Report to Iowa Senators and Representatives
IN THE UNITED STATES CONGRESS
FROM IOWA CARET REPRESENTATIVES AND
IOWA STATE UNIVERSITY
Agriculture is the centerpiece of Iowa’s economy and society. The future of the state depends on a strong agricultural economy. Iowa State University is a committed resource for Iowa’s future. Through research, extension and teaching in agriculture, Iowa State is becoming the best at fulfilling the mission of the land-grant university.

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WHAT IS CARET?

The Council for Agricultural Research, Extension and Teaching (CARET) is a national grassroots organization created in 1982 by the Division of Agriculture, which is part of the National Association of State Universities and Land-Grant Colleges, or NASULGC. CARET’s mission is to enhance national support and understanding of the land-grant university system’s food and agricultural research, extension and teaching programs to achieve a better standard of living for all people. CARET delegates are chosen by land-grant universities to be representatives of their states’ land-grant programs.
NUTRIENT MANAGEMENT PLANS EASIER WITH ISU PROGRAM
An Iowa State educational program makes it easier for U.S. livestock producers to get professional assistance when developing comprehensive nutrient management plans. The plans must be prepared either by USDA employees or a certified third-party technical service provider. Robert Burns, associate professor of agricultural and biosystems engineering, developed and leads the technical service provider certification program.

SOYBEAN RUST MANAGEMENT STUDIED IN ORGANIC PRODUCTION
Iowa State, Michigan State University, University of Florida and the Rodale Institute have received $480,000 from the USDA to evaluate strategies for management of soybean rust in organic systems. Strategies will include extended crop rotations and windbreaks to mitigate spore dispersal, organic-compliant fungicides and biological controls.

NEW TECHNOLOGY TO PREDICT CROP DISEASE SPREAD
A team of researchers is developing a web-based system to detect, identify, map and predict the spread of plant pathogens and pests. The USDA is providing a three-year $900,000 grant for the work, which will first focus on Asian soybean rust. The team will develop real-time disease/pest risk maps using the National Plant Diagnostic Network’s database of nationwide plant disease clinic samples to track diseases and pests. Atmospheric transport models will predict the time and distance pathogen spores could be disseminated beyond the point where the disease is found. In the case of Asian soybean rust it will provide information to growers so they can apply fungicides at the ideal time.

BRANDED BEEF PROJECT TIED TO IOWA LANDMARK
Iowa’s reputation as a producer of high-quality beef is the basis for a demonstration project to develop a brand linked to that reputation. Iowa-80 Beef was chosen as the brand name for the project because members of Japan’s beef industry often refer to corn-fed U.S. beef as “I-80 beef” and Interstate 80 is a landmark where beef is produced using rations based on corn or corn co-products. The Iowa Beef Center and the Center for Agricultural and Rural Development are collaborating on the project.

MEAT QUALITY GENE MARKERS IMPROVING IOWA’S LARGEST INDUSTRY
Iowa produces nearly 25 percent of the more than 100 million pigs grown annually in the United States. To be competitive, high quality pork must be produced efficiently to meet consumers demand. A U.S. patent was issued last summer to Max Rothschild and his colleagues in the Department of Animal Science that covers the use of a genetic marker to improve meat quality. This technology and other recently discovered meat quality markers allow producers to grow better pigs.
IOWA’S WINE INDUSTRY POURS ON THE GROWTH

Iowa’s grape and wine industry has grown dramatically over the last five years. There were 13 wineries and five wine-grape vineyards in Iowa in 1999. Today, Iowa boasts 44 licensed wineries and more than 275 vineyards. Mike White, ISU crops/viticulture specialist has provided direct technical assistance to 27 Iowa wineries and 180 of these vineyards during the last fiscal year. One example of this new economic activity is the 84-member Iowa Wine Cooperative, based in Osceola. ISU Extension’s Value Added Agriculture Program also provided the cooperative with a business feasibility study and business plan. Based on the information provided, the cooperative raised more than $1 million in equity through the sale of shares and state and federal grants to build a new winery. The winery plans to produce 20,000-plus gallons of wine annually.

INITIATIVE TARGETS IOWA’S CORN, SOYBEAN GROWERS

The Corn and Soybean Initiative is a one-year-old effort at Iowa State to better serve the needs of Iowa’s number-one-in-the-nation corn and soybean growers who produce crops worth an estimated $7 million. The initiative is helping integrate Iowa State’s applied research and extension programs and expertise in corn and soybean production with a goal of increasing Iowa growers’ productivity and global competitiveness. The initiative is a partnership of ISU faculty and staff, extension field crop specialists and agribusinesses, retailers, commodity organizations, farm media and others to maximize opportunities to reach growers with research, extension and educational resources. In its first year, the program has attracted 26 retail partners at 236 locations in 84 Iowa counties.

AIR EMISSIONS LAB HOG STUDY REDUCES AMMONIA PRODUCTION

The Air Emissions Laboratory at Iowa State studies the effect of diet on air emissions, among other air quality issues. The first study investigated the feeding of reduced crude protein diets to grow-finish swine. Preliminary data showed that by reducing protein through the inclusion of supplemental amino acids, ammonia emissions could be reduced 20 to 45 percent compared to a typical industry diet. The reduced crude protein diets did not have an impact on weight gain or feed intake of the pigs.
ACTIVE LEARNING CONCEPT USED IN COLLEGE COURSES

Students can do a better job of absorbing information when they become active participants in the learning process. The concept is known as student-centered learning, active or cooperative learning. Jan Thompson, forestry, uses the concept in her urban forest planning and policy course. Her students, working in groups, identify current issues related to urbanization on forest land, examine underlying causes, assess pros and cons and “forecast” the future for urban-proximate forests given current patterns and processes. Students are invited to identify possible solutions, some of the likely outcomes of those solutions and how they differ from making no changes. Thompson says, “They love this exercise, and it is fun to watch them engage with their colleagues, particularly as they imagine possible futures.”

SCIENCE WITH PRACTICE — STUDENTS LEARN WHILE WORKING

A new program within the College of Agriculture gives students a chance to learn while working. It provides opportunities for students in agriculture to work with faculty and staff in research labs, teaching and research farms, greenhouses and other units. The students are paid, while they earn academic credit. Both mentor and student participants surveyed last spring said they saw student improvement in communication, time management, responsibility, organization, self-confidence, listening skills and research skills.

AG ENTREPRENEURSHIP INSTITUTE GIVES STUDENTS THE BUSINESS

The first Agricultural Entrepreneurship Institute was held in the fall of 2005. About 50 faculty, staff, students and Iowa entrepreneurs participated in the institute, which included speakers, group discussions, panels and presentation of case studies. The institute is part of the College of Agriculture’s Entrepreneurship Initiative that was established through a $1.5 million gift from Roger and Connie Underwood. Roger is a college alum who co-founded a successful business in Ames after graduating.

BIOLOGY IS NEW MAJOR IN COLLEGE OF AGRICULTURE

With the long-time biology program in the College of Liberal Arts and Sciences, the addition of the College of Agriculture program brings the total number of biology students at ISU to more than 400. The College of Agriculture major had 36 students in its first semester. “For students, the agriculture biology major can open up lots of career opportunities as well as graduate school options,” said David Acker, associate dean for academic and global programs. “Agriculture, as we know it today, is not one discipline. It is composed of a wide variety of disciplines all of which work together to improve the lives and livelihoods of our people and communities.”
INSTITUTE COORDINATES FOOD SAFETY WORK
The Institute for Food Safety and Security is dedicated to protecting Iowa’s and the nation’s vast investment in agriculture; and directly serving production, processor and consumer needs by enabling rapid identification and effective responses to food safety and security concerns that affect the global food chain. The institute was established to engage the farm-to-table spectrum of food problems and issues. Collaborators include the University of Iowa’s Colleges of Medicine and Public Health, the Iowa Department of Public Health, and the State Hygienic Laboratory and it is associated with the USDA’s National Animal Disease Center and National Veterinary Services Laboratories.

TRAINING FOOD HANDLERS HELPS KEEP IOWANS HEALTHY
ISU Extension’s ServSafe program has trained more than 2,000 food service workers on how to prepare meals that are safe for customers. The program is cosponsored by the Iowa Restaurant Association and is available for restaurants, assisted living facilities and school districts. Extension also offers SuperSafeMark, a similar certification program for grocery and convenience stores.

MEAT INDUSTRY WORKERS LEARNING FOOD SAFETY
In Southeast Iowa, extension is using a $600,000 federal grant to train meat plant employees in food safety techniques. The program also is helping producers, animal transporters and meat plant animal handlers to implement animal handling and quality assurance practices. West Liberty and Mount Pleasant Foods are partners in the employee-training program. The program is being adapted for other processing plants in Southeast Iowa.

TIPS OFFERED FOR FARMERS IN DIRECT MARKETS
Farmers who sell fruits and vegetables directly to consumers, restaurants and food services — some of the most rapidly expanding niche markets for growers — have a new resource from Iowa State. Three new publications outline on-farm food safety practices and how to document them, provide information about cleaners and sanitizers and offer tips for seasonal and part-time employees who handle the produce. The fact sheets were developed by ISU Extension with a grant from the Marketing and Food Systems Initiative of the Leopold Center for Sustainable Agriculture.
Most undergraduate and graduate students enrolled at Iowa State come from Iowa. Total enrollment was 25,741.

The Council for Agricultural Research, Extension, and Teaching includes employment on farms; agricultural services, forestry, fishing, etc.; farm machinery and equipment dealers; farm supply wholesalers; wholesale farm commodity marketers; farm machinery/equipment manufacturers; ag chemical and fertilizer manufacturers; food processing manufacturers; wholesale food distributors; grocers and other food stores; restaurants and other eating establishments.

ISU Extension serves families, producers and businesses throughout Iowa. One example is the numbers shown here of rural and urban youth who participate in 4-H.

Iowa State has more than 175,000 alumni around the world, and about 15,600 College of Agriculture alumni living in Iowa. About 66 percent of College of Agriculture graduates stay in Iowa for their first jobs.

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|                        | 2,506 | 2,160 | 4,036 | 6,252 | 3,336 | 18,290      |
|                        | 27,328| 22,869| 13,960| 25,396| 37,756| 127,309     |
|                        | 7,725 | 9,692 | 22,278| 26,624| 9,164 | 75,483      |
GRAZING ALTERNATIVES IMPROVE WATER QUALITY

A team of Iowa State scientists evaluated livestock grazing practices to improve the water quality of Iowa’s farm streams. Researchers in animal science and the natural resource ecology and management departments teamed with a National Soil Tilth Laboratory scientist, to determine how cattle grazing management practices may reduce erosion and phosphorus and sediment levels in pasture creeks. They found that losses of phosphorus from pastures can be controlled through rotational grazing practices that leave sufficient forage residue. And avoiding streambank grazing during certain periods of the year, such as late spring, would reduce losses of sediment and phosphorus.

NEW ECONOMIC TOOL ASSESSES WATER POLICIES

Researchers at the Center for Agricultural and Rural Development have developed a method for better assessing the costs and benefits of a range of conservation practices in agriculture to mitigate water pollution. The Soil and Water Assessment Tool predicts stream flow, sediment and nutrient loads (phosphorous and nitrogen) for 13 watersheds in Iowa based on selected conservation practices. Using this combination of models and data, the researchers were able to test the effects of such practices as grassed waterways, terracing, contouring, conservation tillage, land set-asides (such the Conservation Reserve Program), and nutrient management strategies. The conservation practices are estimated to be costly but provide significant reductions in water pollution from agricultural runoff.

ISU PROVIDES ASSISTANCE FOR CATTLE PRODUCERS

Several programs are available through Iowa State to help producers protect ground and surface water quality near their cattle operations. One provides assistance in developing an Environmental Management System, which helps cattle producers identify strengths and weaknesses in their operations. Producers can contact their county extension office to get connected with a livestock specialist or ag engineer who can help with an initial assessment and provide technical assistance on feedlot design and manure management. Technical assistance and cost-sharing funds are available through the Natural Resources Conservation Service.
BIOECONOMY INITIATIVE OFF AND RUNNING
The university-wide BioEconomy Initiative seeks to develop technologies for converting crops and plant materials into chemicals, fuels, fibers and energy. Several College of Agriculture faculty members are affiliated with the initiative. Steven Fales, former agronomy department chair, serves full-time as the College’s Bioeconomy Initiative coordinator. Faculty experts from Iowa’s public universities in January presented a seminar on renewable fuels to the Iowa General Assembly. Lawmakers requested science-based information on ethanol, biodiesel and other bio-based alternative fuels. Last year Iowa State hosted the Biobased Industry Outlook Conference to provide information for those interested in business opportunities in the areas of renewable energy and biobased products.

STUDY ANALYZES FACTORS BEHIND COUNTY GROWTH
Rural amenities, state and local tax burdens, population, amount of primary agriculture activity and demographics have the largest impact on county economic growth, according to new research from the Center for Agricultural and Rural Development. The study found that counties with a heavy agricultural presence have not fared as well as less agriculturally dependent counties, although counties that increased their value-added agriculture (measured as growth in livestock sales receipts) enjoyed additional economic growth. Also, increased livestock production must be weighed against availability of recreational amenities, which are a significant growth factor and may become even more important as the demand for outdoor recreation increases with growing incomes, leisure time and population.

FARM COOPERATIVE AIDS SOY ADHESIVES DEVELOPMENT
Iowa State researchers and West Central Cooperative in Ralston seek to establish an infrastructure to provide modified soy proteins for industrial use. The project focuses on using a new technology developed at Iowa State to produce environmentally friendly soy protein-based adhesives. However, commercialization of the technology and adoption by adhesive and wood-product manufacturers has been slow. This prompted ISU researchers to extend their technology-transfer efforts to smaller protein suppliers with proven track records for developing value-added products for markets of less interest to larger suppliers. This led them to West Central Cooperative, which makes bio-products (bio-diesel, lubricants, paint removers) from soybean oil, and has a strong interest in value-added technologies and biobased products from renewable resources.
**FAT NOT ALL BAD, ESPECIALLY WITH VEGGIES**

Eating salad and vegetables with some fat promotes the absorption of lycopene, alpha- and beta-carotenes, all of which aid in the fight against cancer and heart disease, a study at Iowa State found. Eating a salad with fat-free dressing or eating a handful of carrot sticks without an accompanying ranch dressing or dip deprives your body of these beneficial substances. Essentially no beta carotene absorption was observed when salads with fat-free dressing were eaten. A significantly greater absorption of lycopene, alpha- and beta-carotene was recorded when salads were eaten with full-fat dressings rather than with reduced-fat dressings. Researchers aren’t recommending a high-fat diet, or using full-fat salad dressing. But those using fat-free dressing may want to add small amounts of avocado or cheese to their salad to aid absorption.

**EXTENSION HELPS FAMILIES EAT BETTER**

ISU Extension provides research-based information to help families make decisions that improve and transform their lives. Last year 67,200 Iowans participated in nutrition education programs, and 89 percent of those surveyed reported a health related behavior change. Informed food choices combined with increased physical activity are essential for a healthy, productive work force.

**CATTLE FEEDING METHODS IMPROVE BEEF AND MILK**

Recent field research has shown that pastured cows produce more healthful products than those finished on conserved forages. Iowa State researchers documented the concentrations of conjugated linoleic acid (CLA) in beef and milk from farms in northeast Iowa and southwest Wisconsin. CLA is a fatty acid thought to help prevent cancer, diabetes and obesity. Beef and milk are two of the main sources of CLA in the human diet. The study involved four beef and 12 dairy farms. Cattle that were grazed had from 0.34 to 0.46 percent CLA. The cattle that were only fed conserved forages had from 0.23 to 0.33 percent CLA. Among the dairy farms, the average concentrations of CLA over the course of the study were 0.35 percent in Iowa and 0.27 percent in Wisconsin.
Federal support has a significant impact on the success of Iowa State University's agricultural research and extension programs. In this report, you have read about specific examples.

Federal formula funds (Hatch, Hatch Multistate, McIntire-Stennis and Section 1433 Animal Health) play a crucial role in supporting these programs. Studies by Iowa State University and Yale University economists found that the benefits of federal support for agricultural research have meant an approximate 50 percent annual rate of return to society.

This formula for success depends on a nationwide partnership of university and federal scientists and extension specialists. It really works. Cooperation and responsiveness are what it's all about.

For ISU agricultural research (the Experiment Station), federal formula funds make up approximately 5 percent of its funding. For extension, federal formula funds make up 12 percent of ISU Extension's funding resources.

Federal formula funds are grounded in the recognition that, more than any other area of science, agricultural research is site-specific. Formula funds have been a key part of allowing states to be responsive in meeting local and regional needs. At the same time, the land-grant and federal partnership is the mechanism to work together to address critical issues for the common good of our nation. These issues in agricultural, food and the life sciences include:

- protecting America’s food supply from natural threats and bioterrorism activity
- increasing the “nutritional literacy” of young people
- conserving environmental health and quality
- strengthening communities through economic development
ACADEMIC DEPARTMENTS
• Agricultural & Biosystems Engineering
• Agricultural Education & Studies
• Agronomy
• Animal Science
• Biochemistry, Biophysics & Molecular Biology
• Ecology, Evolution & Organismal Biology
• Economics
• Entomology
• Food Science & Human Nutrition
• Genetics, Development & Cell Biology
• Horticulture
• Natural Resource Ecology & Management
• Plant Pathology
• Sociology
• Statistics

CENTERS AND INSTITUTES
• Agricultural Marketing Resource Center
• Beginning Farmer Center
• Biosafety Institute for Genetically Modified Agricultural Products
• Center for Crops Utilization Research (CCUR)
• Center for Agricultural and Rural Development (CARD)
• Midwest Agribusiness Trade Research and Information Center (MATRIC)
• Food and Agricultural Policy Research Institute (FAPRI)
• Center for Integrated Animal Genomics
• Center for International Agricultural Finance
• Center for Sustainable Rural Livelihoods
• Community Vitality Center
• Food Safety Consortium
• Iowa Beef Center
• Iowa Pork Industry Center
• Institute for Food Safety and Security
• Leopold Center for Sustainable Agriculture
• Plant Sciences Institute*
• Seed Science Center

REGIONAL CENTERS
• North Central Regional Aquaculture Center
• North Central Regional Center for Rural Development
• North Central Regional Plant Introduction Station
• Rural Policy Research Institute (RUPRI)

ISU EXTENSION PROGRAMS
• Agriculture and Natural Resources
• Center For Industrial Research and Service
• Communities
• Continuing Education and Communication Services
• Families
• 4-H Youth Development

Iowa State University