation

Adult leaders and decision-makers continue to recognize that young people are valuable community resources and potential leaders, not simply consumers or recipients of services. Many community-based organization boards are beginning to involve youth as partners in planning, decision-making and ongoing work.

While adults may desire this kind of youth participation, they typically lack the knowledge or experience in how to effectively engage youth in community contribution. Young people also require additional skills and experiences that enable them to participate effectively in community decision-making. Government and community-based organizations need models and assistance in creating youth roles that have the requisite policy and practice support for sustainability.

Response

UW-Extension Cooperative Extension self-directed teams continue to focus educational programs on expanding youth roles as community leaders and active citizens, understanding agricultural issues and improving multi-cultural awareness. Wisconsin 4-H Youth Development programs —offering projects and mentoring from after-school to veterinary medicine — are grounded in research and engage community partners in preparing youth to achieve their full potential as successful adults. Four essential elements of positive youth development frame 4-H programs:

1. **Belonging:** Know they are cared for by others, feel connected with a larger community, contribute effectively to decision-making

   Building relationships, conflict resolution, diversity, global education, international exchange, youth-adult partnerships

2. **Mastery**: Feel and believe they are capable, develop self-confidence, experience success, act responsibly

   Financial education, team building, teen courts, youth in governance

3. **Independence:** Able to influence people through decision-making and action, master skills to make positive life choices

   Goal setting, healthy lifestyle, organization, time management

4. **Generosity**: Feel their lives have meaning and purpose, feel compassion for others, positively influence their communities and beyond

   Character education, citizenship, diversity, community service, environmental stewardship, mentoring, service learning, volunteerism

Wisconsin 4-H Youth Development programs give 251,000 Wisconsin young people opportunities to learn skills, gain self-confidence and contribute to their communities. Backed by the knowledge and research base of the University of Wisconsin, 4-H Youth Development educators design experiential, leadership and citizenship programs delivered directly through 20,000 adult volunteers in 2,100 neighborhood 4-H clubs or groups and in collaboration with 120 community partnerships of 3 or more groups that focus on youth development. County UW-Extension 4-H youth development agents fill a number of roles in these partnerships, including organizer, educator, facilitator and evaluator. These community partnerships expand opportunities to address a wider range of youth needs.

Each year, four district animal science days prepare 4-H youth for judging animal breeds at county fairs, for presenting their oral reasons — and for considering a career in animal husbandry. In 2005, a 4-H evaluation team found that high school students who had been enrolled in the 24 animal science programs for at least 3 years develop better ethical, character, communication, decision-making, relationships and goal-setting skills than their non-4-H peers who had cared for animals for the same duration. Through community clubs and groups and the new 4-H Afterschool programs, 4-H extends its positive youth development reach all across Wisconsin.

The Youth in Governance initiative is a statewide research-based educational program to involve youth in civic life and to encourage adults to share power and decision-making with youth. This includes providing youth with training and experiences with democratic practices, engaging youth in community decision-making and community governance, working with elected officials to establish youth positions on public boards and councils, sitting on juries hearing juvenile misdemeanor cases, and training adults on effectively working with youth as partners.

4-H provides opportunities for youth to learn through their own experiences and accomplishments, practice problem solving and decision-making skills in real world settings, take leadership in their peer groups, and participate in community and civic work as full partners with adults. Research shows that young people who get involved in civic affairs and volunteerism stay involved as adults, and 4-H youth development prepares and places youth in these civic roles.

Impacts

Four statewide self-directed teams — Helping Youth Understand Agricultural Issues, Youth Voices in Community Action & Governance, Strengthening Community Environments for Positive Youth Development and Developing Multi-Cultural Understanding — report the following impacts of integrated research and extension education under national Goal 5 key themes during 2005, as well as progress gathering multi-state data for the national Youth in Governance Initiative.

Total expenditures

By Source of Funding and FTEs

FTEs	Smith-Lever Act	State match
5.80 Integrated	$79,013	$599,404

Key Themes: 4-H Youth Development, Character/Ethics Education, Communication Skills, Leadership Training and Development

4-H animal science project participants develop better character, ethics and life skills through animal science programs than do their non-participating peers

Situation

The Animal Science program is the largest Wisconsin 4-H program with the most participants and the greatest investment. UW-Extension 4-H Youth Development offers 24 projects in animal science, with research-based educational materials written for different ages and reading levels. Each year, four district animal science days prepare participants for judging animal breeds at county fairs and presenting their oral reasons. In 2004, a 4-H evaluation team set out to answer the question: “What is the value of Wisconsin animal science projects?”

Inputs

In 2004, 13,000 Wisconsin youth participated in 4-H animal science projects. On average, each youth enrolled in three animal projects covering production and companion animals and their care: beef, dairy, horse, horseless horse, swine, sheep, goats, poultry, llama, dogs, cats, rabbits, emus, birds, tropical fish, and veterinary science. Most included project literature that is divided into 3 skill levels — beginner, intermediate and advanced — with the purpose to build knowledge and provide opportunities for developing life skills. Curricula are designed to be age appropriate, and to build and enhance skills over multiple years of participation.

An evaluation team — 4-H state specialists Alissa Grenawalt, Ted Halbach, Melanie Miller, Amy Mitchell, Bernie O’Rourke, Tom Schmitz, and evaluation specialist Ellen Taylor-Powell — set out to find how these programs change participants’ lives.

Based on the literature, discussions with program staff and their own experience, the team identified those outcome variables that they thought were the most important and common across all animal science projects. These clustered into four categories that parallel youth development outcomes described in the research literature:

1. **Life skills development:** Changes in knowledge, skills and behaviors in leadership, decision-making, goal setting, organization, relationships, communications.

2. **Cognitive development:** Changes in knowledge in technical subject matter, understanding agricultural issues, being an informed consumer.

3. **Moral development:** Changes in ethical knowledge and behavior.

4. **Career exploration:** Interest in animal industry.

Achievement in these outcomes is linked in the research to life-long success as adults in terms of economic self-sufficiency, healthy families and social relationships, and civic responsibility. The evaluation team drew a stratified sample of 384 rural and urban 4-H youth enrolled for at least the past 3 years and representing all animal science projects from those with the lowest participation to the highest, from llamas and alpacas to beef and horses. For comparison, they also drew a sample of 100 non-participating youth of similar demographics who had also cared for animals for 3 years.

Outputs

A quasi-experimental design combining comparison group retrospective post- then pre- self-assessment with observations at 11 project sites was approved by the UW-Extension Human Subjects Review Board. On all items, 4-H members self-reported much greater positive changes over the 3 year time frame with improved knowledge and behaviors. In every measurement of behavior, the differences between the 4-H members and the comparison group at the post-test period were statistically significant with the 4-H members reporting higher levels of positive behavior.

Outreach scholarship:

The evaluation team reported their findings on the Cooperative Extension Program Development and Evaluation web site.

Summary Report: 4-H Animal Science Program Evaluation, Spring 2004. What is the value of the Wisconsin 4-H Animal Science Projects?
http://www.uwex.edu/ces/pdande/evaluation/pdf/animalscience.pdf

Impacts

Evaluation results show strong, positive character development, moral and ethical values among 4-H participants. Middle and high school youth who take care of an animal as part of a 4-H youth development animal science project gain skills and behaviors that will benefit them for a lifetime — skills in leadership, making decisions, setting and achieving goals, organizing their work, developing relationships, accepting responsibility and communicating.

Character development: Findings show a strong positive relationship between involvement in animal care as practiced by 4-H members in animal science projects and their character development (high correlation and highly significant pre-post change).

Animal care items included: make decisions about my animal based on what is best for the animal, take daily care of animals, train animals regularly, do what is needed to control diseases/pests and keep records on animal.

Accepting responsibility: 4-Hers reported significant improvements on every item over the 3-year period. The greatest change was reported for the item, “Adults trust me with making decisions about my animals”. Comparison youth indicated improvements as well but much slighter. The most positive change was reported for “making decisions about my animal based on what is best for the animal.”

Decision-making in daily life: 4-H members self-reported improvements on survey items measuring change in this skill, with high statistical significance over the 3-year period. Participants reported the greatest degree of change for two decision-making items: Taking responsibility for a decision and getting as much information as possible before making a decision. The comparison group did not report the same levels of improvement: One item showed a slight decline – completing school work on time.

Ethical behavior: Both 4-H and non-4-H groups reported positive improvement on “I make ethical decisions just because they are the right thing to do”. 4-Hers’ level of improvement was greater — from 3.5 to 4.2 on a 5-point scale—while the comparison group improved from 3.3 to 3.5. Responding to the statement
“I know the difference between ethical and unethical behavior”:

93% of 4-H members said they know the difference;
77% of the youth not in 4-H said they know the difference.

Goal-setting: Eighty-eight percent of the 4-Hers reported that they regularly set goals for themselves compared to 70% of the non-4-Hers. Over the 3 years, 4-Hers reported significant improvement in achieving goals that they set—from 3.1 to 3.8 on a 5 point scale — while the non-4-H group reported improving from 3.0 to 3.1 on the 5 point scale.

Developing relationships: Based on these self-reports, the correlation between caring for animals and abilities in human relationships was found to be strong. The 4-Hers reported significant improvements over the 3 years, with average changes of 0.6% and 0.7%. The comparison group reported modest positive changes averaging 0.1% to 0.2%.

Communication skills: Findings suggest a moderately strong relationship between communicating about animals, a skill developed and practiced in the animal science program, and other communications youth employ in their everyday lives. The 4-H participants reported statistically significant improvements over the 3-year period. The comparison group reported no change or modest improvements. On average, 4-Hers reported the most improvement in feeling confident while helping younger or less experienced people with their animals.

Leadership: Findings suggest a moderate relationship between specific skills developed and practiced in the animal science program, and the practice of leadership in everyday life. The 4-H participants reported statistically significant improvements in conveying information, giving oral reasons for decisions and serving in leadership positions over the 3 year period, while the comparison group declined in these areas over the 3 years. If this suggested correlation between specific skills developed in the animal science program and the practice of leadership in everyday life is sound, participating in the 4-H animal science program clearly results in valuable leadership skills.

Animal husbandry knowledge: Most (92% or more) of the 4-H participants reported that they now have technical knowledge of animal care, ideal traits, and the industry. For the comparison group, 70 percent or less of non-4-H youth reported having the technical knowledge. These data indicate that 4-Hers perceive their level of knowledge related to "animal know-how" as much greater than the comparison youth.

Career exploration: The 4-Hers studied have sound animal know-how, and feel well-prepared to consider a career in animal husbandry or industry. Among 4-H participants, 66 percent are considering a career with companion animals, up from 54 percent 3 years ago, and 47 percent are considering a career in the livestock industry, up from 39 percent 3 years ago. For the comparison group, the percent of those considering these career choices declined in both cases: from 38 percent considering a career with companion animals 3 years ago to 26 percent now; and from 22 percent considering a career in the livestock industry 3 years ago to 9 percent now.

Key Themes: Leadership Development, Youth Development / 4-H

Youth advising government officials and other public decision-makers communicate more effectively with adults, share valuable insights

Situation

Youth who get involved in their communities make significant contributions to the quality of life and are more likely to be active, productive citizens as adults. When adults and young people cooperate on civic work, youth develop citizenship skills and both youth and adults gain an appreciation for the contributions of youth.

About two-thirds of Wisconsin juveniles who get in trouble with the law are likely to become repeat offenders — back in juvenile court again before they become adults. Studies have shown the powerful benefits both to youth and their communities when young people play meaningful civic roles. Nationwide, more than 1,000 Teen Courts offer school-age youth seats on their juries.

Even so, administrative rules, meeting times, and adult misconceptions of youth contributions can be barriers to participation.

Inputs

The UW-Extension Youth Voices in Community Action and Governance Team and Strengthening Community Environment for Positive Youth Development Team provide research-based training, educational resources and experiences with participatory democracy and juvenile justice, engaging youth in community decision-making and community governance, working with elected officials to establish youth positions on public boards, councils, and teen courts, and training adults on effectively working with youth as partners. UW-Extension 4-H Leader Boards are also an important venue for youth-adult partnerships, setting direction for 4-H education such as the new after-school programs. Some Wisconsin counties have a long tradition of youth serving on 4-H Leader Boards and others are taking the first steps.

In 2004, 4-H state specialist Matt Calvert led an initiative to address the needs stakeholders identified, creating a multi-agency youth-adult partnership to build capacity among state-wide youth-serving organizations and promote youth in governance.

Youth as Partners in Civic Leadership (YPCL), which includes several statewide youth organizations, organized a 3-day conference in November 2005 at the Green Lake Conference Center. One hundred seventeen youth and 56 adults participated in community youth-adult teams. Participants attended workshops led by youth and adults, including state legislators and city administrators. Youth-adult teams created 24 community plans and 21 teams plan to participate in future YPCL planning and activities.

UW-Extension plays a major role in developing new Teen Courts and training youth jurors. Led by Vilas County 4-H youth development agent Nancy Anne Livingston, county 4-H Youth Development agents and state specialists have helped create 17 Teen Courts now at work in 41 Wisconsin counties. They also provide educational programs and materials in dozens of other communities, and more Teen Courts form every year.

Trained middle and high school jurors hear cases of other juveniles cited for first time misdemeanors such as shoplifting, truancy or vandalism. Where traditional juvenile courts might simply impose a small fine, Teen Courts are empowered to “sentence” offenders to:

- Perform community service.
- Attend classes relevant to their offenses.
- Write letters of apology to those they have wronged.

Outputs

Campus and county 4-H youth development educators provide training, resources and support to youth and adult members. More than 14,500 4-H adult and youth volunteers work with more than 33,000 4-H members. In the counties with Teen Courts where teen jurors hear cases and have the authority to determine penalties for first-time juvenile offenders.

Those “sentenced” performed community service valued at an average of $4,500 per county. While about two-thirds of teens who appear in traditional juvenile courts reappear for later offenses, only 13 percent of young people who appear in Teen Court become repeat offenders.

Impacts

UW-Extension trained and supported youth and adults to overcome the barriers to effective partnership, achieving the youth voice and representation goal of advising and partnering with government officials and other public decision-makers. New and expanded youth in governance, community improvement, civic development and positive youth development activities during 2005 resulted in the following county impacts under these four areas.

1. **Youth in governance:** As youth become stakeholders and change agents in communities, government and organizations, they bring perspectives, knowledge and relationships that lead to better decisions and more productive action.

Burnett County: UW-Extension facilitated a county board strategic planning process coordinated with three civics teachers in the schools, surveying 160 youth and ultimately becoming the largest single group to provide feedback to the strategic plan committee.

Columbia County: Teen Court trainings held in 2005 increased the potential jury pool by an additional 27 teens. At the end of 2005, the Portage Police Department was granted approval to directly refer cases. Trained teen jurors heard 18 cases during the year.

Green Lake County: Markesan students presented to the Mayor, City Council and Public Works Committee their proposal advocating greater youth voice. The Public Works Committee approved a motion to have a youth voting member on the Markesan Events Committee.

Lincoln County: A new Teen Court heard 15 youth offenders’ cases in 9 sessions. Sixteen youth and 13 adults serve on the steering committee and have learned valuable skills about working together to accomplish a common goal. Within the community, this steering committee has opened the door to including youth in community action.

A youth-adult partnership has existed on the Lincoln County 4-H Board of Directors since the 1991-92 4-H year. At the November 2005 annual meeting, six youth were elected to the board, moving closer to having an equal number of youth and adults.

Marinette County: The Teen Court has completed 4 years and heard 114 cases. In 2005, 26 teens served as panelists (judge and jury), spokesperson, advocate and scribe (recorder) with two adult volunteers as advisors. Because being a panelist has been such a positive experience, teen jurors have “sentenced” some offenders to do part of their community service as a teen court panelist.

Ozaukee County: Port Washington Saukville United for Youth is a youth-adult group working on improving relations with local law enforcement, and providing input to youth members serving on the parks and recreation board, business improvement district and chamber of commerce.

Pepin County: In January 2005, the Pepin County Board of Supervisors added youth positions to a board committee.

Portage County: Five youth and twenty-four adults are members of the county fair Exhibit Committee. When a decision needs to be made at fairs, a minimum of three committee members can be called together to resolve a conflict that requires immediate attention. A youth member has taken part in most on-site decisions.

Rusk County: The Rusk County 4-H Small Animal Committee invited youth to the table for input on the small animal program. At the end of the year, the committee voted to include youth as voting members.

Sheboygan County: The 4-H Youth Association proposed including voting youth on the Executive Board. The board changed its bylaws to add two youth representatives, who served successfully during 2005.

Taylor County: Three youth were recruited as full voting members on the Taylor County Fair Board. Those three youth also took their place at the fair to help with many fair board jobs and responsibilities. Four youth took their place as voting members on the Taylor County Federation of 4-H Executive Board of Directors.

Vilas County: Teen Court involved 103 youth in 2005. Four trained High School youth serve on the jury panel each month and 24 participate in monthly trainings.

Washburn County: Three youth representatives attend monthly county board meetings and participate in discussions with adult supervisors. While youth can voice a vote, their votes are not counted.

Waupaca County: Youth on Boards contribute to decisions in many sectors: executive (appointed to 7 city council committees), county cross sectional coalitions (Tobacco-Free, nutrition and activity coalitions), school (community service committee), 4-H (leaders board), non-profit (trails, triathlon, park foundation, community foundation).

- City council committees each have a place for youth voices on their agenda. In 2005, youth committee members:

  — Expanded space, equipment and programs at the recreation center for youth, a $3.5 million project.

  — Expanded space and equipment worth $25,000 in the public library.

- Waupaca County 4-H Leaders' Board currently includes two youth representatives. A bylaw change was approved in January to include all youth in grades 7 and above as voting members of the larger Leaders' Association, which could be about 150 members.

Teen Court was re-established in late 2005 after a 2-year hiatus. The police liaison officer and Waupaca County 4-H youth development educator trained 25 youth jurors. The officer held court sessions the last 3 months of 2005.

Superior Days: In 2005, forty-three youth delegation members helped identify unmet Northern Wisconsin needs to convey to the Legislature in South-Central Wisconsin. The 4-H youth lobbied legislators alongside adults and presented two of the legislative issues.

2. Community Improvement: As youth become stakeholders and change agents in communities and organizations, they bring perspectives, knowledge and relationships that lead to better decisions and more productive action.

Ashland and Bayfield counties: Bayfield County Teen Court members educated Northern District county boards and followed up with a demonstration advocating for program expansion in Ashland County. Their testimony influenced Ashland County's decision to increase 4-H funding to provide for a Teen Court program.

Calumet County: Four youth who attended Winter Leadership Camp transformed the county's 30-year-old 4-H Dance. Adults had balked at moving to a location without alcohol, afraid that they would lose money at their silent auction held during the dance. The youth found a location where the bar is separate from the dance floor. The result was a safe, fun event, free from alcohol and smoke. The Leaders Council made nearly $400 more from their silent auction than in the previous year. The Calumet County 4-H Leaders Council moved to have the youth leaders continue to take charge of the 4-H Dance.

Clark County: Twenty-six community members from 4-H, FFA, FBLA, the National Farm Medicine Center and public schools planned and implemented a Youth Tent at Farm Technology Days that involved over 300 youth and adult volunteers and received 5,000 visitors.

Florence County: Students engaged in the debate over school funding continue to play an active public role. One youth participated in the "First Impressions" program; 3 adults and 3 youth participated in the Advancing Rural Wisconsin State Policy Forum. This group is organizing a youth-adult forum on community needs of youth and families.

Kenosha County: The Youth as Resources program completed its first granting cycle by evaluating proposals and issuing funds to three youth groups.

LaCrosse County: The Youth Commission is a network involving four youth from each of the county's nine schools who led two major projects during 2005:

- Sponsoring planning and carrying out the 5th annual Martin Luther King Day teach-in for more than 500 eighth graders from 8 county schools.
- Upgrading, staffing, and providing input into policies for a LaCrosse teen drop-in center.

Lincoln County: With an equal number of youth and adults on the Jr. Dairy Committee, the number of controversies around the Jr. Dairy show and program have been greatly reduced, and this activity seems to be returning to a positive youth development experience. The Lincoln County Fair Board had considered eliminating the 4-H fair due to controversies occurring year after year.

As a result of youth-adult partnerships on the After the Bell Steering Committee, a strong after school program for middle school youth was implemented.

Marathon County: Junior Fair Board members are half youth and half adult. Youth are the officers and lead discussions on policy and rule changes. In February 2005, youth officers led a public ethics protocol and procedures forum in the UW-Marathon Auditorium.

Marinette County: Teens in the Healthy Youth Coalition outnumber the adults about two to one with nearly 40 teens serving as co-officers, on committees, doing a number of community services and the Drama Troupe. Teens are the driving force and adults serve as advisors.

Oneida County: Five Rhinelander High School students each conducted a nominal group process on health issues for 12 to 15 middle school students representing Rhinelander and the Three Lakes School District. This group process identified as priorities healthier school lunches and more after school activities for area youth. The school board has adopted the students' initial plan.

Portage County: The Youth Action Committee (YAC) sponsored activities that led to 600 volunteer hours of service. To help strengthen this youth-adult partnership, the county 4-H youth development educator trained 37 youth members of YAC with adults from organizations that provide volunteer positions for youth. Some of these youth trained reported they had never before had an opportunity to share their views with adults.

Shawano County: County 4-H Skate Team members continued fund-raising activities under adult volunteer leadership throughout 2005. Since 2003, this club has raised $25,000 toward construction of a permanent skateboard park for youth.

Waupaca County: New London students, school personnel and community members planned a community visioning process. The first meeting involved 50 community members in a visioning session with small groups facilitated by youth and adults. Youth are preparing a presentation to key community groups with an invitation for their participation in strategy development and implementation.

3. Civic Development: Youth become informed and thoughtful citizens.

Winnebago County: Sixteen 4-H youth leaders and 3 4-H alumni completed the project *Learning about Local Government* by interviewing 15 of 38 Winnebago County Board Supervisors. Participants created a display board about their supervisor, and wrote articles for 4-H newsletters. Participants completing a follow-up survey reported increases in:

- Having a voice in local government.
- Having the skills to be an active citizen.

4. Positive Youth Development: Youth learn the skills of active citizenship such as understanding how decisions are made and how to organize, plan, and communicate.

Central District: 4-H Leader Boards from 10 counties participated in a year-long process of self-assessment, attended a district youth-adult training, and created plans to improve youth/adult partnerships. Evaluations from youth and adult volunteers indicated substantial improvement in communication, youth involvement, and youth voice in program decisions in 7 of the 10 counties.

Green Lake County: The first annual Green Lake County 4-H Youth Adult Partnership Retreat, "Growing Together" was held on June 17-18 at the Green Lake Conference Center. Fifteen 4-H youth and adult leaders benefited from activities that promoted shared decision-making. The retreat also included a visit from an adult and youth from the Marathon County 4-H Leader's Board.

Rusk County: The Rusk County Youth Development Partnership Council worked with UW-Extension to put on a Youth Voices in Community Action and Governance Day. The youth learned about local governing bodies, how these bodies would like issues presented to them, and how to present an issue and develop an action plan.

Washington County: Ten youth completed an 11-hour training through the Youth Leadership Academy, involving UW-Washington County and community collaborators. As a result, each youth worked in a team to develop a community service project that could be implemented in the club, community or school.

Key Themes: Children, Youth and Families at Risk, Communication Skills, Education, Workforce Preparation; Other: Under-Served and Under-Represented Populations

Peer mentoring and community support help youth at risk develop skills and work toward a positive future

Situation

Young people face many of life's most important decisions in the transition years between high school and the working world. Unfortunately, few students are aware of their education and employment options. They follow meandering career paths, basing decisions on scant information. In a 2003 Kenosha County UW-Extension needs assessment, residents ranked employment as a top concern.

Inputs

With UW-Extension cross-divisional funding, Kenosha County family living educator Tedi Winnett initiated the Youth Quest Mentoring Program in 2004. Winnett began with a community partnership from business, government, education and non-profit sectors — the Kenosha Unified School District (KUSD), UW-Parkside Minority Precollege Program, Racine/Kenosha Urban League, League of United Latin American Citizens, Focus Manufacturing Group and Kenosha County UW-Extension. Snap-On Tools provided mentors.

Kenosha County UW-Extension provided staff and curriculum to implement the program and served as the fiscal agent. Kenosha Unified School District helped recruit students and provided information on student achievement. KUSD schools also served as host sites. UW-Parkside supported referrals to their Pre-college program for tutoring and academic testing preparation, and for college visits. Other partners provided mentors, professional speakers and job-shadowing experiences.

The Youth Quest pilot phase developed to improve academic performance through career interest and aptitude assessment, academic skills building, tutoring and positive adult mentoring. Participants were trained in work ethics and leadership development and introduced to college and university opportunities relevant to their career goals. Consortium members met to review the program and discuss mentor recruitment and support, as well as how to support and engage student participants.

Outputs

In the pilot program, 17 students participated at 2 sites, the Urban Outreach Center and Lakeview Technical Academy. The Urban Outreach Center is near two of the targeted low-income neighborhoods, Lincoln and Columbus. Initial participants were 26 percent Latino/a, 27 percent African-American, and 47% White.

In 2005, UW-Extension Youth & Family Educator John de Montmollin, and Logan Booth, Youth Quest program Coordinator, created a program specifically designed to prepare young people for their futures by asking participants to answer three critical questions:

1. "Should you go on for additional skill, education and/or training after high school?

The revised Youth Quest program outlines the advantages and disadvantages of seeking further education after high school, and uses real life examples to show young people the importance of gaining additional skills, education and training.

2. What do you want to be?

Unlike other programs, Youth Quest helps participants explore careers they may like and are good at, and goes further by focusing on projected demand for those particular careers.

3. Where do you want to go to receive additional skill, education and training?

Youth Quest provides participants with resources to make informed decisions about their next move by considering many options. Participants explore both public and private colleges, universities and technical schools.

From the pilot project, county educators learned that traditional mentor recruitment would leave some students of color on their own rather than connecting with an adult mentor working in their chosen field. So instead, the educators now teach youth to build support networks to connect with mentors — a life skill that will be even more valuable once they are on their own.

At the Lake View Technology Academy Youth Quest site, 25 students work through the curriculum that guides them on a customized path to post-secondary education and a satisfying career. This model for Youth Quest can be replicated at other sites. A website provides Youth Quest resources and program materials for parents of high school students: http://www.youthquestwi.org/.

Impacts

Participants in the pilot phase talked about using basic interviewing skills they learned to obtain local jobs. Students also gained practical skills to conduct on-line research about careers and the training and secondary education programs that specialize in varied career interests. They speak more freely, and describe their career goals more specifically.

Participants come away from this program with a better understanding of themselves, and how their interests and skills connect to their career choices. While difficult to quantify, participants are motivated to pursue specific training programs after high school. The 2005 Youth Quest program participants wrote the following about their experience:

> “I learned how to pick a career.”
>
> “I learned what careers are best for me. Also, I know where to go to learn about careers.”
>
> “I learned more about my personality and what jobs would best suit me. I also learned that to find a good job you have to pick something that you're good at, something you love, and something that is in demand.”
>
> “Before Youth Quest I never really took the time to look at what I'm going to do after high school. Youth Quest gave me that opportunity." [I learned to] "Always have a plan and look at all of my possibilities.”

CYFAR Starting Point Pre-College Program: Led by county UW-Extension educator Mary Krause Thiry, the Milwaukee CYFAR Team (Children, Youth and Families at Risk) emphasizes the importance for youth of color to earn a college degree. Some central city schools place no emphasis on what their students need to get into college such as the required grade point average (GPA), school credits, courses completed, etc. The CYFAR Starting Point Pre-College Program meets the needs of all at-risk college bound students. A four-year curriculum guides low-income at-risk middle and high school students to select and enter the college of their choice. Two CYFAR Team members were part of AmeriCorps*VISTA, Wisconsin Campus Compact, whose mission is to strengthen civic engagement and service-learning partnerships between Wisconsin's post-secondary institutions and the communities they serve. They were charged with the task of connecting Milwaukee area universities to local community organizations and schools through service learning projects — reinforcing the material taught in the classroom, while meeting real community needs.

Program impacts: Service learning engages students in organized service, builds partnerships between the university and the community, fosters civic responsibility and enhances academics. “CYFAR has allowed us to focus our expertise on Milwaukee’s youth of extreme poverty,” Thiry reports.

CYFAR peer leaders mentor Hmong newcomers: In 2005, the CYFAR-funded after-school and summer club programs continued in Wausau under the direction of Jean Berger, Marathon County 4-H youth development agent, in partnership with Linda Bentz, Marathon County 4-H coordinator, Jennifer Damrow and Xa Yang, CYFAR Youth Program Assistants. The after-school program met at John Muir and Horace Mann middle schools. During the second semester of the 2004-2005 school year, 32 youth — 10 Asian American, 22 White; 22 female, 10 male— participated in the program. During first semester 2005-2006, a new group of 32 youth participated after school — 13 Asian American, 19 white; 24 female, 8 male.

Program impacts: These middle school youth learned leadership skills through actual practice as peer leaders teaching projects to other youth after school.

In summer 2005, 6 youth continued teaching and leading Elementary age youth in the 4-H summer clubs. Several Asian American students were key to summer program success, because Hmong youth who had recently immigrated from Refugee Camps in Thailand were participating in summer clubs. The newcomers had little English-speaking skills and were not familiar with Wausau neighborhoods, schools, or other community assets. Hmong Middle school youth helped interpret the language and worked with younger newcomers one-on-one to help them feel comfortable in 4-H and in their new communities. They helped them play group games, finish projects, take exhibits to the fair, and become part of the group. The middle school youth gained the pride that comes from helping others and learned what it feels like to be a mentor to others. They took their leadership roles very seriously and were both prompt and eager in their attendance.

Evaluation of the success of multi-state and joint activities

Key Themes: Leadership Development, Youth Development / 4-H

National Youth in Governance Initiative report will focus on how states can promote youth-adult partnerships

Two Wisconsin 4-H Youth Development staff have been a part of the national Youth In Governance development effort — one serving on the national steering committee, and the other on the research and evaluation team. In 2004, Wisconsin participants helped develop a national strategy. Through a partnership with Cornell University Cooperative Extension, the national research and evaluation team and Wisconsin 4-H youth development specialist Shep Zeldin completed a resource kit titled *Youth and Adult Leaders for Program Excellence: A practical guide for program assessment and action planning.* By the end of 2005, the kit had been selected the curriculum of the national Youth in Governance Initiative, and had been purchased through Cornell by 25 state 4-H offices and 85 other organizations. The kit can be found at: http://www.actforyouth.net

Evaluation plan: Wisconsin 4-H youth development state specialist Shep Zeldin serves as program evaluator of the national Youth in Governance Initiative. In 2005, the evaluation team made site visits to collect data in each participating state— Arizona, California, Missouri, Montana, and Wisconsin. Using these data, the team is preparing a report, focusing on how extension can promote youth in governance at the state level.

Outreach scholarship: Research on these activities has been published in three national journals.

O'Connor, Cailin, and Shepherd Zeldin. Program Assessment and Improvement through Youth-Adult partnership: The YALPE Resource Kit. Journal of Extension. October 2005, Vol 43, No. 5: http://www.joe.org/joe/2005october/tt4.shtml

Zeldin, S., Camino, L, & Mook, C. (2005). The adoption of innovation in youth organizations: Creating the conditions for youth-adult partnerships. *Journal of Community Psychology*, 33(1), 121-135

Zeldin, S., & Petrokubi, J. (2005). Understanding innovation: Youth-adult partnerships in decision making. *The Prevention Researcher*, 13, 1, pp. 11-15:

FY 2005 participation: Matthew C. Calvert 0.02 fte, Greg Hutchins 0.02 fte

Goal 5

Evidence: Campus and county-based faculty and staff report their work against desired outcomes through Cooperative Extension's Planning and Results System (PRS). They also submit more detailed success stories of their work for the PRS database. The FY 2005 4-H animal care program evaluation report is available at: http://www.uwex.edu/ces/pdande/evaluation/pdf/animalscience.pdf

2. Stakeholder Input Process

Wisconsin stakeholder input process

1. Actions taken to seek stakeholder input and encourage their participation:

Multiple approaches to seek stakeholder input include formal surveys, focus groups, key informants, advisory councils (collaborating groups, agencies, schools, service providers, and organizations) and combinations of these approaches. Efforts are made to ensure stakeholders represent the whole community in terms of diversity, geographic location, family status, income level, age, gender, disability, and both users and nonusers of UW-Extension educational programs.

2. Process used to identify individuals and groups who are stakeholders and to collect input from them:

A ninety-four page booklet "Guidelines for Program Priority Setting," an eighty-six page booklet "Trends Analysis," and a video tape "Planning for Our Future" were developed by a statewide committee of county-based faculty/staff and campus faculty with research and extension appointments. The materials were used to train Cooperative Extension county-based faculty/staff and campus-based faculty with research and extension appointments. The materials were also used with county government oversight committees and advisory committees to help them better understand the importance of seeking a broad base of stakeholder input at the community level. The materials were distributed in print form and are also available on the UW-Extension Cooperative Extension Program Development and Evaluation – Program Planning website: http://www.uwex.edu/ces/pdande/planning/index.html.

3. How was collected input considered?

Input from the local stakeholders was used to identify local issues and concerns. The local issues and concerns were gathered on a statewide basis and made available for review by all county-based faculty/staff and campus-based staff with research and extension appointments. The information is available in the Cooperative Extension Planning and Results System at the following URL: http://www.uwex.edu/ces/prs/.

The county "issues and concerns" and the "Trends Analysis" document noted above served as the foundation for the creation of programming teams made up of county-based faculty/staff and campus-based staff with research and extension appointments. The teams prepared a plan of work that identified resources that were available or would be developed by the teams. The teams are identified at the following URL: http://www.uwex.edu/ces/techservices/prs/.

Team plans of work and resources are dynamic documents that change and evolve as additional stakeholder input is gathered. At the county level, stakeholder-identified "issues and concerns, statewide team plans of work and resources serve as the basis for identifying specific county educational needs and priorities. These priorities are adapted as additional county stakeholder input is received.

Stakeholder input is sought formally and rigorously every 4 years at both county and state levels. Stakeholder input is also gathered continually, using many of the approaches identified in item 1 above. The continuous input is analyzed at the county level and provided to the statewide self-directed teams via each team's web site. Additional input is also provided via participation in team meetings, seminars, audio conferences, and newsletters. Stakeholder input continuously shapes the plans of work and the program priorities of county-based faculty/staff and campus-based faculty with research and extension appointments.

The stakeholder input process is very helpful in refocusing and reaffirming priorities on an ongoing basis. The process is also critical in identifying emerging issues. However, some stakeholder groups have had difficulty seeing beyond the critical issues they face today. As a consequence, the "Trends Analysis" document prepared by county-based faculty/staff and campus-based faculty with research and extension appointments has been very important in helping stakeholders see beyond their immediate crisis and strategically plan for the future.

3. Program review process: Merit review

Wisconsin's Cooperative Extension has made no significant change in merit review since the 5-Year Plan of work that now extends through 2006.

4. Evaluation of the success of multi-state and joint activities

This information is reported under each national program Goal.

5. Expenditures for multi-state extension and integrated activities

Attachment D

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 **X Final**
Institution: UW-Extension
State: Wisconsin

	Integrated Activities (Hatch)	%	Multistate Extension Activities (Smith-Lever)	%	Integrated Activities (Smith-Lever)	%
Established Target %		%		%		%
This FY Allocation (from 1088)			$7,827,020		$7,827,020	
This FY Target Amount			$156,540		$391,351	
Title of Planned Program Activity						
Goal 1			$183,395		$500,000	
Goal 2			$50,206			
Goal 3			$87,667			
Goal 4			$136,641			
Goal 5			$34,460			
Total			$492,369		$500,000	
Carryover			0		0	

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

Arlen Leholm — April 28, 2006

Director **Date**